

The Design Models We Have Are Not the Design Models We Need

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Whitbeck (1996) presents a design-anchored approach to ethics that provides a way to think about the intersection of instructional design and social justice. While ethics are typically treated as deciding between what is “right” or “wrong,” Whitbeck (1996) explains this is a simplistic view, as ethics are about confronting complex moral problems that require designers to devise responses (design). When critiqued through the lens of accessibility and equity and racial and economic inequalities, areas where present design models fall short become apparent. Ethics as design affords a way to see design models anew and reconsider design practices.

Introduction

The Cooper-Hewitt, Smithsonian National Design Museum held an exhibit called “Why Design Now?” (2010) that showcased solutions and products from various design disciplines addressing major social challenges, demonstrating the role design plays in making the world a better place. Examples included very low-cost adjustable eyeglasses, high-density affordable housing that was also green and aesthetic, solar solutions for electric power in remote locations, furniture made from entirely recyclable material that was also comfortable and aesthetic, and many other solutions and artifacts. In each case, the designer started with a social gap addressed throughout the design and development or manufacturing process, demonstrating how the abstract ideas of “doing good” or “adding value” can be translated into design objectives and realizable results. In the hands of designers, these abstractions became design constraints and specifications—practical visions for improved products and spaces. When ethics are framed in context of design, they become a thing to do and produce, baked into the fabric of designers’ professional practices.

The standard approach to professional ethics is developing a code more often used as an external judgment of an individual’s behavior rather than as considerations or specifications informing design and decision making. This default frame can result in binary reasoning, aiming to distinguish ethical from unethical, or rightness from wrongness. Many professionals do not see a connection to practice beyond avoiding judgments, which translates into a distancing between ethics and practice, even if instructional designers recognize that

many of the design problems worked on are either ethical in nature or include ethical issues—such as equity and inclusion, social justice, and data rights and privacy. While the Code of Professional Ethics from the Association of Educational Communications and Technology (2020) includes statements such as protecting “individual rights of access to materials” (Section 3.1.2), making “reasonable efforts to protect individuals from conditions harmful to health and safety” (Section 3.1.6), and “seek to avoid content that reinforces or promotes gender, ethnic, racial, or religious stereotypes” (Section 3.1.8), none of these standards appear in instructional design models or processes in the field. The “Why Design Now?” exhibit and practices in other design disciplines to reconceptualize ethics through design offer a different way to think about ethics, focusing on solving social problems and dismantling social inequities rather than as a code of conduct.

The absence of ethical considerations in design models present a significant limitation in both the models and mindset as a field resulting in disservices and injustices to learners and educational, organizational, and social systems. An examination of the models summarized in Branch & Dousay (2015) quickly shows no model in the field depicts how values or beliefs influence the design process or where and how ethical considerations arise during design, development, implementation, or evaluation. While injustices may be quite unintentional, they often happen because we do not plan or design for it to be any different. William McDonough (2006), an architect and sustainability designer, explains it this way in a recorded talk:

It's no longer acceptable for us to say this isn't part of our plan... because it's part of our *de facto* plan. It's the thing that's happening because we have no other plan. Then we realize as a culture that we have become strategically tragic."

He continues by exploring how design "is the first signal of human intention" (McDonough, 2006) and is considered inherently optimistic, but often the designs of systems and products do not reflect a sense of optimism. The field of instructional design is at this point in confronting what intent is signaled in our designs, in part through this special issue, and what role instructional design and learning technologies play in either reinforcing and perpetuating or in mitigating injustices and inequalities. Do instructional design practices and designs reflect an optimistic vision for human learning, development, and flourishing, or is there an operant *de facto* plan where these injustices continue to happen because designs do not envision any other way?

