Politicizing the Discourse of Consumerism: Reflections on *The Story of Stuff*

Terry Wilkinson

Abstract What might a critical pedagogy of consumption mean for design and technology education? In response to fervent calls for politicized forms of consumer, environmental, and science education, I submit that we also need to politicize design and technology education by providing learning experiences that encourage young people to critically analyze and question ecologically unsound processes of a market economy and, in particular, the relationship between technology and consumerism. In this chapter, I consider what a critical approach might offer to teaching for a critical literacy of the built world. First, a small section of the Ontario Elementary School curriculum is analyzed to identify how children consumers are discursively positioned and in whose interests these constructions work. Drawing on key ideas put forth by a number of critical scholars, I next consider the merits of using Annie Leonard's video, *The Story of Stuff*, as a resource for learning about technological design processes—including the motives underpinning increasingly short product life spans and externalized production costs. Presented as a quasi-case study, I suggest the video serves more importantly as a model for critiquing that aims to help young people prepare for and take responsible action on issues relating to their social and ecological well-being. The chapter concludes by proposing that the politicizing of discursive and technological practices in education—while challenging—will be necessary to foster critically literate, empathic, and confident problem-solvers and designers for social good.

Keywords Technology education • Design education • Story of stuff • Critical literacy • Critical pedagogy

1 Introduction

In response to fervent calls for politicized forms of consumer education (Farahmandpur 2010; McGregor 2010; Sandlin 2010), environmental education (Clover 2002; Hodson 1992; Jensen 2004; Kahn 2008a, b), and science and

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technology education (Hodson 1994, 1999, 2003), I submit that we also need to *politicize* design and technology education by providing learning experiences that encourage young people to critically analyze and question ecologically unsound processes of a market economy and, in particular, the relationship between technology and consumerism (Elshof 2005; Margolin 1998; Petrina 2000a). I locate my work within a critical practice perspective and stand with others who argue that conventional technological practices that narrowly address "needs-wants issues" (Keirl 2007, p. 310) can no longer be ethically justified and are therefore inadequate in terms of providing an education for the future (Elshof 2006, 2009; Huckle 2010; Petrina 2000a). Like Sue McGregor (2010), my utopian vision for the future is an education that empowers "citizens concerned with sustainability, solidarity, justice, peace, and the human condition" (p. 122). By "utopian," I mean the expression of desire—not in the form of unbridled fantasizing but as a concrete utopian imagining of how life could be *otherwise* (Bloch 1986)—that simultaneously anticipates and effects the future (Levitas 1997). This is a critical praxis-oriented project of hope that "reaches forward to a real possible future, and involves not merely wishfull [*sic*] but willfull thinking" (Levitas, p. 67).

In this chapter, I will first consider what Jennifer Sandlin and Peter McLaren's (Sandlin and McLaren 2010) call for a "critical pedagogy of consumption" might offer to teaching and learning in design and technology education. I will draw on the scholarly works of Darlene Clover and Katie Shaw (Clover and Shaw 2010) and John Huckle (2010) to think about the challenges of teaching for a critical literacy of the built world. Next, I will examine a small section of the Ontario Elementary School curriculum for science and technology in an attempt to answer two questions posed by Sandlin and McLaren: (1) "What kind of consumers are being created?" and (2) "In whose interests do those constructions work?" (p. 15). Following this analysis, I draw on key ideas put forth by these and other scholars to consider the merits of using Annie Leonard's (2007a) video animation entitled *The Story of Stuff* as a teaching resource for introducing students to sophisticated understandings of externalized costs and product obsolescence to problematize the discourse of production and consumption and to reorient design thinking for longer-term prospects (Pilloton 2009). My paper concludes by suggesting that the politicizing of discursive practices—while challenging—will be necessary to prepare informed, critical, and empathic problem-solvers and designers for social good (Chochinov 2009).

2   A Critical Pedagogy of Consumption

Drawing on the work of the Brazilian educator Paolo Freire and the radical consumer research of Norman Denzin (2001), Sandlin and McLaren (2010) call on educators to trouble the naturalization of consumption with its acquire-use-dispose logic of products. They imagine school as a place of contestation in which consumer capitalism is questioned and consumer resistance works as a space of learning

"where power, ideology, gender, and social class circulate and shape one another" (Denzin 2001, p. 325). Clover and Shaw (2010) also wish to interrupt the dictates of a consumer ideology that are tied to notions of "free and abundant choice of goods" as symbols of "freedom, affluence, and the good life" (p. 204). Others have argued that technology education with a cultural studies perspective can play a key role in exploring how the making of artifacts and consumption-driven lifestyles contribute to the sustainability problem (Elshof 2005, 2006; Petrina 2000a, b).

It has been noted by many critics (for instance, Foster 2002; Hoechsmann 2007; Molnar et al. 2010; Schor 2004) that commercial advertising promoting the consumption of goods and services has saturated our cultural, economic, and social worlds. Clover and Shaw (2010) have gone as far as to claim that learning to consume has been "one of the deepest and most pervasive educative processes at work since the Second World War" (p. 203). They and other scholars (e.g., Kahn 2008a, b, 2010a, b) have rightly argued that the lack of emphasis on political literacy in environmental education today is problematic because it enables, at least in part, large trans- or multinational corporate involvement and responsibility for socio-environmental impacts (e.g., unsafe working conditions, worker exploitation, pollution, natural resource depletion, species extinction) to remain hidden from public scrutiny. With specific reference to Canadian education today, Clover and Shaw have asserted,

> Problematically, much of what passes for public environmental education in this country has been woefully inadequate in responding appropriately to consumerism. In one regard, it ignores the politics of over-consumption and waste, choosing instead to focus on the individual and leaving corporations to carry out their activities unencumbered by critique or challenge from a politicized public. (p. 203)

The shortcomings of environmental education highlighted by Clover and Shaw seem to substantiate Sandlin and McLaren's (2010) critique of how the "misidentification" and "protect[ion of] the individual as the foundation of entrepreneurial capitalism" serves to replace "the well-being of the collectivity" with the "politics of consumption" (p. 14). Whether it is down to unintentional or willful blindness in school curriculum studies, the occlusion of corporate and government culpability works to sustain a capitalist orthodoxy of consumerism and profiteering in which neoliberal notions of free choice "celebrate the singularities of individuals by valorizing the desire to obtain and consume objects of pleasure" (Clover and Shaw, p. 206). Moreover, when the consumer is blamed for making a *bad choice*, companies again evade responsibility for their poor quality or unhealthy products (Jensen 2004) or the harm caused to others or the environment. Consumer blame and guilt were also the subject of an online article in *The Huffington Post*, in which the self-described unapologetic activist Annie Leonard (2012, ¶4) wrote:

> ...companies target consumers by creating desires we didn't know we had and meeting them with cheap shiny gadgets we didn't know we needed. And when the companies get caught trashing the environment or mistreating their workers, everyone blames the customers – that's us – for demanding cheap shiny gadgets... Sometimes it seems everything we buy is tarnished by guilt. Whether it's electronics from unsafe factories, clothes from oppressive sweatshops or coffee from the rainforest, we blame ourselves and our fellow consumers for our complicity in an unjust and unsustainable system.

Returning to Sandlin and McLaren's (2010) question about what kind of consumers are being created, Leonard's article would suggest that we are apolitical and dupable pleasure-seekers who, with the help of psychologists (Leonard and Conrad 2010), can be manipulated by the mediated arts of persuasion into thinking we need the goods and services we are offered. This may be an oversimplification but it behooves us to ask, in whose interests do these constructions of blame and guilt work?

For about 20 years, so-called green marketing strategies have been criticized for exacerbating the environmental dilemma. For example, while "eco-design" packages intended to appease consumer guilt may be lucrative for manufacturers, many such "greenwash" products do little to protect the environment (Lahaye 1995). Calling for better public education, Marie-Christine Lahaye (1995) suggests that only when advice on green consumption is "independent of industry and government" and includes "stakeholders from all sectors of society" will consumers be able to make informed and responsible purchases (p. 61). Twenty years on, a critical understanding of how green consumerism operates as a public pedagogy (Giroux 2005) still seems to elude many of us. The term "public pedagogy" refers to the life-shaping "educational forces" of culture that operate extensively in the sphere of formal schooling and increasingly across a wide variety of public sites of knowledge and meaning production (Giroux, ¶13–19). The mainstream culture of green consumerism is certainly one form of public pedagogy that requires our critical due diligence. As Richard Kahn (2010b) has rightly argued, "our educational relationship with the ecological issues that these products purport to help solve is reduced and cheapened when we accept that buying the new "eco-friendly" formula thereby absolves us of deeper levels of social inquiry and political action" (p. 49). Kahn openly questions how "endless repetitions of spending" on green products "in any way represents real opposition to either a culture defined by hyperconsumption or an economic structure that demands it" (p. 40).

