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Students as choice-makers: developing altered consciousness as an aspect of design and global citizenship literacy

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Abstract: *Choice, as an aspect of existence, may be taken for granted or it may not exist at all. Choice may be complex, simple, false, or not apparent. Choices can be quantitatively and qualitatively different. There are ironies of choice in that profusion of choice can mean confusion of choice. Equally, and perversely, those who have choices can also enjoy the privilege of not choosing – itself a choice. Design is a site of choice-making – not only within the nuances of design processes but also for the role it plays in identity formation, social being, politics, and global interactions. This paper aims to address the significance of choice not only for focussed design and technology education but also for the general education of all students in their preparations to become fulfilled and engaged global citizens. The paper: a) explores choice from philosophical, social, political and consumerist perspectives; b) presents the student as both person and player in, and on, the world; c) offers two illustrations of curricula considered supportive of choice education for design and citizenship literacy; and, d) discusses ‘pedagogies of choice’ which can contribute to the growth of ‘altered consciousness’ through design education.*

Keywords: *Choice, choice education, altered consciousness, design literacy, curriculum, citizenship, design and technology education.*

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Introduction

Choice, as an aspect of existence, may be taken for granted by some while for others it may not exist at all. Where it occurs choice may be complex, simple, false, or not apparent. Choices can be quantitatively and qualitatively different. There are ironies of choice in that profusion of choice may mean confusion of choice. Equally, those who have choices can also, perversely, enjoy the privilege of not choosing. Thus, one may have a choice by right but one may also have a responsibility to choose. Ultimately, values are at the core of much choice-making. Given such considerations, education about choice matters and such an education can be well articulated as a component of design literacy. In turn, design literacy can be a key partner to citizenship literacy.

This paper aims to draw attention to the significance of choice not only for good practice in focussed Design and Technology education but also for the general education of all students in their preparations to become fulfilled and engaged global citizens. The paper opens with a discussion of the concept of choice, the several ways in which it can be understood, and the kinds of contexts in which it can be found. The student is then presented as both person and player in, and on, the world.

We then take two examples of curriculum policy – those of Scotland and South Australia – as illustrations: of the kind of curriculum that enables, rather than inhibits, choice education; of how choice can be richly present in design curricula; and, of how, in turn, choice as a component of design literacy can simultaneously contribute to general education. We then develop a discussion of what we call ‘pedagogies of choice’ which can contribute to the growth of ‘altered consciousness’ intended both to enhance students’ engagement with design, with current issues, and to strengthen their capacities to shape preferred futures.

The concept and contexts of choice

There are several ways that the concept of choice can be considered, from the everyday to the philosophical and the political. In an everyday sense to choose might simply mean to pick or to select. A choice may be from one of a set of possibilities – for example: of foods; of ideas; or of actions - thus, respectively, an apple, a birthday gift, or a means of travel. To have a choice implies ‘more than one’ and we may apply a hierarchy – first choice, second choice, etc. Faced with abundance we can be ‘spoiled for choice’ or enjoy choice as a luxury. Conversely, there may ‘no choice’ when we react instinctively to avoid danger or when Henry Ford offers us ‘any colour so long as it’s black’.

There can be situational differences too. Picking a card from a pack of cards is different from picking from a variety fruits. Within such choice-ranges there could be quantitative and/or qualitative factors to consider. When we can’t see the cards yet we can see the range of fruit, the *kind* of choice differs. Whether we are the only chooser or for what purpose we are choosing can also affect our choice-making. We may even choose not to choose.

Choosing what to wear may be a cultural matter. When voting, one may have a narrow range of choice on the political spectrum – if any. One might ‘choose not’ to vote for candidates or to choose to vote for the ‘least worst’ candidate. In many situations, choosing amongst options may be limited by our imagination, our finances or the availability of appropriate knowledge.

In this last case we talk of making an 'informed choice' and Weatherford (1995) discriminates between choosing and deciding when he suggests that a choice can occur without deliberation whereas a decision calls for it. Thus, when we consider a complex concept such as design literacy we engage with multiple aspects and possibilities related to choice. Design literacy is (hopefully) about *reasoned* choice-making at multiple levels and stages – from concept to consumption.

