Ethics of Educational Technology

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Stephanie L. Moore and James B. Ellsworth

Abstract

While ethics has been an under-researched area in educational technology, it is receiving current recognition as a critical focus for inquiry and development. In this chapter, we review the contribution of ethics as part of the history of professionalization of the field, the development of a code of ethics for the profession, and contemporary ethics issues like cultural competence, intellectual property, accessibility and universal design, critical theory in educational technology, system ethics, and social responsibility of professionals. In addition, this chapter presents major theoretical and philosophical models for ethics that pertain specifically to technology in educational systems along with implications of research from other fields exploring the integration of ethics into policy, standards, and higher education curricula. Existing research on ethics in educational technology programs suggests a very low level of integration in such domains at present; findings from a survey of the curricular landscape and implications for future research and development are discussed along with consideration of ethics as a foundational component not only to professional standards, practices, and leadership, but also to education policy, as we highlight the role of faculty and graduate programs, practicing professionals, and scholarly associations in shaping future directions and research in this emerging domain.

Keywords

Professional ethics • Ethics as design • Ethics across the curriculum • Social responsibility • Conative domain

Introduction

> "*Neither stability nor change have any intrinsic value. The worth of stability is in the goodness it preserves, while the worth of change is in the goodness it brings about.*"
>
> (Don Ely, 1976, p. 151)

S.L. Moore, Ph.D. (✉)
University of Virginia, Rice Hall 013, 85 Engineer's Way,
PO Box 400235, Charlottesville, VA 22904-4235, USA
e-mail: stephanie.moore@virginia.edu

J.B. Ellsworth, C.P.T., Ph.D.
U.S. Naval War College, ATTN: Code 1GA-4 (Dr. Ellsworth),
686 Cushing Rd., Newport, RI 02841-1207, USA
e-mail: james.ellsworth@usnwc.edu

We must start any conversation on ethics within the discipline of educational technology by underscoring how dramatically understudied this topic has been—and by suggesting that much of this owes to our legacy of viewing ethics as the domain of philosophy rather than action. Yet ethics, properly conceived, are about more than abstract pondering; they are the foundation of the exemplary standards of performance we expect of professionals (Dean, 1993) and thus the necessary precursor to any valid and effective planning and design (Moore, 2010, in press).

Unfortunately, while calls for a more systematic treatment of ethics in our field are increasing, educational technologists today have little to turn to as a robust, well-defined discourse within our own literature. This chapter examines priorities for addressing this gap through development of

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models (including instructional design, instructional systems design, and evaluation frameworks), proposing a synergistic relationship between ethics and research: one that suggests how we can look to the history of the field and the research represented in this very volume as informing professional ethics for the field. Based on this, we advance a framework and research agenda for deepening our discourse and understanding in the ethical domain.

This is only a beginning. If we succeed in our call to action, then this chapter looks dramatically different in future editions, as rigorous investigations of the relationship between our models and theories and the societal impact of our practice become habitual and intertwined through the discourse of our profession.

A Brief History of Ethics in Educational Technology

Attention to the ethics of technology, in general, is a relatively recent phenomenon. Although "techne" has been a part of the human condition since antiquity, it was long considered too worldly for philosophical consideration, and since ethics were the domain of the philosophical, technology and ethics rarely met in discourse over the centuries, even though their narratives are tightly entwined (Scharff & Dusek, 2003). Until the last 100 years or so, when thought was given to technology at all, it was generally assumed to be an inherent good. Under this Positivist paradigm, because technology was viewed as the derivative of science—and science claimed the objective high ground—its products and outputs inherited those same claims to objective virtue. Today, though, we live in a world where a century of unintended consequences—and of their greater transparency to public scrutiny—has recast this faith as naïve. Scanning the popular literature, it might almost appear that the default narrative of technology today is one in which it is inherently bad. These two storylines do daily battle in the headlines: one side is boldly proclaiming "the Internet promises to democratize the world," and the other is whispering "the Internet promises to expose our children to pedophiles."