The field has started to see re-examination of research in our discipline such as Reeves and Lin's (2020) argument that the research we have is not the research we need. They note how educational technology research "does not have a distinguished record in dealing with local educational problems, much less global ones" (p. 1998) and that research questions should shift from "what works" to "what is the problem, how can we solve it, and what new knowledge can be derived from the solution?" (p. 1998). The author argues not only do research methods require re-examination but design models as well, or perhaps even more fundamentally design practices and philosophies. At present, instructional design models—such as Dick, Carey, and Carey (2003); Morrison, Ross, Kalman, and Kemp (2013); and others covered in the Branch & Dousay (2015) survey—do not prompt problem solving or engagement in complex, seemingly intractable broader social problems. Ironically, these are the very sorts of problems design is particularly well-suited to in its ability to contend with unclear or conflicting desired ends, divergent needs, and diverse stakeholders and inputs. If instructional design models and processes do not reflect a shift to helping to solve complex social problems, then the inequities and injustices happening as a result of educational technology remain the *de facto* plan. Additionally, if design efforts are constrained or exclude broader social issues, it limits the potential for research efforts to change accordingly. A complementary realignment is necessary.

Framing the Problem

In the Smithsonian exhibit, each designer or developer made a series of decisions on whether or not to include

justice and equity in their designs. Those decisions could result in, for example, a pair of glasses that works but is not affordable, thus creating barriers to access, or a pair of glasses that works and is also as affordable as possible, thereby lowering barriers to access. The main difference lies in how the designer framed the problem. Similarly, designers in the field of instructional design make decisions every day that impact a range of outcomes including, but not limited to, learning outcomes. Interviewing instructional designers, Lin (2007) identified several common ethical concerns in practice: copyright, learner privacy and accessibility, diversity, conflicts of interest, and professionalism. How designers frame the problems they are working on determines the nature of the solutions generated (Svihla, 2020), and thus directly impacts what problems designers address—or not. In the instructional design field, the model(s) designers learn and use in practice have significant influence on how the problems are framed, but do these models do justice to the complex problems designers work on in the real world?

Social justice, equity, and accessibility issues arising during the pandemic highlighted how problems instructional designers and educational technologists work on are not limited to learning outcomes but include ethical considerations that should be part of the problem framing to inform the solutions we devise. For example, during the pandemic, over-reliance on synchronous online learning as *the* solution created a conflict between organizational and curricular objectives like instructional continuity and learners' and families' needs and realities where internet access was difficult or impossible. A large number of students do not have internet access at home (Brooks & Grajek, 2020), and many students do not have home environments conducive to learning (online or otherwise) or even necessarily a place to go (Goldrick-Rab et al., 2019). For primary and secondary education, many parents and caretakers were unable to work from home, leaving them with untenable situations of children learning online at home while they had to work outside of the home. These situations disproportionately impacted families of color and lower-income families. Black and Hispanic workers in particular were less likely to be able to work remotely (Gould & Shierholz, 2020). Most workers in the top quartile of income indicated they could work remotely, while only 9.2% of employees in the bottom quartile reported they could work remotely (Gould & Shierholz, 2020), translating into stress and concern about internet and mobile access issues (Vogels et al., 2020).

While schools and universities emphasized instructional continuity, students' and families' lives were upended as millions lost their jobs (Pickert, 2020) and dealt with serious health issues or deaths of loved ones. As schools and universities were going entirely online, frustrations

erupted as many were left out. The *New York Times* front page from March 27, 2020 tells the story in a single snapshot with headlines of “Job Losses Soar” (Casselman et al., 2020) and “Online Class with No Way to Get There” (Stewart, 2020). It was easy to tell students to go home and connect to the Internet, but the reality behind that dictate put students on more unequal footing, exacerbating issues around diversity and equity of access.

Complicating matters, many schools and universities purchased proctoring software, which introduced additional ethical issues around student privacy, discrimination, and data rights (Flaherty, 2020; Kimmons & Veletsianos, 2021). Higher educational technology decisions prioritized enrollments and revenue as chief continuity considerations. College decisions to reopen in Fall 2020 were largely unrelated to COVID-19 infection and mortality rates; rather, politics and fiscal concerns about impact on enrollments played a larger role in decisions on reopening (Felson & Adamczyk, 2021).