Thomson (1999), in her discussion of decision-making, points out that being clear about what choices or options are available is one thing but that there is also a need to work out the implications or *consequences* of such choices. One may need more information to support decision-making and, ultimately, one is *evaluating options* to assess the most preferable. Thomson thus identifies four important components of decision-making – options (choices), information, consequences and evaluation (Thomson (1999, 92). Clearly choices do not happen in isolation of values and the weighing of competing values amounts to a kind of ethical decision-making – a case of: 'What is the *right* choice?'

From what has been said so far, there is both a knowledge dimension and a values dimension when choice is under consideration.

In the consuming world...

While everyone has choice in their lives the reality is that, globally, there are huge differentials in the number and nature of choices available to people. In a materially rich minority world relative wealth expands choice-making possibilities. For these people, not only are the necessities of life well met but there is abundance of choice. As Hamilton and Denniss (2005) put it:

The explosion of choice serves a crucial function: it spreads affluenza. It does this by creating desires, intensifying the feeling of deprivation, and hastening obsolescence. People suffering from affluenza do not know what they want, yet want everything. More choice helps create new desires by highlighting the range of products consumers could have.

(Hamilton and Denniss 2005, p.40-41)

Here the ironies of choice begin to emerge where, within the economic model, consumer choice is avowed as a virtue or is even positioned as some kind of democratic right in the name of 'market choice'. In the mass market, whilst the *quantity* of choices is increased, the *qualitative differences*, within the range of choice, narrows. There are potentially hundreds of toothbrushes to choose from when all do basically the same job. With more complex products such as insurance, internet provision, energy supply and airline travel not only are the offerings fewer but the qualitative product differences are nuanced and difficult to arbitrate. In the world of confusion marketing, similarities are disguised and minor differences are afforded undue attention. In the (designed) marketed world of confusion where illusions of choice are created, actually making a choice itself becomes confusing and consumer resignation or apathy can set in.

There is a substantial literature spanning half a century that points to how lives, communities and societies have been shaped by product-push (see e.g. Packard 1962; Schumacher 1973/1986; Whiteley 1993; Suzuki 1997; Hamilton 2004; Hamilton and Denniss 2005; Nye 2007). In the consumer society we may *perceive* a range of choices within categories of products but there are also choices *in principle* to be made – lifestyle choices. Such choices may seem difficult but they are possible.

Ethics, determinism, existence...

The powerful psychological and social perpetuation of the idea of choice at a cultural-consumerist level is something which many people are simply born to and uncritical of. However, alternatives exist where choices at a meta-level of principle are made as when the Amish assess a product's potential to enhance or erode their way of life (Kraybill 1989/2001; Sclove 1995; Nye 2007). Such questioning illustrates what Singer calls an 'ultimate choice', that is, one which exists between two fundamentally different ways of living – between ethics and self-interest. He points to two kinds of choices and these inform our discussions of design and technological choice-making: 'Ultimate choices take courage. In making restricted choices our fundamental values form a foundation on which we can stand when we choose. To make an ultimate choice we must put in question the foundations of our lives' (Singer 1995, p.5). We can juxtapose Singer's position with two questions posed by Palmer:

Do we inhabit a world already formed by technological choices so complex that many seem almost invisible (e.g. the pencil, the telephone, the washing machine)?
Do many technologies appear before us as autonomous and beyond choice (computers at work, videos at home, cars to go between them)?

(Palmer 1994,p77)

In considering both Singer and Palmer here, the philosophical concept of determinism emerges. Any framing of design and technology education directed towards good choice-making (a value-laden term, we acknowledge) must take account of this influential doctrine which challenges the idea of free will and whether we can, or have, any influence over how technologies develop. While serious scholars of technology (see e.g. Mumford 1934; Winner 1977; Smith & Marx 1995; Feenberg 2002; Ihde 2002) now largely resist technological determinism and its fellow travellers 'neutrality' and 'progress', this is not yet the case in the public realm.

Enlightenment thinking (Postman, 2000) still pervades Western culture and this is promoted strongly by advocates of the free market. Faith in progress (usually of a quantitative-instrumental kind), belief in the neutrality of technologies as tools without values, and the belief that all technological development is inevitable ('that's the way things are going') all contribute to a form of dogma and a disenfranchisement of persons. Thus, in such a regime, we might have limited, localised, personal design and technological choices but their general determination is beyond us. Determinism of this kind eschews critical thinking that questions technologies and it embeds acquiescence towards them. Individuals feel, and may be deemed, impotent to act.

