What is Design Volition? Implications for Technology Education

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Abstract

Design is a central aspect of technology education and has a prominent position in curricula all over the world, not only in subjects named Design and Technology (and similar) but also in most other technology and engineering subjects, or disciplines. In philosophy, it has been asserted that design *volition* (axiology) has a strong relationship with and in many ways forms the basis of design as a methodological stance. In this paper, therefore, we investigate the affordances of volition/axiology as an integral philosophical component of technology education, specifically in relation to design methodology. The primary philosophical frameworks used as the foundation for this philosophical analysis are the ones presented by Carl Mitcham in his *Thinking through Technology* (1994) and Andrew Feenberg's critical theory of technology. We perform a narrative review of relevant literature. Based on this review, we attempt a clearer definition of the lucid concept of volition/axiology in the literature, as well as explicate relationships and influences between axiology and methodology in which we also review design as societal phenomenon, strong and weak intentionality, determinism, etc. In conclusion, implications for technology education are drawn.

Key Words: Design, Volition, Axiology, Technology Education, Philosophy of Technology

1. INTRODUCTION

Design is a central aspect of technology education and has a prominent position in curricula all over the world, not only in subjects named Design and Technology (and similar) but also in most other technology and engineering subjects, or disciplines. Design lends itself particularly well to philosophical analysis because it is not only a making activity but also a pattern of planning and thinking, described succinctly by Mitcham (2020): "Design […] constitutes a distinctive way of turning making into thinking, engendering not only a special kind of making but also a unique way of thinking" (pp. 78–79). In philosophy, it has been asserted that design *volition* (in philosophy: axiology) has a strong relationship with and forms the basis of design as a methodological stance (Mitcham, 1994; Svenningsson et al., 2022). In this paper, therefore, we investigate the affordances of volition/axiology as an integral philosophical component of technology education, specifically in relation to design methodology. The primary philosophical frameworks used as the foundation for this philosophical analysis are the ones presented by Carl Mitcham in his book *Thinking through Technology* (1994), in which he expounds on a four-

dimensional conception of technology as volition, knowledge, activity, and object, and Andrew Feenberg's critical theory of technology.

The selection of literature was carried out in line with criteria for *narrative reviews*, the object of which is to identify central literature for the topic at hand in relevant databases (e.g. ERIC, Google Scholar, Unisearch) without following a pre-determined protocol (Demiris et al., 2019). Furthermore, we included pertinent literature that was found in reference lists in previously known philosophical and technology educational literature, or the literature found through the searches (cf., Grant & Booth, 2009). The methodology for analysis in this conceptual paper subsequently consisted of philosophical analysis of said selection of literature. The degree of stringency of the philosophical argumentation then ultimately decides the relevance of the review and the analysis (Dusek, 2006; Hospers, 1997).

2. VOLITION AS PRESENTED BY MITCHAM (1994)

Volition, or in philosophical terms axiology, is an ill-defined concept which has not gained so much attention in philosophy as, for example, epistemology, ontology, and metaphysics. Volition basically means the ability or power to decide that you want to do something, for example, solve a problem, and then act upon it and take relevant action. In this context it means the will to do or achieve something with the help of technology. In the philosophical literature, however, volition can mean many things and Mitcham (1994) lists a number of these. Technology as volition could thus be the *will* to, through technology:

- survive or satisfy basic biological needs,
- pursue control or power,
- achieve freedom,
- obtain efficiency,
- be entrepreneurial,
- live and thrive,
- perform charity, temperance, altruism,
- exercise free will and creativity,
- create a vision of ourselves as humans, and
- achieve self-determination (pp. 247–250).

Thus, the human will to technology is both an individual act and a social/societal act, which reflect cultural and societal values. Overall, this means that technology is context dependent and value-laden, and this calls for various ethical analyses of technology (Ankiewicz, 2019; Feng & Feenberg, 2009; Keirl, 2018).

It is here that even the failure to will – incontinence – is important ethically because it may be difficult to translate knowledge into action, and sometimes we know what is right to do but we do not act accordingly. The failure of the will to do what is known to be good could potentially be "solved" by better information and communication, technological fixes, political decisions,

legislation, etc. However, Mitcham asserts that all the way from St. Augustine to modernity, free will has been seen as superior to knowledge, understanding, and reason, which poses challenges when analysing and promoting certain technological solutions, or, conversely, when proposing that humanity must abstain from employing certain technological solutions. This makes technological ethics all the more important (1994, pp. 258–266).