While Leonard and Conrad (2010) do not outrightly reject the practice of "greensumption," they suggest that "an informed and engaged consumer is not a substitute for being an informed and engaged citizen" (p. 175). This philosophy is shared by Darlene Clover (n.d.), who envisions education as a transformative project for change in understandings (http://www.uvic.ca/education/psychology/people/home/faculty/cloverdarlene.php). Both she and Shaw (Clover and Shaw 2010) call for a stronger emphasis on the powerful influence corporations have in political, social, and environmental matters, as well as "on what needs to be done to change things around and return the blame to where it belongs" (p. 206). The goal of transforming understandings about the way things work—with the intent to tackle issues—is strongly resonant in Sandlin and McLaren's (2010) critical pedagogy that encourages learners to "question assumptions and challenge the status of existing structures as natural" (p. 16). The authors argue that locating human experience within a "specific social relations of production" framework will enable students to "see how, through the exercise of power, the dominant structures of class rule protect their practices from being publicly scrutinized as they appropriate resources to serve the interests of the few at the expense of the many" (p. 14).

3 Toward Political Literacy

If we are to educate for political literacy and citizen engagement, there are at least two assumptions currently operating in our hypercapitalist world that need to be challenged: (1) the idea that individuals have the freedom of choice when it comes to choosing goods and services and (2) the idea that the demand for products drives the supply. Leonard (2012) questions the logic of supply and demand by rhetorically asking, "Before single-serving plastic bottles, who wanted to carry around a throwaway container of water that, despite no guarantee of being cleaner or safer, costs thousands of times more than what comes out of the tap?" (¶6). Now some people might push back on this by pointing out that the manufacture of plastic bottles is a designed response to individuals' preferences and willingness to pay for lifestyle convenience and expression. However, when it comes to selecting goods and services, the idea of consumer choice also needs to be reexamined. As Matthew B. Crawford (2009) astutely noted, many commercial products are marketed with promises of greater personal choice, and yet the important design decisions have been remotely controlled—leaving only a "playground-safe field of options" (p. 69) for narcissistic gratification. In other words, aside from a few style elements such as color and shape, there is very little choice at all. Political theorist Benjamin Barber (2007) has also countered the notion that the essence of liberty comes from the "the right to choose from a menu," arguing instead that "the real power, and hence the real freedom, is in the determination of what's on the menu. The powerful are those who set the agenda, not those who choose from the alternatives it offers" (p. 139). If product choices are not consumer-driven but rather profit-driven (as Lahaye (1995), Leonard (2012), Crawford (2009), Barber (2007) and others have suggested), then herein lies an answer to Sandlin and McLaren's (2010) question: "*In whose interests are consumers constructed?*" (p. 15). When the creation of wants, proliferation of pseudo choices, and promotion of unconstrained acts of consumption generate profitable markets, it could be argued that willing consumers (Eastwood 2006) are primarily constructed to serve economic and corporate interests.

4 Constructing Consumer Identity Through Curriculum

Children are socialized into their consumer identities through advertising, marketing, and television shows (Denzin 2001; Foster 2002; Giroux and Pollock 2010; Steinberg 2011). To this I would add (along with Darder (2010), Elshof (2006, 2009), Kahn (2010a), Petrina (2000a), Schor (2004), and Spring (2003) that consumer identity, behavior, and consciousness are also constructed in schools. This is illustrated by taking a small excerpt from Ontario's science and technology curriculum (MoE 2007a) to analyze how middle school children in grade seven (year 7) are discursively positioned as consumers. Motivated by a desire to better understand how teachers (as curriculum mediators) are implicated, my search for moral and ethical grounding comes from a deep

concern I share with Steve Keirl (Chapter "Critiquing as Design and Technology Curriculum Journey: History, Theory, Politics, and Potential"), Susan McLaren (Chapter "Critiquing Teaching: Developing Critique Through Critical Reflection and Reflexive Practice"), and David Spendlove (Chapter "The Identification and Locationof Critical Thinking and Critiquing in Design and Technology Education"), who also believe critical questions must be asked to make visible—and possibly challenge—interests, viewpoints, and assumptions underlying educational policies and pedagogical practices. To this discussion I bring a very situated viewpoint, informed by personal classroom experiences and reflections on how particular activities and artefacts support or constrain the enactment of a prescribed curriculum (Edwards 2011). I have chosen to focus on this particular policy text for the following reasons. Firstly, Ontario is my home province where, over the course of my teaching career, I have engaged with different curricular formulations of technology education. Since its revision in 2007, the science and technology (S&T) document has been the *official* curriculum policy I know best. I am aware that my comments might invite the response that this case may not be generalizable beyond the Ontario context and even less so outside North America. This is certainly a reasonable response. However, Ontario's "post-positivist vision for science education" (Pedretti and Nazir 2011, p. 602) draws inspiration from the STS[E] (science, technology, society, and the environment) education movement, and while there is no unanimous agreement on what STSE is (Pedretti and Nazir p. 602), its "*science for all*" philosophy is strongly supported in other countries (e.g., Fensham 1988; Layton 1988; Solomon and Aikenhead 1994; Yager 1996; Ziman 1980). Another compelling reason why this analysis has relevance is that during and since the Decade of Education for Sustainable Development (2005–2014), Ontario— like many other provinces, states, and nations—has made efforts to introduce and/or revise existing environmental education and sustainability initiatives. Recommendations put forth in the Working Group report entitled *Shaping our schools, shaping our futures* (MoE 2007b) were purportedly based on "the successful practices of other jurisdictions in Canada and around the world" (p. 7), including three Canadian provinces, several states in the USA, Australia, Finland, Ireland, Israel, New Zealand, Sweden, and the "United Kingdom" (pp. 20–21). What is most interesting here is not that it is a case of "lesson drawing" (Rose 1991), but that it shows a particular interpretation of sustainability education, at a time when there was (and continues to be) no consensus on what sustainability means (Jickling and Wals 2008; Lee et al. 2015). To illustrate how sustainability has been conceptualized by Ontario's Ministry of Education, I will now examine a section of the S&T curriculum document.

5   Problematizing the Discourse of Technological Design

The fundamental concepts of sustainability and stewardship, embedded within an STSE framework, cover a number of social, economic, and environmental considerations as is shown in the following grade seven objective for the study of "form and function":

By the end of Grade 7, students will:

1.1 evaluate the importance for individuals, society, the economy, and the environment of factors that should be considered in designing and building structures and devices to meet specific needs (e.g., *function; efficiency; ease of use; user preferences; aesthetics; cost; intended lifespan; effect on the environment; safety, health, legal requirements*) (MoE 2007a, p. 130; italics in original).

Sample guiding questions are suggested to teachers for scaffolding critical inquiry. However, upon closer reading of these questions, the seemingly well-intentioned STSE approach takes a market-driven turn. For example, the question, "Why is it **important for companies to find out what consumers want now** and what they might want and/or need in the future?" (MoE 2007a, p. 130; bold added) prioritizes the perspective of "companies" while it positions consumers as users of products and services. From a critical practice perspective, I think that other equally important questions could, and should, be: "What are some of the ways companies externalize their costs of production?" and "Why is it necessary for consumers to pay the true cost of a product? Justify your answer from an eco-justice standpoint." Following the earlier question is another related to life cycle analysis:

What things **might a company need to take into account** when considering the construction of a new structure **that consumers might not consider** (e.g., the environmental impact of using certain resources to make the structure, the eventual disposal of the structure)? (MoE 2007a, p. 130; emphasis added)

This question is clearly posed from a hypothetical "company" or corporate perspective. The suggestion that "consumers might not consider" resource and waste management issues effectively positions commercial business as sole decision-maker, while consumers who lack agency or technological literacy are left out of the process. One might also wonder why industrial designers, engineers, tradespeople, and employees—among other invested citizens—would not be identified. This simplistic, and arguably perhaps, false dualism between business and consumer offers no place in which students can participate as "collective caretakers of the planet" (Darder 2010, p. xv). Granted, given only two choices, it is more likely that 12-year-old children would identify their interests as entitled consumers rather than as corporate executives. Still, what is lacking is any question for reciprocal accountability to offset the company perspective. One suggestion could be, "What courses of action could be taken by consumers, workers, citizens and governments to hold parties accountable for violating environmental protection laws or contravening workers' basic rights to safe and fair labour practices?"