However, the matter is not a simple dilemma of submission to circumstances versus assertion to enact change. Feenberg (2002) applies critical theory in his rejection of an everyday either-or of technology studies of the 'Do we follow technology or does it serve us?' type. The issue hinges around the notion of progress grounded in positivist claims of technological neutrality and determinism versus a humanity-centred argument of defence against technological dominance. Feenberg rejects this 'dilemma' and argues that '... the real issue is not technology or progress per se but the variety of possible technologies and paths of progress among which we must choose. (And, he adds) ...if alternatives do exist, the choice between them will have political implications' (Feenberg 2002.v).

Like Ihde (2002) and Sclove (1995), Feenberg points to multiple possibilities for technological options. He joins Rybczynski, (1983), Palmer (1994), Sclove, (1995), and Winner (1995), in advancing the study of our technology-politics relationships and showing how our technological and design choice-making (in free, limited, or non-existent forms) can shape the kind of society and world we create in both enabling and disabling ways. Sclove (1995) discusses technology as both enabler and disabler of democracy and points to the potency, or otherwise, of the individual in society. When such political-democratic issues are explored, matters of individual and collective choices arise about lifestyle, environment and, importantly, education.

The philosophy of existentialism is one that puts choice-making about life, self, and identity at its core. As Young puts it:

Existentialists from Kierkegaard to Sartre have proclaimed that to be fully human is to make radical choices; that is, choices that are not determined but choices for which no rationally persuasive support can be offered. Only by making such choices and eschewing all talk of excuses can we make ourselves responsible agents (Young 1993, p.537).

This foregrounding of human agency and efficacy in opposition to determinism is borne through by Franklin (1990/2004) who addresses determinism in the light of intergenerational perspectives, saying: "...our artifacts will reflect our values and choices, as artifacts have done throughout the ages" (2004,p.113). She uses history as the context to "...help expand our discourse and our social imagination. Technology is not preordained. There are choices to be made and I, for one, see no reason why our technologies could not be more participatory and less expert-driven" (2004, p.115).

Once we see that choice-making matters in so many ways: in the designed and technological world; as a core human capacity and behaviour; as key to democratic process; in fact, throughout our personal and social being, then we also see the significance of ethics to the discourses of choice.

Warnock (1998) argues that ethics implies choice and is thus apparently incompatible with determinism or, conversely, that 'choice' is illusory for determinists. She argues the centrality of ethics to life and shows that moral value cannot 'be' without a human and asserts the necessity both to value, and pass on, from one generation to the next 'the idea of ethics' through moral education (Warnock 1998,p.109). She also (1970) describes existentialists' focus on human freedom and the exercise of will (as against determinism) and how "(t)hey are all of them interested in the world considered as the environment of man (sic)...because of his power to choose his own courses of action" (Warnock 1970,p.1).

Thus, she signals our interdependence with each other, with environments, across the planet and across generations. Her argument also applies to our technological decision- and choice-making which is so much a part of these inter-relationships. As persons, humans, citizens we are players in the technological complexities of the world. It is easy to say that we are powerless and that, alone, we may not be able to alter or affect decision-making (in hindsight or with foresight) about designed technological developments and that this is really a matter for 'others'. However, in democratic life we have both a right and a duty to participate and to influence. Key to facilitating this is an educated citizenry that is able to engage with issues and questions concerning preferred futures.

The student as person and player in, and on, the world.

Students, like all people, find themselves in particular sets of life circumstances. As members of families and communities (eg local, school, sport) they play their parts and they have their lives and identities shaped. But identities are also formed by the students' interactions with the technologies (products and systems) of their worlds. However, while some interactions merely happen, others are actively engaged by young people. Students' choice-making around engagements with others and with technologies is what contributes to a student's own, conscious identity formation. At a further level, students begin to understand that they can actually accept and reject (choose) particular ways of acting in, and on, their world.

In these circumstances it becomes possible to recognise that *efficacy* is a disposition that can be appreciated and nurtured. Efficacy is one outcome of conscious choice-making especially when it overcomes passive acceptance and generates a questioning of the actions and effects of people, advertisers, products and environments alike. The self that develops in relation to others is the ethical self – the self formed by choice-awareness and by choices made. In the context of the so-called developed world being able to choose is a luxury that on the one hand students may not realise they have, while, on the other, is a privilege the majority world cannot enjoy. Increasingly, the 'designed self' and the 'chosen world for self' project multiple possibilities and beg considered responsibilities towards self, others, and the planet. Against our sketch of some of the senses of 'choice' and 'choosing', drawn from the everyday to the philosophical, we turn to the perspective of the student in the designed and technological world. Not only is the formative 'being' of students shaped by the choices made by others but it is further shaped by the choices the students themselves come to make.