In between these rival claims is a chasm—one created and widened by our legacy of neglecting any meaningful deliberation on the ethics of technology; it is this chasm that our discipline and many others are seeking to bridge today. Davis (1999) details what he calls the "ethics boom" across disciplines. Thanks to national scandals, technological advances, or poor professional performance, a host of disciplines began to build ethics into college curricula and map ethics-related standards for professional practice.

During this time, the military profession returned to wrestling with the ethical obligations of leadership in war, after civil-military tensions came to a head when President Truman fired General Douglas MacArthur in Korea, and when soldiers under an inexperienced lieutenant massacred Vietnamese civilians at My Lai. Medicine was also among the first to integrate ethics into the curriculum by attempting to define what constituted "practical ethics" or "applied ethics," according to Davis (1999), as physicians confronted increasingly difficult decisions due to technological advances that pitted expensive devices that treated the most ill patients against (for example) building a clinic to serve more people with less serious ailments. Medical faculty worked with faculty in philosophy to develop a new approach to integration of ethics into the curriculum that emphasized ethics as practice or part of a decision making process. The legal profession has faced national scandals like Watergate, which led states to start mandating ethics courses in law programs, and they similarly started developing "practical ethics" as part of the curriculum. Soon after, engineering and science disciplines began to follow suit, following their own scandals ranging from bribery (kickbacks paid by civil engineers to receive preferential treatment in contracts, which ultimately forced the resignation of Vice President Spiro Agnew), to discovery of falsified testing records for airbrakes supplied by B.F. Goodrich for the Air Forice's A7D plane, to the Ford Pinto's exploding gas tank and poorly designed cargo doors on DC-10 aircraft. Similarly, social science disciplines faced an extensive history of cases of mistreatment, deception, abuse, debilitation, or even death of human subjects during research spanning several centuries and occuring in numerous countries. In 1948, the Nuremberg Code was the first international document to establish ethical boundaries for research in social and medical sciences, establishing core principles and practices such as informed consent. Then the boom really took off, as business, accounting, nursing, journalism, financial analysis, public administration, and even dentistry followed suit.

Yet one glaring and curious void in Davis' history of ethics in higher education curricula is the profession of education itself (in general, and educational technology specifically). Although he discusses research ethics extensively, his primary focus is on their application in medical or social science fields like sociology and psychology. Based on Davis' logic, however, that disciplines integrate ethics based on responses to public scrutiny, the time appears at hand for education disciplines to explore ethics beyond just research ethics. *A Nation At Risk* and *No Child Left Behind* reflect increasing national scrutiny of educational systems and teacher preparation, calling into question the value that we add to—or subtract from—our learning systems and society in general. Critics of educational technology such as Cuban (1986, 2003) and Healy (1990, 1999) offer pointed indictments underscoring a perceived failure of technology

to contribute anything worthwhile to teaching and learning, challenging our relevance and therefore our *raison d'etre*. A policy brief from WestEd (2002) poses the question directly:

> Investments in education technology can pose major dilemmas for policymakers. Most agree that in today's world, technology is not a frill but an important part of any modern curriculum. Equally clear, however, is its expense.... Over the last decade, K-12 spending on technology in the United States tripled, now totaling more than $6 billion. Given these realities, policymakers at state and local levels are asking the predictable question: Does this level of spending on technology make a difference in student learning? (p. 1)

This question of "worthwhileness" was raised in several early foundational pieces of the field. Texts republished as "classics" by founding figures in Ely and Plomp (1996)—such as Finn (1996a, original published 1962, 1996b, original published 1953), Davies (1996, original published 1978), and Kaufman (1996, original published 1977; see also Kaufman, Corrigan, & Johnson, 1969)—explicitly focused awareness on ethics for the profession, calling for a professional code of ethics, reflection on the ethical nature of educational technology, and development of assessment models that evaluated societal level impact of educational technology as a profession. According to Davies (1996), while technology and creativity expanded the range of choices available to educators, they also "made it more difficult to foresee the full consequences of the choices made and the actions taken" (p. 15). He states:

> Technology, contrary to popular belief, is not necessarily confined to the *means* by which educators realize their ends. Technology also raises anew questions about the nature of the ends themselves. It forces us to reflect on the morality of what we are about, by its very insistence on defensible choices. … Unfortunately, the deep satisfaction, sense of creativity, and feelings of accomplishment that can be expressed in the *doing* of educational technology are too often preferred to the related, but very different, pleasures of *contemplating* educational technology. Yet contemplation and responsibility go hand in hand, one without the other is meaningless (sic, pp. 15–16).

Emphasizing the importance of a results orientation, Kaufman (1996, reprinted from 1977, 2000) provides a practical way of discussing results (or ends) and societal benefit by framing this discussion in terms of assessment. Kaufman outlines the explicit relationship between what educational technologists do and the ultimate impact of such work on society:

> The simple truth is that what the schools do and what the schools accomplish is of concern to those who depend upon the schools, those who pay the bills and those who pass the legislation. We are not in a vacuum, and our results are seen and judged by those outside of the school—those who are external to it.… This external referent should be the starting place for functional and useful educational planning, design, implementation, and evaluation—if education does not allow learners to live better and contribute better, it probably is not worth doing, and will probably ending up being attacked and decimated by taxpayers and legislators (1996, p. 112).

From Kaufman's perspective, school is not an end but rather a means to an end, for education is ultimately judged by graduates' ability to survive and positively contribute to society. If that is the real end of our efforts, our practices should begin by assessing the "gaps between current outcomes and required or desired outcomes based on external survival and contribution" (p. 112). Thus, according to Kaufman, the practice of educational technology should first begin by determining and justifying what the ultimate *desirable* impacts of our actions are on society and using that as a guide for the design process. Kaufman has developed this over the years into a full framework for assessment that he calls "Mega" (2000), which may very well prove to be a guiding framework for applied ethics in the field given its focus on societal impact. This framework is explored later in the review; here we note that as the field was developing, Kaufman made explicit this question of social responsibility—of the profession's ultimate impact on society—as something that its practitioners must answer to if educational technology was to be a viable, respected profession.

Reinforcing this focus on results, Finn (1996a, original published 1962) asserted that technology is not a collection of gadgets, hardware and instrumentation, but is instead "a way of thinking about certain classes of problems and their solutions" (p. 48). Finn argued that the questions of "what is desirable and why" should be subjects of continual contemplation by the profession. In fact, it was Finn who, in seeking to define the educational technology profession, laid out six traits that characterize any profession, and included ethics among these (1996b, reprinted from 1953):

1. An intellectual technique
2. An application of that technique to the practical affairs of man
3. A period of long training necessary before entering into the profession
4. An association of members of the profession into a closely knit group with a high quality of communication between members
5. A series of standards and a statement of ethics which is enforced
6. An organized body of intellectual theory constantly expanding research

Since Finn's initial advocacy for a professional code of ethics (1953), educational technology's associations have reliably addressed ethics within our profession in this manner. The Division of Audio Visual Instruction (DAVI) of the National Education Association did formalize a code of ethics (Hitchens, 1970; National Education Association, 1975), and this was carried over by the Association for Educational

Communications and Technology (AECT) through the Committee on Professional Ethics. That committee was formally charged with conducting an annual review of the code and adjusting it over the years, and continues to do so today (see Welliver, 2001). Ethics have also been preserved in formal definitions of the field among its essential characteristics. In the 1977 definition reprinted in the opening chapter of Ely and Plomp's *Classic Writings on Instructional Technology* (1996), the authors outline 16 parts, including two reflecting ethics:

> 9. Educational technology has an association and professional communications. There is at least one professional association directly concerned with educational technology—the Association for Educational Communications and Technology. *In addition to facilitating communication among members through its annual convention and three periodic publications*, ***it serves to develop and implement the standards and ethics***, ***leadership***, ***and training and certification characteristics of the profession***. (p. 13, emphasis ours)
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> 11. Educational technology operates within the larger context of society. It advocates being a concerned profession—concerned about the uses to which its techniques and applications are being put. Further, as a profession, it has taken stands in favor of intellectual freedom, in favor of affirmative action, against stereotyping in materials, and in favor of enlisting technology in support of humane and life-fulfilling ends. (p. 13)

The 1994 Seels and Richey definition still included Finn's fifth criterion, but only a page and a half was devoted to how ethics have been addressed since Finn's original publication. The authors recognized that issues like copyright, fair use, and equity were becoming increasingly important. Still, the lack of depth they accorded this topic, and the contemporaneous dearth of citable research or applied work on ethics reveals that this particular "defining characteristic" has gone relatively unexamined for decades.

Despite this prolonged period where educational technology's code of ethics may have risked falling victim to Finn's warning that codes can become mere window dressing, later in the very year that definition was published (1994), a discussion began on the ethic of "social responsibility" that would revitalize one of the codes and suggest a means of making ethics actionable. Based on discussions at the 1994 AECT convention, an entire issue of *Educational Technology* was devoted to the topic of the ethics of the profession. Authors in that edition tackled the topic from a variety of critical theory perspectives including postmodernism and feminism.

Whereas the focus of ethics in educational technology had previously been the individual's behavior and correction where necessary, it was now expanding to include a sense of a professional "social" responsibility. The eleventh part of the 1977 definition that stated "Educational technology operates within the larger context of society" (fully quoted above) had become a formal topic in the literature. Yeaman, Koetting, and Nichols (1994) brought the notion of social responsibility to the fore as they introduced the special issue of *Educational Technology*. Their emphasis was "not on the ethical behavior of individuals, which seems to be the domain of the existing professional codes of ethics, but on the ethical position of educational technology in society" (p. 5). For the authors, social responsibility is an awareness of culture with its intrinsic values and interests and a commitment to basic human rights (p. 10). Social responsibility within educational technology seeks to understand how the profession relates to society, culture, politics, gender, and science and technology in general (Yeaman et al., 1994, p. 10). The authors close with a remark on what is lacking in our field's emphasis on "how to" research and presentations: "there is definitely nothing wrong with liking and advocating educational technology. It is good to find better ways of doing things. Nevertheless, it is important that better should include the qualities of being ethical and more humanizing" (p. 12). This led to changes to AECT's code of ethics to reflect an emphasis on the profession's social responsibility (Yeaman, 2004). Contemporaneously, other associations like the International Society for Performance Improvement (ISPI) began a similar shift in the emphasis of their codes and competencies (Watkins, Leigh, & Kaufman, 2000).

Most of this seminal discussion, however, remained philosophical, approaching the topic through a critical theory lens. With little of it linking results to professional practices, an evidentiary basis for prescribing how one would actually go about addressing ethical outcomes in one's work remained elusive. In one key exception, practitioners in the Human Performance Technology domain of the field have developed a professional certification, the Certified Performance Technologist (C.P.T.), which seeks to address this gap. In moving from a focus on code to one on competencies, the ISPI certification process has started to shift the emphasis of professional ethics to an empirical basis defined by desirable, demonstrable results that can be used to evaluate performance. Furthermore, in addition to competencies related to analysis, design, development, implementation, and evaluation (ADDIE), key authors in this domain have repeatedly called for the inclusion of assessment—which Kaufman (2000) argues is essential to ensuring socially responsible decisions—and ethics in the competencies for certification (Dean, 1999; Guerra, 2001; Stolovitch, Keeps, & Rodrigue, 1999).