The lack of a strong critical and ethical focus is also evident when, in the basic concepts section of the curriculum, the learning expectations are framed in a technocentric design and manufacturing process. Concerning the suitability of materials for use, the document states,

By the end of Grade 7, students will:

3.7 identify the factors *(e.g., properties of the material as they relate to the product, availability, costs of shipping, aesthetic appeal, disposal)* that determine the suitability of materials for use in manufacturing a product *(e.g., a running shoe)*. (MoE 2007a, p.131; italics in original)

Here, the imperative to "identify factors" utilizes a distinct linguistic form commonly associated with school science. Such commands or directives imply that the knowledge students are expected to master is already known by the asker of the question (Olson 1989). No critique is explicitly called for—scientific certainty is the hallmark of well-established matters of fact and unproblematic objects (Latour 1987, 2004). Without question, telling the complex life cycle story of a running shoe made by a multinational corporation would require much study. However, it seems surprising that there is no accounting for fair trade and social justice "factors" anywhere in this entire grade seven strand, considering that Petrina (2000a) and others have reported how:

> [m]ost of the assembly is done through the labour of children and women cutting, gluing, and sewing under sweatshop conditions of high temperatures (100 degrees F) and toxic fumes from solvent-based toluene glues and paint. Their average wage is about 15 cents per hour over their 65 hour work week . . . (p. 217)

The failure to acknowledge exploitive practices serves to keep the study safe from moral or ethical redress and is one more instance where child-consumer identities are constructed as "future technologists rather than technologically capable critical thinking citizens" (Elshof 2009, p. 138). With the exception of the environmental design "factor" of disposal, decisions are presented as straightforward and value-neutral considerations with little regard for quality-of-life issues for humans and nonhumans. Moreover, I would add that the relatively uncritical and apolitical activity of identifying "factors" runs the unintended risk of sanctioning ignorance (Andreotti 2006) of the role of colonialism in wealth creation for the so-called First World, not to mention the role of the "color-coded international division of labor" (Wright 2012, p. 49) to maintain that wealth.

6 Multimedia Classroom Resources for Critiquing Consumption

Teachers have the difficult task of devising situations, to use Maxine Greene's (2000) words, "in which the young will move from the habitual and the ordinary and consciously undertake a search" (p. 24). Despite our current environmental dilemma (and some would argue we are facing an ecological crisis), I am not aware of very many multimedia classroom resources that both address these complex issues from a critical perspective and in a mode that young middle school learners can comprehend.

Contemporary forms of design activism (Fuad-Luke 2009) can help to raise public awareness of the impact of overconsumption (e.g., culture jamming), as well as afford new and imaginative ways to communicate complicated, statistical data information in ways that are easily understood by non-experts. Alastair Fuad-Luke (2009) has highlighted a small number of successful projects that draw on the strength of visual representation. These include Worldmapper's (n.d.)

distortions of map projections based on population and Giraffe Innovation's (2015) interactive project called Changing Habbits where the environmental impact of personal consumer habits is represented by 3D humanoid renderings. I also recommend for school-age children, in particular, two clever animations and e-learning resources that promote life cycle thinking by disclosing the hidden impacts of manufactured products: Leyla Acaroglu's *The Secret Life of Things* (http://www.thesecretlifeofthings.com/) and Annie Leonard's *The Story of Stuff* (http://storyofstuff.org/). Both of these projects creatively illustrate how symbolic imagery, metaphors, and humor can be utilized as powerful storytelling tools. In the next section, I describe how *The Story of Stuff* provides a springboard for critiquing issues of consumption, injustice, and environmental degradation.

6.1 A Creative and Critical Teaching Resource: The Story of Stuff

As a quasi-case study of the materials economy, *The Story of Stuff* offers a positive and engaging alternative to less effective "expository and didactic" approaches to information sharing (Clover and Shaw 2010, p. 206). Leonard's (2007a) short and fast-paced video animation of simple black and white cartoon figures is an edgy, visually entertaining, and humorous anti-capitalist critique of the problems inherent in the linear production-consumption-disposal mindset of American consumer culture. The sophisticated and creative use of visual metaphors helps to explain social and psychological concepts related to the design and marketing of familiar everyday products. Leonard deconstructs the discourse of consumption by describing a "system in crisis": the exploitation and overconsumption of the world's resources, the use of toxic chemicals in manufacturing, the externalized costs of production for profit, the planned and perceived obsolescence, and the unsustainable cradle-to-grave approach to waste management. While the scope of this paper does not permit a very detailed description or in-depth analysis, a few screenshots selected from the video will illustrate how critical literacy is fostered.

7 A Critique of Hyperconsumerism

Figure 1 shows a person caught in a nonstop "work-watch-spend treadmill" (Leonard 2007b, p. 13). This clever visual metaphor depicts a perpetual cycle of consumption driven by the desire to seek happiness through the accumulation of products. The image ties in remarkably well with Allan Schnaiberg's (1980) concept of the "treadmill of production" along with John Foster's (2002, p. 45) characterization of the system as a "giant squirrel cage" and John Huckle's (2010, p. 136) "capitalist treadmill in crisis." Driven by the desire to accumulate wealth, the

**Fig. 1 Work-watch-spend
treadmill**. (Screenshot taken
from the Story of Stuff
video). Retrieved July 22,
2013
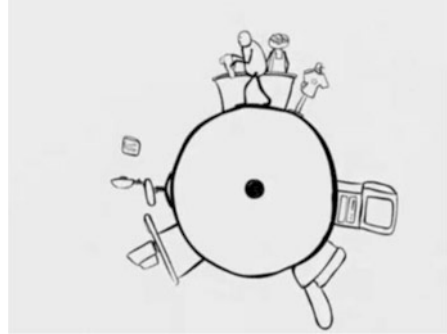
treadmill "manufactures consumer wants in a way that creates an insatiable appetite
for more" (Huckle, p. 137). Children are not immune to the imperatives of capitalist
production (Langer 2002, p. 72). Driving their consumptive behaviors are feelings
of longing and dissatisfaction which, according to Beryl Langer (2002) and Jeremy
Seabrook (1985), are produced and manipulated by corporate advertising.

## 8 Critique of Design's Role in Product Obsolescence

Many young people are not familiar with the manufacturing and marketing strate-
gies of product obsolescence. Leonard (2007a) is able to problematize the discourse
of consumerism with the clever alliteration "designed for the dump" (see Fig. 2).
Quoting Lahaye (1995), she explains that by the 1950s, "forced consumerism was
extolled by the markets as a must: things had to be consumed, burned, used, replaced
and discarded at a constantly accelerating pace" (p. 60). In his book, *Made to Break:
Technology and Obsolescence in America*, Giles Slade (2006) traced the history of
product design and the underlying profit motive for technological, psychological,
and planned obsolescence. Noting that industrial designers like Brooks Stevens
were unapologetically open in those years about the underlying profit motive (see
Adamson 2003), Slade stated, "Not only did we invent disposable products, ranging
from diapers to cameras to contact lenses, but we invented the very concept of
disposability itself, as a necessary precursor to our rejection of tradition and our
promotion of progress and change" (pp. 3–4). (see Figs. 3 and 4).

I have found that many 12-year-olds' level of understanding of the materials
economy goes as far as thinking that *cheap things usually break because they are
cheap* and they, as consumers, are the victims of a "rip-off." *The Story of Stuff*
informs them that they are not the only "victims." The reason why many products
can be sold so cheaply is that the true costs are externalized, which means that other
people are "paying" through poor wages, dangerous working conditions (see Fig. 5),
and destruction of their local environment. The exploitation of others struck a chord
with some of my students who expressed their understanding and empathy in terms

**Fig. 2 "Designed for the dump."** (Screenshot taken from the Story of Stuff video). Retrieved July 22, 2013

Fig. 3 Products are designed to be useless as quickly as possible (Leonard 2007a, b). (Screenshot taken from the Story of Stuff video). Retrieved July 22, 2013
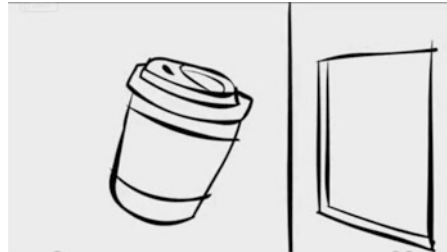
Fig. 4 The profit motive underlies deliberate obsolescence and the promotion of progress and change. (Leonard 2007a, b). (Screenshot taken from the Story of Stuff video). Retrieved July 22, 2013
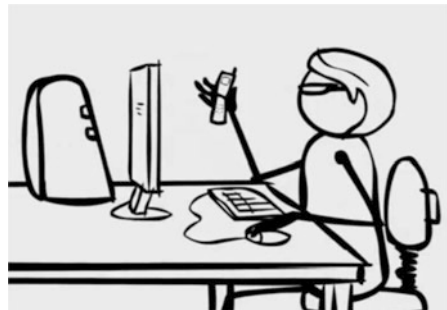
Fig. 5 Factory workers of reproductive age are exposed to many toxic chemicals. (Leonard 2007a). (Screenshot taken from the Story of Stuff video). Retrieved July 22, 2013
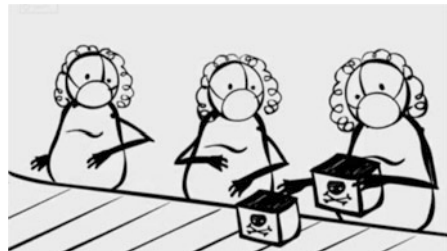
of "fairness." They thought that people should have the right to live in a safe place and they should be paid fairly for their labor.