We have tried to show that choice-making is a phenomenon of human existence and that it happens in multiple contexts (e.g. cultural, ethical, social, political, religious) and multiple forms (technical, aesthetic, personal, quantitative, qualitative). Further, we can engage choices or, as a choice, disengage - actively or passively. Given such a rich scenario, what are the conditions that can facilitate a rich education in, and for, choice-making through design activity? Are there ways that choice education can apply to the general education of all students and be for the benefit of society as a whole? We believe so.

Choice education for and through design literacy – two curricular illustrations

Two curriculum policy approaches – those of South Australia and of Scotland – illustrate how choice education in design and technologies can be served both through specific and through general curriculum practices. In presenting these two curriculum examples, we stress that their full richness cannot be portrayed here and we would encourage deeper exploration of them by readers interested in the ways curriculum can positively enable choice education. Both curricula are *frameworks* articulated through eight *Learning Areas*. As such, the final determination of the delivery of the curriculum is left to the professional judgement of the teachers. In Scotland, the Learning Area is 'Technologies' while in South Australia, it is 'Design and Technology'.

SOUTH AUSTRALIA

The South Australian Curriculum, Standards and Accountability Framework (SACSA) (DETE, 2001) Learning Area of Design and Technology (D&T) is articulated through three Strands – Critiquing, Designing and Making. Interweaving the whole curriculum are five Essential Learnings: Communication, Futures, Identity, Interdependence, and Thinking.

Design and Technology in this curriculum is conceptualised around a three-dimensional expression of technological literacy. The interdependent dimensions are the *operational* (learning to use and do), the *cultural* (learning through technology) and the *critical* (learning about and how to be with technology). Four of the eight aims of the D&T curriculum are:

(T)o develop in all students:

- ethical, critical, enterprising and futures dispositions towards their own and other people's designed and made products, processes and systems
- capacities to identify and critique the values underlying the intentions, design, manufacture and consequences of any technology
- capacities to consider and respond to the needs of diverse cultures in relation to developing technologies
- capacities to apply their design and technology learning to other Learning Areas, to life in the wider community, to the virtual community, and in accessing further education and training.

(DETE 2001, Band Introduction p.3)

As this is a curriculum *framework*, teachers are to develop the three strands and the essential learnings according to their own professional judgement. To support this there are outcomes (standards) given at two-year increments for the students. Common to all levels is a statement (approx. one page) on each strand. The Critiquing strand's opening paragraphs include:

Critiquing involves making judgments – not only about technologies in some passive or impersonal form but also very much about the thoughts and actions of self and others as designers, makers and users of products, processes and systems...

...(Students) interrogate: the intentions and values at the very conception of a technology; the principles used in designing; the methods and resources used in manufacture; and, impacts and consequences. Critiquing often exposes ethical, cultural and social contradictions brought about by designed products, processes and systems. Through critiquing, students deconstruct the meanings behind and power relationships between people and the built and created world. The act of critiquing ultimately involves presenting a defensible case outlining the merits or otherwise of the whole or parts of a product, process or system.

(DETE 2001, Strand: Critiquing)

Meanwhile, at its outset, the Designing strand states:

Designing is, of essence, about change and about choice-making. To design is to change one set of circumstances into another and, in doing so, choices have to

be made. The decisions faced when designing involve complexity and holistic thinking as there are many factors to consider. As students gain confidence as designers, they realise that they can personally effect change.

Designing involves *imagination and creativity* to make proposals and choices about new ideas for products, processes and systems

(DETE 2001, Strand: Designing)

Two illustrative standards are:

4.1 Critiquing: (The student) explains the decisions and choices made in designed and manufactured products, processes and systems and identifies alternative possibilities.

4.2 Designing: (The student) integrates design skills to create personal strategies for designing culturally and socially defensible products, processes and systems.

