The Technological Mediation of Sustainability: Design as a Mode of Inquiry

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ABSTRACT

This paper investigates the possibility that the instrumentally rational nature of late-modernity restricts product design from contributing substantively to sustainability as this form of rationality views technological artefacts in neutral terms and discourages reflection upon the "ends" that technologies serve. The philosophical approach of postphenomenology is proposed as a lens for supporting product design students to address sustainability more substantively as postphenomenology emphasises the "ends" that technologies serve by understanding technologies as being active mediators of the relations people have with their world. A practice-based design research method is introduced, which aims to support design students to engage with postphenomenology *through* the activity of designing. This method involves the creation of conceptual objects that critique technologies and embody alternate values to those that typically drive technological development in late-modernity. Finally, distinctive aspects of the designing process associated with this method are identified that support students to address sustainability in a more substantive manner than late-modernity encourages.

Key Words: Postphenomenology, technological mediation, design.

1. INTRODUCTION

The period of modernity (circa 1500-1980) radically altered human comprehension of the world as traditional, religious understandings of it gave way to scientific understandings, characterised by empiricism and rationalistic thinking (Tarnas, 1993, p. 282). Consequently the world was transformed from being part of "a meaningful and value-filled cosmos [into] a vast aggregate of material objects in causal interactions" (Guignon, 2004, p. 22). As modernity progressed, the notion of progress, specifically economic and technological progress, became a matter of ultimate concern: an end in itself and a path to meaning (Taylor, 2009, pp. 715–716). McGilchrist (2009, p. 176) develops the thesis that during this period, the so-called "left brain hemisphere", associated with rationality, reason, detached analysis, etc. achieved a position of dominance over the "right brain hemisphere", which is associated with emotion, intuition, holism, etc. Hence, instrumental rationality emerged as the dominant form of rationality, which prioritises the selection of efficient, cost-effective and expedient means to achieve desired ends – *without reflecting upon the value of those ends* (Dryzek, 2005, p. 195; Feenberg, 2011, p. 865-867). Technologies are therefore understood in largely neutral terms, which conceals their world-building, world-changing capabilities (Davison, 2001, p 95). The way we comprehend the world however has significant implications for how we perceive the world and engage with it; moreover, we can measure the consequences of how we comprehend the world by what happens to it, and by what happens to us (McGilchrist, 2009, p. 176).

Mounting evidence of unsustainability would suggest that continuing to prioritise the instrumentally rational "left brain hemisphere" in how we comprehend the world—and subsequently develop technologies—may be counterproductive to developing more sustainable ways of living. Despite this however, the dominant approaches to addressing sustainability are themselves instrumentally rational, advocating that technological advancement will pave the way for consumption-heavy lifestyles to continue unabated via the development of increasingly efficient technologies. Consequently, there is a danger of a "rebound effect", which occurs when consumption rises as a result of increased efficiency and reduced consumer costs (Berners-Lee & Clark, 2013, pp. 50–54; Verbeek, 2011, p. 93). Furthermore, the dominant approaches to sustainability tend to prioritise environmental issues such as the depletion and contamination of non-renewable resources, which whilst being undoubtedly critical, is overly simplistic and insufficient for developing more sustainable ways of living. The inter-related symptoms of unsustainability are broader ranging and more complex, incorporating (but not limited to), global poverty, widening economic disparity, the social, physiological and psychological pathologies of overconsumption, loss of cultural diversity, and disempowerment of women and indigenous peoples by development strategies (Davison, 2001, p.2).