Young people are often surprised and perturbed to learn of the possibility that the products they buy are deliberately designed to break. Another revelation for many has been the issue of perceived obsolescence (i.e., the notion that things
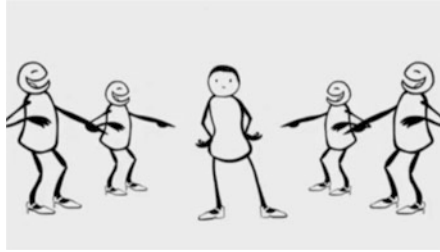
Fig. 6 In our capitalist system, "if you don't own or buy a lot of stuff, you don't have value"
(Leonard 2007b, p. 4). Fashion designers are implicated in the arousal of desire, mass production, and hyperconsumption of commodities. (Screenshot taken from the Story of Stuff video). Retrieved July 22, 2013

that still work are no longer desirable). The video depicts a familiar peer group scenario in which new things are acquired either to establish one's social status or to avoid shame (see Fig. 6). In a capitalist system, those (poor and minority youth in particular) who cannot afford the money, resources, and leisure time to shop for new things are considered "failed consumers" (Giroux 2015), or as Leonard (2007b, p. 4) explains, "If you don't own or buy a lot of stuff, you don't have value." Research on the influence of peer groups and the mass media on commodity consumption supports my personal observation that middle- and upper middle-class children are quite aware of the rapid turnover of digital technologies and clothing, and many readily admit to their desires to purchase the newest models and stylish brand-name fashions of "coolness" as markers of self-identity and group identity (Hoechsmann 2010; Willis 1991). Very often, material culture is used to demarcate social difference but it can also lead to the social exclusion of others (Martens 2005, p. 355). Conspicuous consumption, as noted by Slade (2006), is in part manipulated by marketers who psychologically target people's anxiety and "desire not to lose face" (p. 51). Corporate advertising is one redoubtable pedagogue (Steinberg 2011). In 2002, it was estimated that the average American watched 21,000 television commercials a year and that in 1 year alone, the $1 trillion marketing expenditures aimed at consumers by American businesses exceeded the total spent on public and private education by about $600 billion (Foster 2002, pp. 46–47).

9   A Call to Action

Pronouncing that even our existing recycling practices are unsustainable, Leonard (2007b) concludes her critique with an open-ended call for collective action and "a new school of thinking" (p. 15) based on principles of sustainability and equity. Clean production, green chemistry, zero waste, closed loop production (see Fig. 7), and renewable energy are some of the initiatives she identifies. In effect, the viewers are socially positioned—not as compliant shoppers but as capable agents of change.

Fig. 7 True recycling.
Closed loop production seeks
to eliminate natural resource
input and waste output
(Leonard 2007b, p. 15).
(Screenshot taken from the
Story of Stuff video)

10 Critiquing the Critique

So far, I have focused solely on the merits of *The Story of Stuff* but would be
remiss if I did not also acknowledge that there has been some opposition to its
use in schools. In this section, I will first briefly identify key criticisms offered by
those in the fields of science, interest group politics/public policy, and education,
followed by a carefully considered rejoinder. Extending the critique, I will then
reflect on the difficult challenge teachers face when negotiating the tensions between
indoctrination and empowerment (Pedretti and Nazir 2011).

10.1 *Chemophobic and Anti-capitalist Propaganda*

Leonard's detractors dismissed the film as misleading, factually inaccurate, statis-
tically skewed, leftist, and anti-capitalist propaganda (e.g., Baum 2009a; Cooper
2009; Doren 2009; Kaufman 2009). The issue of public risk in the production,
use, and disposal of carcinogens was particularly provocative for some members
of the American Chemical Society, who expressed consternation over what they
considered to be "chemophobic" propaganda that deployed "scare tactics" of
misrepresentation, exaggeration, or oversimplification of certain chemical effects
(Baum 2009b, p. 3; Frantom 2009, p. 4; Canan 2009, p. 4). Among the most
outspoken critics were members of self-described conservative think tank organiza-
tions who subscribe to libertarian principles of free enterprise, limited government,
environmental skepticism, and a strong national defense: the Heritage Foundation,
the National Center for Public Policy Research, and the Competitive Enterprise
Institute. Using the logic of market self-regulation, outsourcing is viewed not as
exploitation, but as an example of mutually beneficial global cooperation (Doren
2009). The issue of environmental degradation was deflected with the argument
that technological innovations had, among other things, increased food production,
improved water quality, and reduced the volume of trash going into landfill
dumpsites (Doren 2009).

   From a critical literacy perspective, such technocentric, salvationist, and pater-
nalistic rebuttals are extremely problematic in the way they celebrate technical

fixes, gloss over the complexities of social problems, forget past legacies and complicities, and thereby serve to reproduce—albeit perhaps inadvertently—what Vanessa Andreotti (2012) has described as "problematic historical patterns of thinking and relationships" (p. 2).

10.2   More Pedagogical Considerations

As a cautionary reminder, teachers need to be sensitive to their students' cognitive and emotional readiness to grasp relatively complex concepts of systems thinking (Pitt and Heinemeyer 2015) or handle stark and scary facts (Kaufman 2009) to avoid undue anxiety, fear, anger, guilt, or paralysis. It was reported in *The New York Times*, for instance, that one 9-year-old boy was "worried it might hurt the environment if he bought a new set of Legos" (Kaufman, ¶20). Social class may be another consideration as one teacher warned that "students, particularly affluent ones, might take the critique personally," become offended, and "turn off the learning button" (Kaufman, ¶20). Little research exists on the consumption experiences of children; however Lydia Martens (2005) and Leonard et al. (2003) have argued against treating young consumers as a singular homogeneous (i.e., white, middle class) social entity and call for more exemplary studies (e.g., Chin 2001) to better understand how socioeconomic and cultural background influence consumer-related learning, conduct, and values. And by the same token, one might wonder how differently *The Story of Stuff*'s unmistakably middle-class American-centric message has been received not only by different groups across the USA but in different countries as well.

10.3   Teaching or Indoctrination?

Probably the most common criticism against the use of Leonard's video in schools is that it proselytizes or indoctrinates school children (e.g., http://www.groupsnoop.org/Greenpeace). While there are many different interpretations of the meaning of indoctrination, the main concern is that students are left open to manipulation when only one side of a political or controversial issue is being presented (Dobson 2003, p. 196). At the heart of this debate are larger questions about the very purpose of education and whether the enactment of curricula can be neutral. Space limitations here preclude the detailed treatment such a discussion deserves, but for the record, I am not alone in my view that education is not a neutral process (e.g., Shaull 2000) and that curricula and resources carry (often implicit) values and beliefs (e.g., Apple 1990, 2014; Jenkins 1992; Layton 1988; Vasquez 2014). This is not to deny that there is a need for the continual reexamination of one's own educational practices (Pedretti and Hodson 1995). I fully recognize that classrooms cannot be *value-free* environments, but maintain (along with Loving et al. (2003) and Zeidler

et al. (2005)) that teachers should strive to make them *value-fair*. I believe it is important to move classroom discussions beyond simplistic and unhelpful binaries of good/bad, capitalist/anti-capitalist binaries by exposing students to a wide range of ideological perspectives and encouraging them to deconstruct conventional wisdom. There are environmental education critics (e.g., Jickling 1992, 1994, 2005; Jickling and Spork 1998; Jickling and Wals 2008, 2012) who are adamantly opposed to instrumental aims of an "education for" and argue that working toward prescribed ends is counterproductive to broad, pluralist conceptualizations of "critical literacy as a practice of opening to the world" (Nicholson et al. 2012, p. 75).