As tempting as it may be to try to distance the instructional design field from these decisions and their impacts, instead, designers should carefully consider how to be part of solving the problems. Frankel (1989) observed “society’s granting of power and privilege to the professions is premised on their willingness and ability to contribute to social well-being and to conduct their affairs in a manner consistent with broader social values” (p. 110). The post-COVID-19 world for the instructional design profession is a significant point in time when society’s granting of power and privilege may be quite tenuous, as educational technology implementations and policies were largely executed to serve bottom lines rather than learning or social needs.

Learning Objectives Are Not the Only Objectives

Instructional design models do not frame the problems to include social, economic, and political realities. For example, models regularly frame conversations about technology selection in terms of learning affordances, but technology selection is just as if not more constrained by the socio-cultural context as well. While design models prompt designers to identify entry-level characteristics of learners, describe the context for knowledge transfer, conduct task analyses, etc., the models remain firmly fixed on what Kaufman (2000) categorizes as “micro” level outcomes to the exclusion of broader social issues. In one effort to address these shortcomings, Hodges et al. (2021) used the general ADDIE model and the Morrison et al. (2013) model, but in order to address ethical problems that crop up in practice such as lack of internet access, they had to append a lot of additional considerations in the needs analysis and learner analysis

prompts. They added entirely new sections on contextual analysis and infrastructure analysis as well as integrated accessibility and flexibility considerations throughout design and development stages (Hodges et al., 2021)—in short, an overhaul. By examining current models through two aspects of social justice—accessibility and inclusion and racial and economic inequalities—the field may begin to identify blind spots, examine how those blind spots impact practice, and consider how to reframe the problems designers work on in practice.

Accessibility and Inclusion Issues

One regular ethical consideration often arising in practice is accessibility. By no means is this a new topic in practice, with columns and legal discussions dating back into the 1990s in some instructional design and educational technology journals. However, Rieber and Estes (2017) documented how accessibility is largely ignored in the Dick, Carey, and Carey model and the literature of the field. The Dick et al. (2009) model makes passing mention of compliance with ADA with a single paragraph mentioning accessibility and suggesting instructional designers simply “comply with requirements” (p.197). Out of 690 articles in the research journal *Educational Technology Research & Development*, only six related to people with disabilities. In the Reiser and Dempsey (2012) trends and issues book, only one chapter mentioned accessibility. Although a narrow analysis, this is consistent with other findings from Moore and Ellsworth (2014) who found similar patterns across major journals in the fields and across various topics that can be classified as “ethics.” More recently, Kimmons (2020) similarly notes the top 20 trends in research in our field do not include any focus on social problems anywhere in the list.

A cursory review of other major design models suggests the gap in accessibility noted by Rieber and Estes (2017) persists across most instructional design models. For example, in the Morrison et al. (2013) model, there are only five sentences devoted to accessibility, and these sentences present a troubling perspective:

Although some persons with physical disabilities can participate in regular classes, others cannot . . . A careful analysis of individual abilities should include observation, interviews, and testing. Many learners with disabilities require special training and individual attention. Therefore, an instructional program may require extensive modification to serve such learners appropriately. Specialists [. . .] should be a part of an instructional planning team (p. 57-58).

What is conveyed here is a sort of “not our job” approach to accessibility. In other models included in the Branch and Dousay (2015) survey text, no mention is made about accessibility, and the models do not prompt a practitioner or decision maker to evaluate social issues or needs like access to internet or social and cultural characteristics of learners that should inform technology selection and implementation. The model developed by Dabbagh and Bannon-Ritland (2005) comes closest, with some passing mentions of accessibility considerations and copyright, although most of the accessibility mentions are focused on remote access, not accessibility for users with disabilities. The impression conveyed by a survey of instructional design models is that the field considers accessibility to be a problem someone else solves, despite other design-oriented disciplines adopting design practices and philosophies that integrate accessibility considerations.