A complication in any discussion of technology, ethics and free will is that it concerns the question of the moral "agency" also of technical artefacts and systems (Kroes & Verbeek, 2014), and thus also issues of technological autonomy, determinism and other related concepts (Hallström, 2022). Mitcham (1994) here bases his discourse on a Heideggerian argument, that understanding technology is essentially a practical activity and that technology in its essence is deeply related to volition; practical knowledge – procedural knowledge in making new technology – is therefore the most fundamental form of human knowledge, and it is closely connected with technological activity and volition. For Heidegger, in Mitcham's interpretation, we can both use technology and be free of it at the same time, thus solving the dilemma of technological determinism and autonomous technology, but it requires both the will to will, and the will not to will, to say both yes and no to technology depending on the situation (1994, pp. 254–258). This latter Heideggerian stance may seem obscure, but it could be translated into the relationships – and tensions – between axiology and methodology in technological design.

3. DESIGN VOLITION: RELATIONSHIPS BETWEEN AXIOLOGY AND METHODOLOGY

The above discussion thus implicates a whole plethora of issues surrounding the human will to technology (and not to will), which may affect technological design in general and designing as a methodology in particular. There are important connections between axiology and methodology that need to be explored, that is, the significance of different axiological aspects of technological design and problem solving for such activities. We will here focus particularly on two of these issues: 1. Questions of how values affect designing and the designer, and 2. To what extent the will or intentionality of said designer can be considered to be decisive in designing, in comparison with values and other societal factors. Issues of determinism will be pertinent in both these problematics.

3.1 Values and design

We have mentioned above that technology is about control and that it is value laden, which aligns with Feenberg's critical theory of technology as one of the prevailing views in the field of philosophy of technology (Achterhuis, 2001; Ankiewicz, 2019). Feenberg (2006, 2009b) contrasts the impact of critical theory of technology with the impact of determinism, instrumentalism and substantivism as the dominant views in the field of technology. He represents the relation between critical theory of technology and these other views in a table or matrix (refer to Table 1) with two axes – a vertical axis (the left column) representing the relation of technology to values, and a horizontal axis (the top row) representing the relation of technology to control or agency (Feenberg, 2006, 2009a, 2009b).

Table 1. The relation between critical theory of technology and other views (Feenberg, 2006, 2009a, 2009b)

Technology is	Autonomous	Humanly controlled
Neutral (complete separation of means and ends)	Determinism (e.g. modernisation theory)	Instrumentalism (liberal faith in progress)
Value-laden (means form a way of life that includes ends)	Substantivism (means and ends linked in systems)	Critical theory (choice of alternative means-ends systems)

Table 1 indicates that critical theory of technology shares traits with both instrumentalism and substantivism. Like instrumentalism, critical theory asserts that technology is in some sense controllable, but it also agrees with substantivism that technology is value-laden. This appears to be a precarious position since, in the substantivist view, the values embodied in technology such as efficiency and domination are precisely what cannot be controlled (cf., Ellul, 1964). Critical theory is sceptical about the capacity of human beings to get technological civilisation under reasonable control. It can, however, be reasonably controlled by being submitted to a more democratic process of design and development, also referred to as democratic intervention (Feenberg, 2006, 2009b). In this sense, critical theory of technology in Feenberg's version has developed into a critical, yet rather optimistic, view of design and technology development, provided democratic conditions prevail (Achterhuis, 2001; Ankiewicz, 2019; Hallström, 2022).

Critical theory thus develops Mitcham's (1994) conception of volition and holds that the values embodied in technology, referred to as technical codes, are socially specific and not adequately represented by such abstractions as efficiency or control evident in the dominant rationality. Technology can frame not just one way of life but many different possible ways of life or alternative rationalities, each of which leads to a different choice of designs and a different range of technological mediation (Feenberg, 2009b). On the one hand values are realised in designs and, on the other hand, design impacts on values (Feenberg, 2009a; Feng & Feenberg, 2009).

Consequently, current technical methods or standards were once broadly formulated as values and have at some time in the past been transformed into the technical codes or social standards reflecting specific social requirements that have shaped design but are taken for granted today. In sociological terms technical codes consequently are values (Riggs & Conway, 1991) and reflect what Feenberg calls secondary instrumentalizations, such as ethical and aesthetic mediations. Secondary instrumentalization involves the power relations or socio-cultural conditions that specify definite designs (Feenberg, 2005, 2009a; Feng & Feenberg, 2009). In critical theory of technology, a technical code directs the selection of a "best" design from a number of design possibilities. Technical codes are at times explicitly formulated as design requirements or policies but are often implicit in culture, training and education and need to be extracted from their context by means of sociological analysis. In either case, the designer should ideally formulate the technical code as a norm directing design (Feenberg 2005, 2009a; Feng & Feenberg, 2009).