It is for these reasons that I include *The Story of Stuff* as one of many resources in my teaching toolkit. As a pedagogical model, the video is instructive because it avoids the pitfalls of what Clover and Shaw (2010) identify as the "stifling, limited, and pedantic aspects of so much environmental education" (pp. 206–207). In contrast, Leonard (2007a) maintains the "ordinary" citizen consumer status that she establishes in her introduction (as an iPod owner) and sidesteps the higher status generally attributed to experts. I think Sandlin and McLaren (2010) would applaud the way in which *The Story of Stuff* locates human experience "within specific social relations of production" (p. 14). Leonard (2007b) does this by tracing back through the life cycle of a portable radio from the shelf of a big box store, through the hands of a minimum wage cashier, shelf stocker, transport driver, ocean freight handler, "some 15 year old in a maquiladora [factory] in Mexico," and "the kids in parts of the Congo . . . [who] have had to drop out of school to mine coltan" (p. 8). Rather than *The Story* ending, she enthusiastically invites her viewers to join in; to "reclaim and transform this linear system . . . . Remember that old way didn't just happen by itself. It's not like gravity that we gotta live with. People created it. And we're people too. So let's create something new" (Leonard 2007b, pp. 15–16). Here Leonard uses a "language of possibility" (Giroux 1988) to promote social change through collective action. With strong leanings toward a "praxis-oriented pedagogy" (Farahmandpur 2010, p. 66), the video discursively brings together critical knowledge and social practice. It is now up to the teacher to extend the gesture by creating opportunities for students to participate in reconstructive efforts for a fairer society.

Granted, simply watching this video does not turn viewers into active citizens, or activists, or artists, or designers, but it does introduce educators and students to a new discourse and critical framework for thinking about how they might take "more informed, responsible and ethical action" to help solve the problems of inequality and injustice (Andreotti 2006, p. 48). According to Vanessa Andreotti (2006), reflexivity and dialogue are basic principles for personal change in a critical citizenship education that promotes "engagement with global issues and perspectives and an ethical relationship to difference, addressing complexity and power relations" (p. 48). By identifying problems inherent in a linear production-consumption-disposal paradigm, *The Story of Stuff* does have the potential to inspire young people's future design activities. But at the very least, critical discursive practices could serve to interrupt the ideology of consumption. As Leo Elshof (2009) persuasively argues:

Although young people are not responsible for designing or creating the technological systems within which they live, they are nonetheless active participants in its evolution. Long before they have become technologically literate, they are active as young citizen consumers. In this sense they do become co-creators of the world and technology education can help them understand why they must begin to share responsibility for its care. (p. 138)

11 Implications for Technology Education

With the ecological health of our planet in jeopardy, our Western "throwaway ethic" (Slade 2006, p. 281; see also Packard 1960) is no longer sustainable. As Elshof (2009) asserts, countries like Canada and the USA—which create the largest ecological and carbon footprints on the planet—have the added responsibility to encourage their young people "to think and act differently in terms of the ways they use, consume and design technologies" (p.134). A critical design education can play a key role in contesting the manufacturing of desires and to "problematize the inter-relations between conspicuous consumption and ecological death" (Petrina 2000a, p. 212). While I am encouraged by the latest revisions of the Ontario curricula for science and technology education that boldly introduced an STSE foundation, I am troubled by the prevailing ideological discourse of neoliberalism that continues to prioritize values of individualism and economic competitiveness. More than a decade ago, Petrina (2000a) argued for a "political ecology of design" (p. 218) where ecological values of care, complex life cycles, and interconnectedness work in tandem with "political values such as control, distribution, equity, interests, justice, liberty, and power" (p. 218). Sadly, as the horrific deaths of more than 1100 Bangladeshi garment workers in April of 2013 tragically remind us, criticality is urgently needed to problematize the interrelations between hyperconsumption and what Foster (2002) believes are "issues of economic justice—the exploitation of the poor by the rich" (p. 49).

12 The Challenges of Critical Literacies for Design and Technology Education

Design and technology education, from a critical literacy perspective, has tremen-dous potential as a site for transformative learning in which young people are encouraged to develop the intellectual tools to *critique* and *act* "to transform the world around them in ways that make a more just and democratic society for everyone" (Saltman 2005, p. 119). By carrying out their own design projects, students can develop their capacities to imagine the future "as something more than a repeat of the present" (Giroux 2005, ¶34). As Derek Hodson (1994) argued, "Politicisation of science [and technology] education can be achieved by the provision of opportunities for confronting issues that have a scientific, technological or environmental dimension" (p. 84) and maintained that young people are more

likely to become active citizens if they are encouraged to take "suitable action" (p. 87) in their local schools and communities. As teachers, we need to deepen our own criticality so that we can recognize how we are both part of the problem and how we can be part of the solution (Andreotti 2006). If we do not, then we "run the risk of (indirectly and unintentionally) reproducing the systems of belief and practices that harm those [. . . we] want to support" (Andreotti 2006, p. 49–50). The challenge to D&T teachers then is to create safe spaces where students can critically engage and reflect on how we came to think, feel, and act the way we do and then try out other ways of being and acting in the world. This pedagogical approach encourages but does not impose change on the learners—the decision of whether or how to change or take action is ultimately to be made by the individual student (Andreotti 2006). Otherwise, if "correct" readings of the world are determined by teachers, there is a danger that critical literacy's project of reconstruction could lead to one of indoctrination (Nicholson et al. 2012; Pedretti 2003; Pedretti and Nazir 2011).

Developing a critical technological literacy about how systems currently work begins with knowledge and understanding of how local everyday consumption practices are tightly linked to global processes of capitalist production. From a social responsibility perspective, it is incumbent upon "citizen designers" (Heller & Vienne 2003) to consider objects—not in isolation, but as constituent elements of a dynamic "macrocosm" that includes, to quote Véronique Vienne (2003, p. 244), "all the befores and afters of the manufacturing process." To effect social and environmental change, Vienne is among those who propose that designers must, for example, trace the origins of specific food or other material chains, consider whether or not their projects are part of a renewable energy system, design waste out of products' life cycles, and create artifacts for easy disassembly, remanufacture, or recovery (see McDonough and Braungart 2002; Pitt and Heinemeyer 2015).

Teachers also need to appropriate the powerful communication techniques that marketers and advertisers employ so well in order to create "a counter-ideology" (Freire 1985, p. 18) that will challenge taken-for-granted beliefs that serve only the interests of the socially powerful (Clover and Shaw 2010). I propose that through "purposeful critiquing" (Keirl 2007), we help young people engage in problem-posing (Freire 2000) for positive social and environmental change (Hodson 2003). Instead of creating consumers, we create consumer advocates and cultural critics (Denzin 2001, p. 326). Instead of reproducing a mindset for designing objects as solutions, we reorient design thinking as an ethical solution-building process for "social good" (Chochinov 2009, p. 8; Fuad-Luke 2009; McCoy 2003; Riley 2003; Vienne 2003) that may not even create more products (Keirl 2007; Pilloton 2009). And instead of preparing future technologists, we prepare critical and technologically literate citizens who will question and challenge our "*existing* technologies, systems and worldviews [that] contribute to the global environmental crisis" (Elshof 2009, p. 142; italics in original). Informed by a "politicized ethic of care" (Hodson 1999, p. 789), the rejection of rampant consumerism for "a more environmentally sustainable lifestyle that promotes appropriate technology" is, in itself, a kind of social reconstruction. Hodson (1994, 1999) propounds that

education for developing critical scientific and technological literacy entails helping students to develop a deep understanding of socially and personally relevant issues, *as well as* learn how to translate their concern into responsible actions (Hodson 1999, p. 789). Increasing competence to take some form of action to solve student-identified problems is key for countering "action paralysis" (Jensen 2004). With specific reference to environmental education, Bjarne Jensen proposed that teachers begin with the "views, concerns and anxieties of students" in order to "[transform] the sense of powerlessness into the desire and ability to act" (p. 405).