2. TECHNOLOGICAL MEDIATION: POSTPHENOMENOLOGY

Considering widespread faith in technological advancement being the solution for addressing sustainability, Paredis (2011) notes that it is remarkable "the articles, books and policy debates on sustainability seldom explicitly draw in a discussion of the nature of technology, how technology influences society, and what this implies for sustainable development" (p.196). To this end, the philosophy of technology is committed to investigating the nature of technology, the consequences of technologies for society and how we should act in relation to technologies (Brey, 2010, p. 42). The approach of "postphenomenology" from the philosophy of technology particularly offers product designers a means of overcoming the instrumentally rational nature of late-modernity by providing a lens for considering the "ends" served by technological artefacts rather than viewing them as end-in-themselves, as tends to be the case in late-modernity. Postphenomenology is rooted in phenomenology but whereas phenomenology philosophically analyses the structure of relations between people and their lifeworld, postphenomenology studies these relations as being human-technology relations (Verbeek, 2011, p. 7). Postphenomenology is "post" to distance itself from the romanticism of phenomenological analyses, which tend to treat "technology" as a whole and consider it to be an alienating force (Rosenberger & Verbeek, 2015, pp. 10–11). Phenomenology therefore often opposes the worlds of science and technology, viewing them as presenting a reduced reality that lacks the richness of what the world actually is (Rosenberger & Verbeek, 2015, p. 11). By contrast, postphenomenology incorporates rather than opposes technologies, refuting the idea that we can "regain access to an original world that is richer in meaning than the world of science and technology" (Rosenberger & Verbeek, 2015, p. 11).

Postphenomenology understands technologies in non-neutral terms, as actively mediating and shaping the relations that people have with their world; the human-technology relation is, therefore, a human-technology-world relation (Ihde, 1995, p. 34). Importantly, postphenomenology views the character of these relations as emerging from the entanglement of subject and object – subjectivity and objectivity do not pre-exist these relations, instead they rely on

each other's possibility for being what they are and continually draw upon each other to be meaningful (Introna, 2008, p. 58). For Verbeek (2006, pp. 368–369) the postphenomenological view that subjectivity and objectivity emerges from technological mediation places technologies at the very heart of ethics because ethics is concerned with how to act and technologies-in-use appear to provide material answers to the question of how to act. Postphenomenology does not assign ethical responsibility solely to people or to objects; rather, moral actions and decisions are co-shaped in the mutual relation that arises between person and object (Verbeek, 2011, p. 58). Technological mediation therefore significantly influences our normative frameworks, values and responsibilities (Verbeek, 2016, pp. 200-201). Understanding technological artefacts in this way behoves those involved in their design to consider the character of the relations that may emerge from technological mediation – and crucially, reflect upon what that character might mean for developing more sustainable ways of living. Furthermore, understanding technological artefacts as mediators of human-world relations helps to overcome the late-modern propensity to largely view sustainability as solely an environmental issue, which allows it be only partially addressed.

3. THE METHOD OF CREATING "INQUIRING OBJECTS"

The design research method of creating "inquiring objects" aims to support design students to postphenomenologically investigate technologies; that is to investigate technologies as non-neutral, active mediators of human-world relations that, when brought into use, shape the character of the relations people have with their world. This method involves transmuting philosophical ideas about technologies into highly conceptual, tangible objects. Creating "inquiring objects" is therefore a form of Research Through Design, an approach that is increasingly being adopted in academic research for the unique contributions that design practice can make to knowledge – this is reflected in a rich and growing body of research in which the construction of objects is central to research activity (Bardzell et al., 2015). The method of creating "inquiring objects" aligns with the approaches of critical design (Dunne, 2005), propositional design (Walker, 2014) and critical making (Ratto, 2011). The creative activity of designing is harnessed to de-emphasise the forms of rationalistic, analytical thinking prevalent in late-modernity, to instead bring contrasting but important forms of understanding to the research process that modernity has neglected. These forms of understanding include subjectivity, intuition, originality, expressiveness, imagination, synthesis, contradiction and personal judgement, etc. (Walker, 2013b, p. 448). It is important to stress that "inquiring objects" are vehicles for learning; they need not function or indeed even be understandable to others and there are no claims of comprehensiveness or completeness. Rather, the objects can be understood as three-dimensional sketches that attempt to probe issues from the literature and encapsulate thoughts, impressions, questions, and aesthetic judgements in tangible forms.