SCOTLAND

Since 2002, Scotland has been transforming the educational landscape for 3 18 year olds with an all-encompassing, inter-agency initiative, 'Curriculum for Excellence' (CfE), in which the central place of choice, decision-making and responsible citizenship becomes apparent. The overall purpose of education in Scotland aims to help children and young people develop specific personal capacities: 'successful learners', 'confident individuals', 'effective contributors' and 'responsible citizens' (Scottish Government 2004) and each Learning Area contributes towards developing these capacities. CfE is based on a model of change which allows teachers greater scope for professional decision making about how they plan, develop and present learning experiences. They are guided by a series of policy frameworks such as Building the Curriculum 3 (Scottish Government 2008) which applies these principles of curriculum design to matters of organisation and educational location:

- Challenge and enjoyment
- Breadth
- Progression
- Depth
- Personalisation and choice
- Coherence
- Relevance.

Teachers, regardless of subject specialism must also take cognisance of interweaving 'themes across learning':

- *Education for Global Citizenship* (which includes sustainable development). Teachers are to plan for experiences which encourage learners to take thoughtful and responsible action locally and globally.
- *Enterprise in Education* intends to help the learners develop skills and attitudes to cope with an unpredictable future, to be able to deal with setbacks and disappointments in a positive way, and to continue to learn for the rest of their lives. This includes problem solving, decision-making and evaluating risks.

Furthermore, there are 'responsibilities for all': Literacy, Numeracy, and Health and Wellbeing, promoting "confidence, independent thinking, and positive attitudes and

dispositions” (Scottish Government 2008). Teachers are responsible for helping learners to make informed decisions in order to improve their mental, emotional, social and physical wellbeing. Learners are entitled to a supportive learning-environment where they can reflect on their strengths and skills to help them make informed choices when planning their next steps and setting learning goals.

The ‘Technologies’ Learning Area seeks to: “(E)nable(s) children and young people to be informed, skilled, thoughtful, adaptable and enterprising citizens” and four of its eight main purposes are for learners to:

- develop understanding of the role and impact of technologies in changing and influencing societies
- contribute to building a better world by taking responsible ethical actions to improve their lives, the lives of others and the environment
- become informed consumers and producers who have an appreciation of the merits and impacts of products and services
- be capable of making reasoned choices relating to the environment, to sustainable development and to ethical, economic and cultural issues

(Education Scotland 2009a)

‘Technologies’ comprises ‘Technological developments in society’ and ‘contexts for developing technological skills and knowledge’, the contexts being: ‘computer science’, ‘food and textiles’, ‘business and enterprise’, and ‘craft, design, engineering and graphics’. Although the value of engaging young people through practical and authentic challenges, which include making, is acknowledged and encouraged, the focus of learning activities in Technologies is not solely the realisation of product outcomes. Below is a sample of statements from the ‘experiences and outcomes’ which are used to guide progression and determine capabilities of the learners (Education Scotland 2009b):

TCH 1-01c By exploring current news items of technological interest, I have raised questions on the issues and can share my thoughts. (approx. 7 year olds)

TCH 4-01c I can debate the possible future impact of new and emerging technologies on economic prosperity and the environment prosperity and the environment . (approx. 15 year olds)

TCH 0-02a Within and beyond my place of learning, I can reduce, re-use and recycle resources I use, to help care for the environment. (approx. 5 year olds)

TCH2-02a Having analysed how lifestyle can impact on the environment and the Earth’s resources, I can make suggestions about how to live in a more sustainable way (approx. 10 year olds)

TCH 3-02a From my studies of sustainable development, I can reflect on the implications and ethical issues arising from technological developments for individuals and societies. (approx. 12 year olds)

Examining the consequences of choice and personal actions through such a learner-centred approach is central to the curriculum framework currently being implemented.

Pedagogies of choice

Whatever the (espoused or hidden) curriculum circumstances, the teacher and their pedagogical approach is key to the development of design and technological literacy through choice-making. Of the various meta-discourses in play around choice education, we would suggest that it is the ethical that best informs the issues at play. Thus, the general approach may be democratic in style; caring in terms of peoples, other species and environments; and, cognisant of multiple, competing values positions.

For such an approach to blossom, it is worth embracing something of the smorgasbord of understandings available to the teacher. Democratic classroom attributes of explicitness, negotiation, questioning and reflection are advanced by Boomer (1999) while Harrison (2001, p.62) reminds us of '(students') diverse personal individuality', and Kimbell & Perry (2001, p.13) of 'the learner's strength'. In curricula such as those presented, 'Essential Learnings' and 'Responsibilities for All', are affirmations that the design teacher is not alone in teaching in ways that celebrate choice-making as valid education.