13   Concluding Remarks

I would like to think that my students' attitudes as expressed through classroom talk and design projects have been influenced in part by some of the messages presented in *The Story of Stuff*. As Keirl (2007) points out, it is through (de)constructive critique that students develop their voices "as would-be democratic citizens" (p. 310). At the very least, I am confident that many young people are able to understand and are eager to participate in discussions and debates, as well as take action to address issues related to planned and perceived obsolescence, the ethics of fair trade, the externalization of costs, and the impact of technology on the environment (see Wilkinson and Bencze 2015; Chappell 2015). Also encouraging are teachers' stories about "children who become environmental advocates at home after seeing the video" (Kaufman 2009, ¶21; see also Sperling et al. 2014; Zoras and Bencze 2014). Active engagement in school and community design projects that address issues is central to students' personal transformation (Taylor 2008) as they learn to learn, do, be, live, and work collaboratively, "translate their intentions into actions" (Pavlova 2015, p. 96), and ultimately bring about social change (Hodson 2003). I am also mindful, however, that while there are benefits to be gained by teaching for a critical literacy of the built world (Petrina 2000b), we need to be prepared for the possibility of unintended emotional fallout when learners may experience feelings of "guilt, internal conflict and paralysis, critical disengagement, feeling[s] of helplessness" (Andreotti 2006, p. 48). In the unsettling process of critical self-reflection, great courage and humility are required when we recognize "how we are [all] implicated or complicit in the problems we are trying to address" (Andreotti 2012, p. 2). For this reason, I think there is much to learn from multimedia resources like *The Story of Stuff* in which alliterative, metaphoric, and visual forms of conversational storytelling are cleverly utilized to raise consciousness and stimulate imaginative critique. Perhaps it is the video's creative use of animation and humor—along with Leonard's message that we are all in this mess together—that helps to inspire and motivate people to become part of the solution. My speculations invite further inquiries into the affordances of word play and what Åsa Wettergren (2009) refers to as "fun/humour" to "[open] up the present and [show] that 'another world is possible'" (p. 6). Critical explorations into the pedagogical role of "utopian laughter" (Wettergren, p. 6) that arises from a reflexive stance with the world would

certainly add to the existing but limited educational research on the use of humour (such as Boyle and Stack (2014), McGhee (1989), and Zuk and Dalton (1998)).

Imagination and creativity are also resources with great emancipatory potential for developing new methods for "seeing, exploring and challenging the world being created for us" (Clover and Shaw 2010, p. 206; Greene 2000). From an action-oriented perspective, designing, like problem-posing education (Freire 2000), is based on creativity and calls for reflection and action upon reality (p. 84). Critical design thinking aims to break free from what is considered fixed or perhaps escapes our notice entirely. Imagination is what makes empathy and entering others' worlds possible (Greene 2000). It enables us to look at things with the view to make them *otherwise* (Bloch 1986; Greene 2000) and, as such, is hopeful. Also encouraging is Clover and Shaw's (2010) work in arts-based communities of practice which can remind us "[the] arts are far more than mere self-expression; they are tools of emancipation and critical learning that can inflame politicians, force people to see the taken-for-granted differently, and engage the imagination in explorations of consumerism" (p. 211). I am reminded of Friere's (1985) understanding of education as "simultaneously an act of knowing, a political act, and an artistic event" (p. 17). He believed that helping children "shape themselves as beings" (p. 17) constitutes the dynamic, difficult, and aesthetic work of the teacher learner. Stressing the politicity of education, Friere wrote,

> When we try to be neutral, ... we support the dominant ideology. Not being neutral, education must be either liberating or domesticating [or a mixture of both]. ... Thus, we have to recognize ourselves as politicians. It does not mean that we have the right to impose on students our political choice. .... Our task is not to impose our dreams on them, but to challenge them to have their own dreams, to define their choices, not just to uncritically assume them. (pp. 17–18)

While I am not claiming that a 20 min "cartoon" will inspire life-changing world views, I do think *The Story of Stuff* is a creative pedagogical resource for developing critical learning. It acquaints viewers with a language of possibility (Giroux 1988), models purposeful critiquing (Keirl 2007) of our cultural patterns of material consumption, and stimulates ethical design thinking with a care-driven sensibility for ecological and social justice (Noddings 2010; Orr 2004). The level of thoughtfulness and ethical concern my own students express for the welfare of others and the natural world keeps me hopeful about the future for active and critical citizenship—just as the work of critical education scholars (including, but not limited to, those identified in this chapter) strengthens my resolve to advocate for a politicized form of design and technology education.

References

Acaroglu, L. (n.d.). *The secret life of things: Uncovering the hidden environmental impacts of everyday things!* Retrieved from http://www.thesecretlifeofthings.com/

Adamson, G. (2003). *Industrial strength design: How Brooks Stevens changed your world* (p. 2003). Cambridge, MA: MIT Press.

Andreotti, V. (2006). Soft versus critical global citizenship education. *Policy and Practice*: *A Development Education Review, 3,* 40–51. Retrieved March 2012, from http://www.developmenteducationreview.com/issue3-focus4

Andreotti, V. (2012). Editor's preface: HEADS UP. *Critical literacy: Theories and practices, 6*(1), 1–3.

Apple, M. (1990). *Ideology and curriculum.* [EBook]. New York: Routledge.

Apple, M. W. (2014). *Official knowledge: Democratic education in a conservative age* (3rd ed.). New York: Routledge.

Barber, B. R. (2007). *Con$umed: How markets corrupt children, infantilize adults, and swallow citizens whole*. New York: W.W. Norton & Co..

Baum, R. (2009a, February 23). More on limits. *Chemical and Engineering News, 87*(8), 3. Retrieved from

Baum, R. (2009b, May 18). The story of stuff. [Editor's Page]. *Chemical and Engineering News, 87*(20), 3. Retrieved from http://cen.acs.org/articles/87/i20/Story-Stuff.html

Bloch, E. (1986). *The principle of hope.* (1 ed.). (trans: Plaice N., Plaice S. , & Knight P.). Cambridge, MA: MIT Press.

Boyle, F., & Stack, N. (2014). An explorative study into the possible benefits of using humor in creative tasks with a class of primary five pupils. *Humor, 27*(2), 287–306. doi:10.1515/humor-2014-0029.

Canan, S. S. (2009, August 3). The story of stuff. [Letter]. *Chemical and Engineering News,* 87(31), 4. Retrieved from http://cen.acs.org/articles/87/i31/Story-Stuff.html

Chappell, B. (2015). Sustainability + fun = A change in behavior. In K. Stables & S. Keirl (Eds.), *Environment, ethics and cultures: Design and technology education's contribution to sustainable global futures* (pp. 271–284). Rotterdam: Sense Publishers.

Chin, E. (2001). *Purchasing power: Black kids and American consumer culture*. Minneapolis, MN: University of Minnesota Press.

Chochinov, A. (2009). A good long tradition. [Foreward]. In E. Pilloton (Ed.), *Design revolution: 100 products that empower people* (pp. 6–9). New York: Metropolis Books.

Clover, D. (2002). Traversing the gap: Concientización, educative-activism in environmental adult education. *Environmental Education Research, 8*(3), 315–323. doi:10.1080/1350462022014546 5.

Clover, D. (n.d.). *Darlene Clover*. [Research statement]. Retrieved from http://www.uvic.ca/education/psychology/people/home/faculty/cloverdarlene.php

Clover, D. E., & Shaw, K. (2010). Re-imagining consumption: Political and creative practices of arts-based environmental adult education. In J. Sandlin & P. McLaren (Eds.), *Critical pedagogies of consumption: Living and learning in the shadow of the shopocalypse* (pp. 203–213). London: Routledge.

Cooper, R. (2009, May 11). The story of lies: Greenpeace in your kid's school. *The Daily Signal.* [The Heritage Foundation]. Retrieved from http://dailysignal.com/2009/05/11/the-story-of-lies-greenpeace-in-your-kids-school/

Crawford, M. B. (2009). *Shop class as Soulcraft: An inquiry into the value of work*. New York: Penguin Press.

Darder, A. (2010). Preface. In R. Kahn (Ed.), *Critical pedagogy, ecoliteracy, & planetary crisis: The ecopedagogy movement* (pp. ix–xvii). New York: Peter Lang.

Denzin, N. K. (2001). The seventh moment: Qualitative inquiry and the practices of a more radical consumer research. *Journal of Consumer Research, 28*(2), 324–330.

Dobson, A. (2003). *Citizenship and the environment*. Oxford, England: Oxford University Press.

Doren, L. (2009, May 13). *Story of stuff, the critique part 1 of 4, Lee Doren*. [YouTube]. Retrieved from https://www.youtube.com/watch?v=c5uJgG05xUY

Eastwood, L. (2006). Contesting economic order and media construction of reality. In S. Best & A. J. Nocella II (Eds.), *Igniting a revolution: Voices in defense of the earth* (pp. 114–126). Oakland, CA: AK Press.

Edwards, R. (2011). Translating the prescribed into the enacted curriculum in college and school. *Educational Philosophy and Theory, 43*(S1), 38–54. doi:10.1111/j.1469-5812.2009.00602.x.

Elshof, L. (2005). Teacher's interpretation of sustainable development. *International Journal of Technology and Design Education, 15*(2), 173–186. doi:10.1007/s10798-005-8277-1.

Elshof, L. (2006). Productivism and the product paradigm in technological education. *Journal of Technology Education, 17*(2), 18–32.

Elshof, L. (2009). Toward sustainable practices in technology education. *International Journal of Technology and Design Education, 19*(2), 133–147. doi:10.1007/s10798-008-9074-4.