Creating "inquiring objects" particularly aims to support design students in recognising the unconsciously held assumptions they may have about the design of technological artefacts, as even the most inexperienced design students bring deeply ingrained presuppositions to the design process about the nature of products that design educators cannot simply eradicate (Snodgrass & Coyne, 1996, p.87). Unconsciously held assumptions tend to result in incremental changes to how products are designed, rather than the kind of radical re-thinking that addressing sustainability more substantively will require. Moreover, they allow sustainability to be approached via the same instrumentally rational mindset that negatively impacts upon developing more sustainable ways of living. As Sengers et al. (2005, p. 50) note, "our very way of reasoning about the world is based on unconsciously held assumptions and perspectives that strongly condition what we see happening around us before we even begin to reason about it". Creating "inquiring objects" seeks to illuminate unconsciously held assumptions in two main ways. Firstly, the designing process is informed by philosophical ideas about technology that are explicitly critical and secondly, the synthetical nature of design practice allows the practitioner to bring together factors such as function, aesthetics and materials in a creative process of discovery that can illuminate previously unrecognised relationships and connections (Gaver, 2012, p. 942; Walker, 2013b, p. 448).

3.1 Examples of "inquiring objects"

This section presents a small sample of "inquiring objects" from design practice undertaken by the author and a group of undergraduate design students that participated in this study. These objects investigate and problematise aspects of the contemporary digital world. The objects focus upon how personal digital devices and associated

technologies mediate human-world relations that are potentially counterproductive to developing more sustainable ways of living.

Description: *Google Diary* is a leather-bound journal subtly etched with the "Google" logo on its cover. The content of the diary is a search history extracted from the author's Google account covering a period of one year to reflect a traditional diary.

Issues being explored: The increasing use of the internet as a design solution and the significant role that the internet consequently plays in people's personal lives.

Technological mediation: The internet can mediate fragmented, fleeting engagement and unreflective, distracted behaviours, which are unlikely to encourage and support human-world relations that are compatible with developing more sustainable ways of living.

Figure 1: "Inquiring object" entitled *Google Diary*)

Description: *Anaesthesia* is a tablet device and set of earphones placed inside a transparent medication bag.

Issues being explored: The possibility that personal digital devices act as a form of medication to protect people against an unsustainable reality via the opportunities they provide for entertainment and distraction.

Technological mediation: Personal digital devices can mediate soporific human-world relations by detracting from people's experiences of the "real" world, including how they relate to their immediate physical environments and other people in those environments

(Figure 2: "Inquiring object" entitled *Anaesthesia*)

Description: *Transparent Smartphone* is a transparent piece of plastic shaped to resemble a smartphone. An eye and a map of the world is etched onto the plastic.

Issues being explored: The largely unseen "big brother" nature of global digital communications corporations.

Technological mediation: Smartphones can mediate human-world relations that conceal hidden corporate agendas relating to the use of personal data. Smartphone users are therefore vulnerable to the intentions of large global businesses, which are often not compatible with developing more sustainable ways of living.

(Figure 3: "Inquiring object" entitled *Transparent Smartphone*)

4.0 THE DESIGNING PROCESS OF "INQUIRING OBJECTS"

This section reflects upon the process of creating "inquiring objects" to draw out distinctive elements of the process that support design students to address sustainability in a substantive manner. Design process knowledge is defined by Walker (2013, p. 455) as knowledge that is distinctive to designing that cannot be acquired through non-design means. Three key aspects of the designing process were identified from the author's practice: A disruptive designing

process, meaningful engagement with philosophical ideas and a different "end" for design. These themes were corroborated by the experiences of the students and new sub-themes were identified from the students' practice.

4.1 A disruptive designing process

Using design practice to explore and critique how late-modern values such as efficiency, utility, technological advancement and economic growth inform and become manifest in technological artefacts necessitates sourcing and configuring materials that appear incongruous with technology. This incongruence disrupts normal assumptions about design as the familiar is transformed into the strange, allowing the practitioner to see technological artefacts in new ways through a lens of materials, aesthetics and configurations not generally associated with their design. Consequently, a critical distance is created in which the practitioner is supported to consider radical alternatives.