Within Design and Technology classrooms students are enabled to develop identity, express individuality and explore values contradictions through their design activity. Here, rich choice-making options – and dilemmas - can become the norm rather than the occasional curiosity. The teacher can draw attention to and celebrate the constant presence of choices in design action.

While it can be said that there are numerous moment-by-moment opportunities for exploring how and where choices arise within both design processes and product realisation, there are limitations on whether true choice is happening. Restricted choices may be because of resource limitations, the student's personal development, or the perceived artificial nature of the school setting. Nevertheless, herein lies the very educational opportunity for developing the knowledge that choices: a) exist; b) can be limited; c) have consequences; and, d) can themselves be consciously taken or avoided. Thus, design teaching not only serves design education itself, but advances choice-making as valuable disposition for life in general.

Towards this end, we can look to one of Boomer's (1999) democratic classroom attributes – that of negotiation – which challenges the teacher to have:

- a commitment to children becoming more and more self-reliant and socially critical;
- a genuine belief in the child as constructor of his/her knowledge
- a genuine and demonstrated capacity to be persuaded away from certain designs after due argument; (and),
- therefore a degree of vulnerability. (Boomer 1999, p.105)

Here, as with the South Australian and Scottish curricula, constructivist approaches are embraced whereby teacher and learners are co-constructors of the learning - and choice-making is key. The teacher celebrates the richness of variables and values at play, is open to critique and discussion, and is respectful of the student both as person and learner. The teacher is manager and facilitator of choice-making and neither dictates, nor inhibits (within reason), choice as design practice. By articulating a blend of open and closed design briefs particular choice options are

enabled or (intentionally) limited. Through such learning, the weighing of possibilities and the rationalisation of choice-making becomes the norm.

Design pedagogy is therefore not about a transmission model of the passing on and receiving of packaged knowledge. It conspires, transpires and transforms to expose continuously the presence of choice options, and, once choices have been made, the learning journey continues and new choice dilemmas present themselves. This is constructivist learning at work and it celebrates discussion, critique and the exploration of possibilities beyond the status quo.

Change in education and curriculum requirements, and in societal and learner expectation often requires change in pedagogy as well as in content and learning experiences. However, Dewey (1933, p.30) cautions, "Knowledge of methods alone will not suffice: there must be the desire, the will, to employ them. This desire is an affair of personal disposition." Dispositions form the link between knowledge and action. If pedagogical shift is needed then it is the teacher's own values that come into question and new (professional and personal) choices must be made. As McLaren (1997) noted, technical teachers (D&T) preferred to focus on technical and functional issues, for example when teaching product evaluation. Here, teachers tended to encourage learners to consider products and outcomes of design activity to be neutral and value free. When it comes to confronting social and environmental questions related to their discipline, some teachers may feel more comfortable remaining in the arena of tried and tested 'technical making' master-and-apprenticeship model of Technology Education and less so with the exploration of values, consequences and global issues arising from technological developments.

Planning for teaching and learning requires an appreciation that design decisions that are acceptable for some are unacceptable for others. Developing an awareness of the significance of global inter-connectedness through values-rich learning experiences is at the core of pedagogy and curriculum for choice education. Embracing challenging issues and contradictions requires explicit processes of imagining different ways of doing things; a central tenet of designerly thinking and action. Implicitly, this requires some pedagogical and intellectual risk taking. Becoming more able to respond to social and political dilemmas; applying knowledge and skills gained in one context to another in order to resolve an issue; or Design and Technology education for responsible and informed, active citizenship; demands more than simulations of processes that perpetuate industrial systems which *in themselves* require re-examination.

McLaren (2012) suggests that a range of planned scenario, story-line, or project based Technology education experiences offer opportunities to encourage participants to make connections, deal with uncertainty, engage in critical thinking skills, contend with dilemma, apply objective evaluation and recognise subjective responses. Whichever model of planning is adopted, the challenge for teachers is in finding a balance between: a) creating experiential tasks that allow students to find authenticity and meaning, and have genuine ownership of the design decisions and process through which they arrive at a proposal; and (b) being able to foresee potential issues, learning obstacles and being ready to intervene to aid the development of their personal and collective technological, scientific, mathematical, design and engineering knowledge, values and skills.