Universal design emerged out of a collective effort across various disciplines to develop design standards for making buildings and physical infrastructure more broadly accessible to as many users as possible (Mace et al., 1991; Moore, 2007; Ostroff, 2001; Welch, 1995). In environmental engineering and architecture, the design philosophy of “barrier-free design” emerged in the 1950s, placing an emphasis on removing obstacles for people with physical disabilities. Over time, this design philosophy evolved into “design-for-all” and “lifespan design” with an emphasis on designing products, environments, and communications to be usable by all people to the greatest extent possible. It expanded into fields such as industrial design, and in 1987 the World Design Congress passed a resolution stating designers should factor disability and aging into designs. That year, US architect Ron Mace coined the term “universal design,” and these design disciplines continued to evolve their practices to place more emphasis on better understanding users, user diversity, and how to design flexible products and environments that assume user variability by default. More recently, organizations like the Center for Applied Special Technology, or CAST, adapted the principles of universal design to learning contexts, adding some principles for design that were specific to the design of learning environments and materials.

However, instructional design models and principles remain largely untouched by these and other social developments. Consider the following design principles articulated by the Adaptive Environments Center (now renamed the Institute for Human Centered Design):

- Varying ability is not a special condition of the few but a common characteristic of being human and we change physically and intellectually throughout our lives;

- If a design works well for people with disabilities, it works better for everyone;
- At any point in our lives, personal self-esteem, identity and well-being are deeply affected by our ability to function in our physical surroundings with a sense of comfort, independence and control (Weisman, 1999);
- Usability and aesthetics are mutually compatible.

Contrast these design principles with the excerpts from Dick et al. (2009) and Morrison et al. (2013), which places more emphasis on distinction, exclusion, and separation than it does on inclusion and inherent, natural diversity among learners. Accessibility and inclusion are widespread blind spots in instructional design models and practices, and at a minimum the field can address this through reconsidering these models and how instructional design is taught and practiced.

Racial and Economic Inequalities

In addition to blind spots around accessibility and inclusion, existing instructional design models were born of a time when the learners studied were exclusive and segregated populations. Bradshaw (2018) provides a window into the paradigms and assumptions infusing existing instructional design models. She highlights how, for example, Gagné’s work was developed in a specific context, the military, at a time when the military was still racially segregated—and also specifically de-selected for physical disabilities. She further highlights how commonly-taught works by Skinner, Bloom, and Maslow were published in the same timeframe and social context as major historical civil rights events such as the *Brown v. Board of Education* decision from the US Supreme Court on educational desegregation, the murder of Emmett Till, and Rosa Parks’ refusal to give up her seat on a public bus.

By implication, the learners who were studied in the published research and envisioned in frameworks and models are white or exclusively white, male, and have a specific set of physical capabilities. When these demographics function as hidden defaults in a framework or model, then design activities such as learner analysis fail to prompt important considerations that stem from assuming inherent human diversity. Assumptions about learners may have changed to an extent in more recent years, but instructional design models and processes have yet to reflect this sort of paradigm shift. As a result, the education and training provided to new practitioners in our field—through introductory instructional design courses which rely on traditional instructional design models and processes—do not prompt social, economic, cultural, and racial considerations. This blind spot influences the options and solutions we devise that would be more effective for diverse learners in varying contexts.

Arguably, this is what structural privilege and structural racism, sexism, ableism, and classism looks like in the context of the field's professional practices.