Farahmandpur, R. (2010). Teaching against consumer capitalism in the age of commercialism and corporatization of public education. In J. Sandlin & P. McLaren (Eds.), *Critical pedagogies of consumption: Living and learning in the shadow of the shopocalypse* (pp. 58–66). London, England: Routledge.

Fensham, P. J. (1988). Approaches to the teaching of STS in science education. *International Journal of Science Education, 10*(4), 346–356.

Foster, J. B. (2002). *Ecology against capitalism*. New York: Monthly Review Press.

Frantom, P. (2009, August 3). The story of stuff. [Letter]. *Chemical and Engineering News, 87*(31), 4. Retrieved from http://cen.acs.org/articles/87/i31/Story-Stuff.html

Freire, P. (1985). Reading the world and reading the word: An interview with Paulo Freire. *Language Arts, 62*(1), 15–21.

Freire, P. (2000). *Pedagogy of the Oppressed* (30th Anniversary ed.). (M. B. Ramos, Trans.). New York: Continuum International.

Fuad-Luke, A. (2009). *Design activism: Beautiful strangeness for a sustainable world*. London: Earthscan.

Giraffe Innovation. (2015). *Changing habbits*. Retrieved from http://www.changinghabbits.co.uk/

Giroux, H. A. (1988). *Teachers as intellectuals: Toward a critical pedagogy of learning*. Granby: Bergin & Garvey.

Giroux, H. A. (2005). Cultural studies in hard times: Public pedagogy and the challenge of neoliberalism. *Fast Capitalism*, *1*(2). Retrieved from: http://www.uta.edu/huma/agger/fastcapitalism/1_2/giroux.htm

Giroux, H. (2015, April 17). Disposable youth. *Ideas*. [CBC Radio Broadcast: SPUR lecture and interview in Toronto]. Retrieved from: http://www.cbc.ca/radio/ideas/disposable-youth-1.3036140

Giroux, H. A., & Pollock, G. (2010). *The mouse that roared: Disney and the end of innocence* (Updated & expanded ed.). Lanham: Rowman & Littlefield.

Greene, M. (2000). *Releasing the imagination: Essays on education, the arts, and social change*. San Francisco: Jossey-Bass.

Hodson, D. (1992). Politicizing environmental education. *Crucible, 23*, 14–19.

Hodson, D. (1994). Seeking directions for change: The personalization and politicization of science education. *Curriculum Studies, 2*(1), 71–98. doi:10.1080/0965975940020104.

Hodson, D. (1999). Going beyond cultural pluralism: Science education for sociopolitical action. *Science Education, 83*(6), 775–796. doi: 10.1002/(SICI)1098-237X(199911)83:6<775::AID-SCE8>3.0.CO;2-8

Hodson, D. (2003). Time for action: Science education for an alternative future. *International Journal of Science Education, 25*(6), 645–670. doi:10.1080/09500690305021.

Hoechsmann, M. (2007). Advertising pedagogy: Teaching and learning consumption. In D. Macedo & S. R. Steinberg (Eds.), *Media literacy: A reader* (pp. 653–666). New York: Peter Lang.

Hoechsmann, M. (2010). Rootlessness, reenchantment, and educating desire: A brief history of the pedagogy of consumption. In J. Sandlin & P. McLaren (Eds.), *Critical pedagogies of consumption: Living and learning in the shadow of the shopocalypse* (pp. 23–35). London: Routledge.

Huckle, J. (2010). ESD and the current crisis of capitalism: Teaching beyond green new deals. *Journal of Education for Sustainable Development, 4*(1), 135–142.

Jenkins, E. W. (1992). School science education: Towards a reconstruction. *Journal of Curriculum Studies, 24*(3), 229–246.

Jensen, B. B. (2004). Environmental and health education viewed from an action-oriented perspective: A case from Denmark. *Journal of Curriculum Studies, 36*(4), 405–425.

Jickling, B. (1992). Why I don't want my children educated for sustainable development. *Journal of Environmental Education, 23*(4), 5–8. doi:10.1080/00958964.1992.9942801.

Jickling, B. (1994). Studying sustainable development: Problems and possibilities. *Canadian Journal of Education, 19*(3), 231–420.

Jickling, B. (2005). Sustainable development in a globalizing world: A few cautions. *Policy Futures in Education, 3*(3), 251–259.

Jickling, B., & Spork, H. (1998). Education for the environment: A critique. *Environmental Education Research, 5*(3), 309–28.

Jickling, B., & Wals, A. E. J. (2008). Globalization and environmental education: Looking beyond sustainable development. *Journal of Curriculum Studies, 40*(1), 1–21. doi:10.1080/00220270701684667.

Jickling, B., & Wals, A. E. J. (2012). Debating education for sustainable development 20 Years after Rio: A conversation between Bob Jickling and Arjen Wals. *Journal of Education for Sustainable Development, 6*(1), 49–57. doi:10.1177/097340821100600111.

Kahn, R. (2008a). From education for sustainable development to ecopedagogy: Sustaining capitalism or sustaining life? *Green Theory & Praxis: The Journal of Ecopedagogy, 4*(1), 1–14. doi:10.3903/gtp.2008.1.2.

Kahn, R. (2008b). Introduction. *Green Theory & Praxis: The Journal of Ecopedagogy, 4*(1), i–iv. doi:10.3903/gtp.2008.1.1.

Kahn, R. (2010a). *Critical pedagogy, ecoliteracy, & planetary crisis: The ecopedagogy movement*. New York: Peter Lang.

Kahn, R. (2010b). Producing crisis: Green consumerism as an ecopedagogical issue. In J. Sandlin & P. McLaren (Eds.), *Critical pedagogies of consumption: Living and learning in the shadow of the shopocalypse* (pp. 47–57). London: Routledge.

Kaufman, L. (2009, May 10). A cautionary video about America's 'stuff'. *New York Times.* Retrieved from http://www.nytimes.com/2009/05/11/education/11stuff.html?_r=2&pagewanted=print

Keirl, S. (2007). Critiquing in a democracts of design and technology education. In J. R. Dakers, W. J. Dow & M. J. de Vries (Eds.), *PATT 18: Pupils attitudes towards technology international conference on design and technology educational research* (pp. 306–312). Glasgow: Faculty of Education, University of Glasgow. Retrieved from http://www.iteea.org/Conference/pattproceedings.htm

Lahaye, M. C. (1995, Spring). The consumer and green products. *Ecodecision, 16*, 60–62.

Langer, B. (2002). Commodified enchantment: Children and consumer capitalism. *Thesis Eleven, 69*, 67–81.

Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Cambridge, MA: Harvard University Press.

Latour, B. (2004). Why has critique run out of steam? From matters of fact to matters of concern. *Critical Inquiry, 30*(2), 225–248.

Layton, D. (1988). Revaluing the T in STS. *International Journal of Science Education, 10*(4), 367–378.

Lee, J. C.-K., Williams, M., & Stimpson, P. (2015). Preface by the series editors. In R. Jucker & R. Mathar (Eds.), *Schooling for sustainable development in Europe: Concepts, policies and educational experiences at the end of the UN decade of education for sustainable development* (pp. v–vii). Springer: Cham.

Leonard, A. (2007a). *The story of stuff* [Video]. Retrieved from http://www.storyofstuff.org/movies-all/story-of-stuff/

Leonard, A. (2007b). *Story of Stuff* [Referenced and annotated script]. Retrieved from http://www.storyofstuff.org/2011/03/14/story-of-stuff/

Leonard, A. (2012, March 30). The iPhone and consumer guilt. *The Huffington Post.* Retrieved from http://www.huffingtonpost.com/annie-leonard/the-iphone-and-consumer-g_b_1391324.html?ref=tw

Leonard, A., & Conrad, A. (2010). *The story of stuff: The impact of overconsumption on the planet, our communities, and our health—and how we can make it better*. New York: Free Press.

Leonard, D., Frankham, J., & Bragg, S. (2003). Consuming children: Education-entertainment-advertising—Kenway & Bullen. [Book Review]. *British Journal of Sociology of Education, 24*(4), 515–526.

Levitas, R. (1997). Educated hope: Ernst Bloch on abstract and concrete utopia. In J. O. Daniel & J. Owen (Eds.), *Not yet: Reconsidering Ernst Bloch* (pp. 65–79). New York: Verso.

Loving, C. C., Lowy, S. W., & Martin, C. (2003). Recognizing and solving ethical dilemmas in diverse science classrooms. In D. L. Zeidler (Ed.), *The role of moral reasoning on socioscientific issues and discourse in science education* (pp. 183–194). Dordrecht, NL: Kluwer Academic Publishers.