In addition teachers must also develop the pedagogical repertoire necessary to engage learners in exploring the concept of self and their relationships with technologies in a global context of societal, economic, environmental, cultural and

ethical values. In such contexts, learned sequences of procedures and mechanical application of skills are obsolete. Instead, teachers need to plan learning experiences which make demands of the students' choice-making, action-taking and consideration of responses. The pedagogies of project based learning and design thinking offer rich opportunities for learners to embark on a learning journey which immerses them in an authentic quest. The route of the quest/ design challenge is determined by choices and selections at every juncture.

Brookes and Young (2011) examine the relationship between choice, empowerment and intrinsic motivation. They suggest teachers explicitly adopt the language of choice-making and emphasise the opportunities that are open to the learner. There is evidence that learners respond with greater self-determination, increased motivation, perseverance and learner sense of satisfaction when they have been afforded the 'freedom' of choice. Albeit the context Brookes and Young (ibid, p.55-56) discuss is not directly related to the design education, there are messages which can translate well to design studio. Any design centred scenario, user-, client- or issue-based design challenge, or indeed evaluation of the design outcomes of others, offers choice-making opportunities and demands design decisions to be made. It is important that the planning of such learning experiences states explicitly where the choice-making opportunities are for the learner, and which design decisions create ownership, direction, learner response and experience. Compromise and choice, conflict and debate will inevitably enrich the learning journey and the complexity of designing will be encountered. If learners in Design and Technology are to engage as active participants and citizens they will need to have teachers who are willing, prepared and equipped to deal with uncertainty.

Towards altered consciousness

Design thinking and choice education for learners in terms of 'me, an individual, and I... as I choose to be and who I chose to spend my time with, and how I chose to present myself to others' is rich in opportunity, *so long as* the concept of self is recognised as having consequences for others. Translation of choice education theory into the pedagogical repertoire of a design and technology teacher can encourage reflection on the self-others-environments relationships and consequences. A design education can be enriched by incorporating contemporary controversial topics, emerging technologies and smart materials, consumption, and consumerism, and so on, all of which demand engagement of values, opinions and engagement through active questioning rather than passive acceptance, enables reflection, critique and design activism. Taking a 'critique stance' in any design approach will develop a higher level of awareness and articulation of choice and consequence. Inevitably, such teaching stimulates discussion on balancing personal responsibility, corporate social responsibility, public rights and individual rights, and the exploration of mechanisms to resolve associated tensions.

Case studies and critiques of designs and technologies as they relate to self, other people, other species, and to environments, develop an increased consciousness of the concept of choice and its associated constructs; of health and wellbeing - intellectually, emotionally, and physically; and of the value of reflection, respect, and empathy. Thus, what has been discussed here amounts to pedagogy of altered consciousness so far as designerly thinking and choice education is concerned.

Conclusion

Design literacy, technological literacy, citizenship literacy and education for sustainable development are all defensible educational aims. However, as has been shown with technological literacy, (Layton 1994; Petrina 2000; Keirl 2006, 2007) they are all contested as to what their meaning and purposes should be. The contestation is one of values dissonance and it is at the point where values are not in harmony that choices must be made.

Choice is a phenomenon that is in many ways present on a daily basis yet it often seems illusory and/or elusive. This paper has tried to show: that choice is a concept worthy of attention *across* education; that design education is a prime candidate for facilitating choice education; and, that curricular and pedagogical policy, research and practices do exist that can inform and articulate choice education.

An education in choice and choice-making is one that is both ethically defensible and ethically necessary. Choice is a tool of ethical practice and its presence as a phenomenon of human existence constitutes a rich arena for educating about personal and collective efficacy in designed worlds for preferred futures. Choice is not a straightforward concept or practice – to choose is to invoke rights, responsibilities, reflection, critique, defence and advocacy - all of which are dispositions for citizenship. However, to be educated in, and about, design is to not only invoke these dispositions but is also to engage with a rich spectrum of values-weighting and critiquing that are the givens of design discourses.

If choice education is engaged then, we suggest, consciousness (eg personal, communal, cultural, social, environmental, political *and* ethical) can alter. It is altered consciousness – not as a single, new consciousness but as multiple-collective consciousness - that facilitates new ways of being in the world and new worlds to be in. Design education is not only in a prime position to enact this engagement and develop altered consciousness but, we argue, it has a duty to do so.

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