Gray and Boling (2016) note the instructional design and technology field "has not historically focused their view of practice on ethics, instead relying on a more scientific view of practice that artificially limits the designer's interaction with the surrounding society through the artifacts and experiences they design" (p. 969). One of the effects of more scientific models and processes is that they create a dehumanizing disconnect in practice by favoring an abstracted and generalized process and scrubbing the reality that a human designer or team of human designers are making decisions situated in a specific social context. According to Gray and Boling (2016), this "leads us to a place where rigor is placed in processes rather than the character of a designer, and the ethically charged outcomes of a design can be avoided or diminished" (p. 995). In and through these conscious and unconscious choices about how designers represent and frame design, the field collectively fails to address issues of social justice in the products and environments designed and built because social justice has largely been framed out. As the field starts to lay bare this *de facto* design where injustices happen because we do not plan for them to be any different, these status quo processes become no longer acceptable.

Ethics as Design

Caroline Whitbeck (1996), an engineer who studies ethical reasoning in engineering practice and research, advocates for a design-anchored approach she calls "ethics as design." She explores how most ethical problems are very similar to design problems. For example, for both design problems and ethical problems there are rarely uniquely correct solutions. While some responses may be unacceptable, there are likely to be different solutions which are equally acceptable and have different advantages while balancing trade-offs differently. Similar to design, ethics requires synthesis, not purely analysis. Whitbeck (1996) states, "devising a good response requires synthetic reasoning. Ethics has paid more attention to analytic reasoning and the analysis of ethical problems and possible answers to them. Analysis is important but it is not sufficient to devise responses" (p. 2). While ethics are typically treated as deciding between what is "right" or "wrong," Whitbeck (1996) explains this view as a simplistic view because ethics are about confronting complex moral problems that require responses, especially for problems in which no perfect solution without tradeoffs is possible. The need to respond is what makes these problems practical in nature, not philosophical, and what makes them design problems specifically. It is not enough, Whitbeck (1996) argues, to merely evaluate or judge, but "one must devise

possible courses of action" (emphasis in the original; p.9).

The need to devise courses of action and solutions is where design becomes central to addressing issues of social justice as well as other ethical considerations. "The design process," Whitbeck (1996) argues, "highlights the very aspects of the agent's response to moral problems that philosophy and applied ethics have had difficulty illuminating" (p. 10). Whitbeck (1996) provides a way to think about how to infuse ethics and in particular social justice considerations into instructional design. Through this lens of "ethics as design," instructional designers can begin to see design practices anew and reconsider where and how to weave ethics throughout the design process as well as query the processes and models themselves.

In the instructional design discipline, Svihla (2020) describes problem framing, defining it as a process where the designer needs to "take ownership of and iteratively define what the problem really is, decide what should be included and excluded, and decide how to proceed in solving it" (para. 2). Designers produce different solutions primarily because they have framed the problem differently. Thus, where one designer may focus solely on learning outcomes, another designer may see social justice as a dimension of the problem and endeavor to address it throughout the design, development, and/or decision-making process. For example, Ingraham and Boyd (2020) explore integration of social justice into development of learning simulations by reviewing draft designs for any whitewashing and racial stereotyping and revising virtual characters and representations based on this form of reflective design practice. Glaser et al. (2020) discussed adverse effects of virtual reality for learners with motion sickness and the implications for vulnerable populations along with design and development considerations. Yu et al. (2020) suggested design guidelines for more inclusive online learning in four areas: context, content, facilitation, and assessment. These examples demonstrate how designers framed problems not only as learning, but also as social justice problems, turning ethical considerations into design parameters.

Integration of Ethics into Design

In a content analysis of eight design cases, Gray and Boling (2016) identified some common themes of how and where instructional designers incorporated ethics into the design process. One theme, prioritization of constraints, echoes Whitbeck's (1996) approach as well as emphasis on problem framing. Gray and Boling (2016) note "the constraints that the designers and their teams selected dramatically impact the scope of potential outcomes of the design process" (p. 989). Design activities that involve framing the problem and identifying and prioritizing design constraints and specifications are a key leverage

point for ethics integration into the design process. Framing the problem to include access and equity led some schools to select a suite of strategies and technologies and construct a multi-layered solution. For example, some schools chose worked with local public television or radio stations to offer free instruction or leveraging mobile infrastructure for phone- and tablet-based solutions (see for example Rauf, 2020; World Bank brief, 2020, on global use of edtech during the pandemic).