3.2 Intentionality and design

If technical codes can be both explicit and implicit, the intentionality of the designer becomes a central concern in design from an axiological point of view. Feng and Feenberg (2009) present three different positions on design volition: 1. Designers as powerful, with a strong intentionality, 2. Designers as constrained, with a weak intentionality, and 3. Designers as embedded in society at large and thus with questioned intentionality. Although the critical theory standpoint leans toward the third of these positions on design volition, Feng and Feenberg still conclude that reality may include all three of them: "The intervention of non-technical influences on design takes the form of external pressures but it is also internal to the technical sphere itself. What appears technically rational to the designer is a function of many things, including her training and the codified outcomes of technological choices made in the past under various social influences. In other words, even when engaging in 'purely technical' activities, designers are guided by rules that are culturally specific and value-laden" (2009, p. 110).

Design is therefore a societal activity implicitly or explicitly codified by historical choices, at the same time as it is also directed toward the future by being about problem-solving, creativity and innovation (Feenberg 2017). Therefore, both the history and the current state of the art in technology set limits for what can be achieved in design, so there is also a deterministic potential that may lead to unintended consequences of any new technology (Van der Vleuten, Oldenziel, & Davids, 2017; Winner, 1986). This could be both technological determinism and social determinism, depending on what factors dominate (Hallström, 2022). However, Feen and Feenberg (2009) argue that technology is underdetermined, which means that values always determine the design and development of technology through the technical codes. The important thing is for designers and society at large to acknowledge this fact and make sure that technology is developed with good, democratic, and liberating values, as opposed to controlling, oppressive, and undemocratic ones: "Critical theory of technology draws attention to these background assumptions and asks that the researcher take these seriously. Our hope is that by *questioning* technology vigorously we can help open a space for *designing* technology differently" (p. 117).

4. DISCUSSION AND IMPLICATIONS FOR TECHNOLOGY EDUCATION

The philosophical literature on axiology/volition was and is scarce, but Mitcham (1994) goes some way in explicating more clearly what it is and the role it plays in technology development in relation to primarily epistemology/knowledge and methodology/activity. He pinpoints several definitions of volition such as the will to satisfy needs, control, live and thrive, and connects it with power, freedom, efficiency, etc. (pp. 247–250). In recent years, Feenberg has also developed axiological analyses of design in relation to societal and cultural values, as embodied in technical codes. In both Mitcham's and Feenberg's work issues of intentionality, agency, autonomy, values/ethics, determinism, and consequences are dealt with in intricate but convincing philosophical analyses (Mitcham, 1994, 2020; Feenberg, 2005, 2009a, b, 2017). In relation to the aim of this study, both Mitcham and Feenberg thus investigate affordances of volition/axiology for technological design and show that design methodology cannot be construed as a purely "technical" activity but axiological aspects of designers' and society's pursuits influence designing in decisive ways. The relationships between axiology and methodology therefore appear both in the various ways in which the intentionality of the designer takes form

(strong/weak/society), and in the ways values (technical codes) are implicitly or explicitly assigned to or embedded in designs. This paper thus contributes to the field of design, technology, and engineering education by explaining *why* values are important to consider in design, and *why* one cannot assume that a designer can just do what she or he thinks is suitable but that their intentionality/volition might be restricted by various cultural factors.

The philosophical analyses of this paper could, in turn, help develop the way we conceive of, analyse, and teach design in technology education. Feenberg's critical theory of technology and Mitcham's conception of volition support the inclusion of design volition in technology education. A technology education founded on design volition does not reduce technology education to technical education, which is based on determinism and instrumentalism that view technology as value neutral. It will also not fall short of a critical assessment – unlike substantivism – that might explain, for instance, why some technologies, but not others, are developed in a society (Conway and Riggs 1994; Hansen 1997; Martin 2002; Stables 2017). As critical theory of technology aims at uncovering the technical codes – which are biased by the values imposed by the strong intentionality of expert designers – and to change them to the advantage of modern democratic societies (Feenberg 2009a), technology teachers and students need to be explicit about the values involved at all levels of technology and to clarify, justify and debate their choices (Conway and Riggs 1994; McLaren 1997; Pavlova 2005). Students should be given the opportunity to reflect on their explorations of a value-based appraisal of technology in society by identifying the technical codes and allowing their reflections to influence their own approach (or technical code) to design (McLaren 1997). Students should be accorded opportunities to not only act as expert designers, following a strong intentionality approach (Dakers 2005), but also to follow a weak intentionality approach during negotiations with lay designers (cf. Ankiewicz, 2019).

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