Margolin, V. (1998). Design for a sustainable world. *Design Issues, 14*(2), 83–92.

Martens, L. (2005). Learning to consume—consuming to learn: Children at the interface between consumption and education. *British Journal of Sociology of Education, 26*(3), 343–357. doi:10.1080/01425690500128882.

McCoy, K. (2003). Good citizenship: Design as a social and political force. In S. Heller & V. Vienne (Eds.), *Citizen designer: Perspectives on design responsibility* (pp. 2–8). New York: Allworth Press.

McDonough, W., & Braungart, M. (2002). *Cradle to cradle: Remaking the way we make things*. New York: Northpoint Press.

McGhee, P. E. (1989). The contribution of humor to children's social development. *Journal of Children in a Contemporary Society, 20*(1–2), 119–134. doi:10.1300/J274v20n01_09.

McGregor, S. L. T. (2010). Politicizing consumer education: Conceptual evolutions. In J. Sandlin & P. McLaren (Eds.), *Critical pedagogies of consumption: Living and learning in the shadow of the shopocalypse* (pp. 122–133). London, Eng: Routledge.

Ministry of Education [MoE]. (2007a). *The Ontario curriculum grades 1–8: Science and technology*. Toronto: Queen's Printer for Ontario. Retrieved from https://www.edu.gov.on.ca/eng/curriculum/elementary/scientec18currb.pdf

Ministry of Education [MoE]. (2007b). *Shaping our schools shaping our future: Environmental education in Ontario schools.* Toronto: Queen's Printer for Ontario.

Molnar, A., Boninger, F., Wilkinson, G., & Fogarty, J. (2010). Schools inundated in a marketing-saturated world. In J. Sandlin & P. McLaren (Eds.), *Critical pedagogies of consumption: Living and learning in the shadow of the shopocalypse* (pp. 83–96). London: Routledge.

Nicholson, M., Last, A., & Widell, N. (2012). Response to 'gaps and silences'. *Critical literacy: Theories and practices, 6*(1), 75–79.

Noddings, N. (2010). Moral education in an age of globalization. *Educational Philosophy and Theory, 42*(4), 390–396. doi:10.1111/j.1469-5812.2008.00487.x.

Olson, D. R. (1989). On the language and authority of textbooks. In S. de Castell, A. Luke, & C. Luke (Eds.), *Language, authority and criticism: Readings on the school textbook* (pp. 233–244). London: Falmer Press.

Orr, D. W. (2004). *Earth in mind: On education, environment, and the human prospect*. Washington, DC: Island Press.

Packard, V. (1960). *The waste makers*. New York: David McKay Co., Inc..

Pavlova, M. (2015). Design and technology education for sustainable futures: In preparation for global citizenship. In K. Stables & S. Keirl (Eds.), *Environment, ethics and cultures: Design and technology education's contribution to sustainable global futures* (pp. 87–99). Rotterdam, NL: Sense Publishers.

Pedretti, E. (2003). Teaching science, technology, society and environment (STSE) education: Preservice teachers' philosophical and pedagogical landscapes. In D. L. Zeidler (Ed.), *The role of moral reasoning on socioscientific issues and discourse in science education* (pp. 219–239). Dordrecht, NL: Kluwer Academic Publishers.

Pedretti, E., & Hodson, D. (1995). From rhetoric to action: Implementing STS education through action research. *Journal of Research in Science Teaching, 32*(5), 463–485.

Pedretti, E., & Nazir, J. (2011). Currents in STSE education: Mapping a complex field, 40 years on. *Science Education, 95*(4), 601–626. doi:10.1002/sce.20435.

Petrina, S. (2000a). The political ecology of design and technology education: An inquiry into methods. *International Journal of Technology and Design Education, 10*(3), 207–237.

Petrina, S. (2000b). The politics of technological literacy. *International Journal of Technology and Design Education, 10*(2), 181–206.

Pilloton, E. (2009). *Design revolution: 100 products that empower people*. New York: Metropolis Books.

Pitt, J., & Heinemeyer, C. (2015). Introducing ideas of a circular economy. In K. Stables & S. Keirl (Eds.), *Environment, ethics and cultures: Design and technology education's contribution to sustainable global futures* (pp. 245–260). Rotterdam: Sense Publishers.

Riley, C. (2003). The cultural influence of brands: In defense of advertising. In S. Heller & V. Vienne (Eds.), *Citizen designer: Perspectives on design responsibility* (pp. 70–81). New York: Allworth Press.

Rose, R. (1991). What is lesson-drawing? *Journal of Public Policy, 11*(1), 3–30.

Saltman, K. J. (2005). *The Edison schools: Corporate schooling and the assault on public education. [Ebook]*. Florence, KY: Routledge.

Sandlin, J., & McLaren, P. (2010). Exploring consumption's pedagogy and envisioning a critical pedagogy of consumption – living and learning in the shadow of the shopocalypse. In J. Sandlin & P. McLaren (Eds.), *Critical pedagogies of consumption: Living and learning in the shadow of the shopocalypse* (pp. 1–19). London: Routledge.

Schnaiberg, A. (1980). *The environment, from surplus to scarcity*. New York: Oxford University Press.

Schor, J. B. (2004). *Born to buy*. New York: Schribner.

Seabrook, J. (1985). *Landscapes of Poverty*. Oxford: Basil Blackwell.

Shaull, R. (2000). Foreword to Pedagogy of the oppressed. In P. Freire (Ed.), *Pedagogy of the oppressed*, pp. 29–34). (trans: Ramos M. B.). New York, NY: Continuum International.

Slade, G. (2006). *Made to break: Technology and obsolescence in America*. Cambridge, MA: Harvard University Press.

Solomon, J., & Aikenhead, G. S. (Eds.). (1994). *STS education: International perspectives on reform*. New York: Teachers College Press.

Sperling, E., Wilkinson, T., & Bencze, L. (2014). We got involved and we got to fix it!: Action-oriented school science. In L. Bencze & S. Alsop (Eds.), *Activist science and technology education* (pp. 365–380). Dordrecht: Springer Press.

Spring, J. (2003). *Educating the consumer citizen*. Mahwah: Lawrence Erlbaum.

Steinberg, S. R. (Ed.). (2011). *Kinderculture: The corporate construction of childhood*. Boulder: Westview Press.

Taylor, E. W. (2008). Transformative learning theory. *New Directions for Adult and Continuing Education, 119*, 5–15. doi:10.1002/ace.301.

Vasquez, V. M. (2014). *Negotiating critical literacies with young children* (10th ed.). New York: Routledge.

Vienne, V. (2003). In a continuous state of becoming: Design responsibility tomorrow. In S. Heller & V. Vienne (Eds.), *Citizen designer: Perspectives on design responsibility* (pp. 244–246). New York: Allworth Press.

Wettergren, Å. (2009). Fun and laughter: Culture jamming and the emotional regime of late capitalism. *Social Movement Studies, 8*(1), 1–15. doi:10.1080/14742830802591119.

Wilkinson, T., & Bencze, L. J. (2015). With head, hand, & heart: Children address ethical issues of design in technology education. In K. Stables & S. Keirl (Eds.), *Environment, ethics and cultures: Design and technology education's contribution to sustainable global futures* (pp. 231–243). Rotterdam, NL: Sense Publishers.

Willis, S. (1991). *A primer for daily life*. [Ebook]. London: Routledge.

Worldmapper. (n.d.). *The world as you've never seen it before*. Retrieved from http://www.worldmapper.org/

Wright, C. (2012). Postcolonial cosmopolitanisms: Towards a global citizenship education based on 'divisive univeralism.' In V. Andreotti & L. M. T. *M. Souza* (Eds.), *Postcolonial perspectives on global citizenship education* [EBook] (pp. 47–67). New York: Routledge.

Yager, R. E. (Ed.). (1996). *Science/technology/society as reform in science education*. Albany: SUNY Press.

Zeidler, D. L., Sadler, T. D., Simmons, M., & Howe, E. (2005). Beyond STS: A research-based framework for socioscientific issues education. *Science Education, 89*(3), 357–377.

Ziman, J. (1980). *Teaching and learning about science and society*. Cambridge: Cambridge University Press.

Zoras, B., & Bencze, L. (2014). Utilizing social media to increase student-led activism on STSE issues. In L. Bencze & S. Alsop (Eds.), *Activist science and technology education* (pp. 365–380). Dordrecht: Springer.

Zuk, B., & Dalton, R. (1998). *Humour and cultural perspectives. Connections '98.* In Proceedings of a faculty conference (4th, Victoria, British Columbia, Canada, May 1998). Retrieved from: http://files.eric.ed.gov/fulltext/ED442613.pdf