Gray and Boling (2016) also noted how designers or teams facilitated stakeholder input and buy-in, which helps designers reveal assumptions and their own culture and values they bring to the project as well as share design agency in the process for including diverse cultures and values. A process that engages stakeholders is key to enacting ethics in design and to representing diverse, possibly conflicting, values to frame the problem more inclusively. Gray and Boling (2016) also identified designers who acknowledge the design response or product is situated in a specific social context and explore how their design is responsive to this socio-cultural reality through adaptation to context. Designers also highlighted inclusion and access, with multiple points throughout the design process—from learner characteristics to technology selection and materials development—where accessibility considerations can be woven in. Additionally, Gray & Boling (2016) noted designers who emphasized agency of the learner through student-centered instruction, endeavoring to maximize learner agency and autonomy. And finally, some designers articulated a design philosophy as their *modus operandi* or even engaged their collaborators and stakeholders in expressing a shared design philosophy for the project. In these cases, the designers framed their work to include both value statements on personal commitments (such as a commitment to accessibility) as well as statements on how their work is grounded in particular learning theories.

Moore & Griffin (2021) and Moore & Tillberg-Webb (in press) suggest questions and prompts for ethical considerations can be integrated throughout all stages of the design process. They propose approaches where critical questioning and reflection-in-action (Schön, 1983) are woven into each stage of design and development. For example, during the front-end analysis phases, designers can ask critical questions such as: How many learners have access to internet or mobile technology at home?; What accessibility barriers can be anticipated?; What are critical non-instructional needs such as health or safety that should be considered?; What infrastructure assumptions are being made?; And what are the potential benefits and harms? Reflective questions can be integrated throughout the design process, such as during strategy and technology selection decisions that identify diverse learner needs, or materials creation or selection

that include criteria for how accessible or flexible the materials are or whether materials reflect any bias or discrimination. For practitioners who are in a planning or leadership role, front-end needs assessment questions based in Kaufman's strategic planning model (2000), which starts first with identifying societal needs, can help to frame desired impacts on inequalities, discrimination, access, the environment, and other broader social considerations.

As another emerging example in our field, Beck and Warren (2020) developed a framework to guide ethical instructional choices with learning technologies specifically for a K-12 context. Aimed at learning technology selection, the framework was created with teachers through a stakeholder-driven process. Their framework, Ethical Choices for Educational Technology (ECET), emphasizes *both* ensuring "students learn intended mental models of information" *and* "no harm comes to students because of using it." Their process similarly references micro, macro, and meso-level problems and impacts. Across these emerging studies and frameworks, consistent patterns suggest some convergence of ideas: framing problems to include both instructional as well as broader social issues; prioritizing ethical considerations alongside instructional; posing critical questions at every stage of analysis, design, selection, development, implementation, and evaluation; using a process of continual reflection-in-action or iterative evaluation; engaging stakeholders throughout the design process (not just during implementation); and articulating a design philosophy, whether individually or as a project team.

Where Do We Go Next?

While a survey of design models evidences some shortcomings, there is also clearly nascent energy and effort in addressing these gaps. These efforts may yet yield decision-making and design frameworks or guidelines or job aids to support practitioners, even those who are not professionals in our discipline but find themselves in support or decision-making roles. However, this is presently an emergent area at best. If we conclude that the design models we have are not the ones we need, what then?

It may be quite difficult to give up existing models as a field, especially if instructional design continues to place a high value on the systematic reliability of these models, and there are many instances when this is an important consideration, arguably even an ethical one. For example, in military contexts, it is critical to generate reliable, replicable results because lives are at stake—a very clear ethical constraint. So perhaps then it is more desirable to append ethical considerations to existing models in order to preserve what works in existing models. While the

military context may seem the prime example of why this approach might be preferable, it also demonstrates why this approach may not be sufficient. They are currently re-imagining their instructional systems framework, as they recognized there were mistakes and major ethical failures that showed up in the field caused in part by their reliance on systematic planning models. As one architect for the US Army learning strategy described, they were getting very efficient doing the same thing over and over again, continually solving some important problems but also continually solving the wrong problems (J. Ellsworth, personal communication).