Disruption was experienced by the students in two additional ways. During the initial phase of the project, the students frequently sought clarification that their object need not function in the typical, utilitarian sense, indicating that they experienced difficulties in disregarding late-modern understandings of function. As this tension eased, students reported experiencing a heightened sense of creative freedom, which encouraged new understandings that challenge the late-modern nature of technological artefacts. This finding suggests that despite design being an inherently creative activity, addressing functional concerns can inhibit creativity. Secondly, the students' preconceived ideas about what it means to be a designer created further disruption. Many students struggled to disregard the client-focused nature of design and experienced difficulties in accepting that there were no real or imagined stakeholders specifying the outputs of their designing process – and perhaps importantly, sharing responsibility for them. This resulted in participants appearing to experience a degree of exposure as alternate values to late-modernity began to concretise through the emerging artefacts. This degree of exposure was however advantageous for raising student awareness that values become embodied in the outputs of their practice.

4.2 Meaningful engagement with philosophical ideas

The process of creating "inquiring objects" invites the practitioner to grapple with philosophical ideas (which can be both difficult and time consuming to understand), *through* the activity of designing. Philosophical ideas are therefore contemplated and absorbed in a very different manner compared with more traditional, rationalistic means such as reading, memorisation and writing. By contrast, the activity of designing allows the practitioner to develop understanding of these ideas in a relatively emotional, spontaneous, intuitive, and holistic process that is concerned with aesthetically bringing together ideas from a range of sources, including one's own lived experiences of technologies. The designing process contextualises the abstract philosophical ideas being investigated, which deepens their relevance to design by supporting the practitioner to consider the ideas in terms of specific technologies.

The students experienced meaningful engagement with philosophical ideas in two additional ways. Firstly, the designing process served as an effective means of learning philosophical ideas about technologies as it mitigated against the students feeling "lost" when attempting to learn complex ideas by solely reading literature. Secondly, a sense of empowerment emerged as students felt able to assert and express themselves as critically-aware designers due to their emerging knowledge of the philosophical ideas under investigation.

4.3 A different "end" for design

Like many conventional design processes, creating "inquiring objects" develops transferable, practical designing skills, such as developing making expertise, sourcing appropriate materials, problem-solving and developing creative skills. The process of creating "inquiring objects" however directs these skills towards the development of generative, conceptual objects that represent a different "end" for design, which is that of a beginning. The artefacts look backwards and forwards, simultaneously framing critical questions about how technologies are designed and proposing alternate answers to those questions. These answers are expressed via the artefacts' aesthetic sensibilities, forms, material combinations and patterns of use, which can be interpreted to support the design of technological artefacts that mediate more sustainable human-world relations.

For the students, creating "inquiring objects" also represented a different "end" for design in that the process served to expand their sense of designing for sustainability beyond the design of energy-efficient, marketable products. Instead, students began to recognise that the impact technological artefacts have upon people's daily behaviours and values are critical to addressing sustainability more substantively. Consequently, a heightened sense of ethical

responsibility to "do the right thing" through design emerged, which was rooted in new understandings about the non-neutral ways in which technologies mediate human-world relationships.

5. CONCLUSION

This paper has argued that the philosophical approach of postphenomenology can support the design of technological artefacts that mediate more sustainable human-world relations. The method of creating "inquiring objects" was introduced and distinctive aspects of the designing process were identified that support design students to address sustainability in a more substantive manner than late-modern conventions allow for. This paper concludes therefore that design education can contribute more substantively to addressing sustainability by developing and embedding methods that support students to engage with philosophical ideas about the nature of technology. Importantly, the development of such methods should seek to de-emphasise the modern propensity to favour the rationalistic, analytical side of human nature, which appears detrimental to developing more sustainable ways of living, in favour of emphasising the emotional, intuitive, holistic side of human nature that has been neglected during modernity.

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