Alternatively, the field could endeavor to develop fresh or revised models that situate ethical considerations more explicitly in the fabric of the design process itself. Or, the field could place less emphasis on design models and focus on design practices like problem framing, reflection-in-action, critical questioning, articulating a design philosophy, and engaging stakeholders. The efforts by Beck and Warren (2020) and Moore and Tillberg-Webb (in press) would certainly fall into one or both of these solution types. It is a classic change challenge: does the field iterate through incremental improvements or tear down the existing structures and rebuild, or completely rethink the underlying paradigms, and then worry about what is built on top of those new paradigms?

The military affords an example again of how incremental improvements or complete overhauls are not necessarily distinct options. When the military decided to revisit instructional systems design models, they began with option A but concluded that merely appending new considerations to existing models was not sufficient. This can lead to very uneven ad hoc processes and mixed results, which is to say undesirable results. So, they shifted to option B as an approach. However, they did not throw out the existing models because those models carry important expertise with them, especially for novices who suddenly find training or instructional development part of their job requirements, but they do not have a degree or background in instructional design. Like the questions and challenges raised in this article, so much had changed about the military's operating environment that something fundamentally new was required. An advantage of going back to ground zero (option B) was the ability to start with something fundamentally new as an organizing framework or at least as a core, then draw on existing systematic models to build something new incorporating the best of the existing (J. Ellsworth, personal communication).

Gray and Boling (2017) also suggest that instructional designers engage in critical design. This is not the same as integrating ethics into the design process, rather it is using design to bring awareness to critical issues. For

example, they describe the *Pee Timer* designed to critique the use of surveillance in workplaces. Critical design aims to raise rather than answer questions, as a way to comment on the design itself, on the nature of design, and on the assumptions designers make. In order to do this, designers need the space, opportunity, motivation, and systemic supports to do so. Imagine an exhibit at a professional conference similar to the "Why Design Now?" where professionals in the instructional design field can showcase designs for good as well as critical designs that challenge designers to think by subverting and playing with ideas and assumptions. Other disciplines have also launched broad, collaborative efforts to articulate principles for ethical design, such as engineering through the Institute for Electrical and Electronics Engineers (IEEE). In 2019, IEEE published *Ethically Aligned Design* aimed at addressing ethical concerns around the design, development, implementation, and research of intelligent and autonomous technical systems.

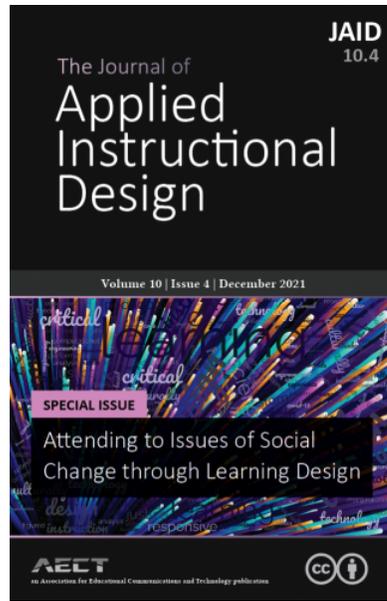
I would like to end with a call for all of the above. By exploring a range of possible solutions and more openly deliberating about design practices, instructional designers can devise a suite of possible responses reflective of different contexts of needs and applications. What is most important is the field start by taking ownership of its role in the undesirable consequences of instructional systems and learning technologies. Instead of merely lamenting the unintended consequences, we signal our intention through design to figure out how we can shape it to be different, in turn also supporting research on how we as a field bring our knowledge and methods to bear on complex social problems.

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