The Current State of Affairs: Ethics Across the Curriculum and the Literature

Unfortunately, for a profession that prides itself on its grounding in research and evidence-based theory, educational technologists have very little to guide us, either in

Table 10.1 Count for articles on ethics across educational technology journals

Journal	Number of articles on ethics as of 2011[a]
Educational Technology Research & Development (ETR&D)	39 (since 1950) 4 with ethics as the primary topic; remaining have ethics as a subtopic[b] (1.5 % of articles based on 2,501 total articles since 1950 have some mention of ethics) Of what we deem to be the substantive research and theory in the field, 98.5 % doesn't even mention ethics
TechTrends	111 (since 1980)[c] (4.8 % of articles—based on 2,307 total articles—since 1980 have some mention of ethics)
Instructional Science	12 (since 1970)[d] (1.2 % of articles based on 958 total articles since 1970 have some mention of ethics)
Contemporary Issues in Technology & Teacher Education	52 (since 1997)
International Journal of Educational Telecommunications	9 (since 1997)
Journal of Interactive Learning Research	19 (since 1997)
International Journal on E-Learning	37 (since 1997)

[a]"Ethics" was defined broadly in this search, including articles on ethics, social responsibility, accessibility, copyright, and cultural considerations. No articles specific to research ethics turned up in this search, probably owing to the fact this is a much more general topic affecting many disciplines and therefore appearing in research methodology journals

[b]A majority of these articles focused on application of educational technology in non-US settings. In articles where "ethics" or "social responsibility" were explicitly in the title, the article's focus was still on cultural considerations, suggesting that this is the current predominant conception of ethics in the field. In every instance except one (Lin, 2007), ethics was mentioned as a "need" or a gap but not the actual topic of investigation

[c]An initial search yields 176 articles in *TechTrends*; however, the 111 reported exclude convention reports, calls for proposals, "Datebook" entries, and "Editor's Notes." Of those 111, 11 (10 %) are Paul Welliver's "Ethics Today" series from 1990 to 1995. Twelve are Andrew Yeaman's contributions to that series, and another seven from his 2004 "Professional Ethics" series (17 % of the total articles)

[d]Technically, all articles with any mention of ethics in *Instructional Science* appeared from 1999 onward; no such articles appeared in this journal prior to that year. Further, none of these articles focused on ethics as a primary topic; rather, all gave passing mention to ethics in their discussion of other matters. These trends in treatment are also representative of the remaining journals

considering the ethics of our own practice or in the preparation of our students for contemplating their own. A recent study by Moore (2005, 2009) surveyed faculty and graduate curricula in educational technology programs in the USA and Canada using Kaufman's "Mega" framework mentioned earlier. The survey asked faculty to indicate which dimensions of social responsibility the field currently adds value to and which dimensions it *should be* adding value to that it presently does not. Moore's study also reviewed vision and mission statements for degree and certificate programs in the USA and Canada, as well as curricula (represented by course offerings), to assess the presence of ethics as a subject of study and the degree to which ethics are formally integrated into professional preparation.

Faculty responses to the survey painted a telling story of the current collective disposition towards social responsibility, both as a topic within a course or curriculum and as a guiding ethical framework for the profession. While Kaufman's framework did validate as a comprehensive social responsibility construct (Moore, 2005), of its 13 elements, faculty believed 12 applied rarely or never to their current professional practices. Survey responses did suggest faculty believed that the field should do better in a few of the areas, but even there, ratings of relevance and commitment were relatively low. In short, the findings suggested—and open comments on the survey supported—that faculty in the educational technology field do not perceive a connection between societal level outcomes and what they do or should focus on as scholars in the profession.

Moore concluded, based on these findings as well as implications from her curriculum analysis, that educational technology professionals simply do not have a well-developed schema for considering social responsibility, differentiating between its various elements, or identifying those for which our profession shares responsibility. Her curriculum review of 67 educational technology programs found only 1 in 5 offering any courses reflecting an explicit consideration of ethics, fewer than 1 in 10 declaring ethics among the program's stated objectives, and fewer than 1 in 15 including ethical practice in its vision—even when "ethics" was as broadly defined as possible.

Finally, a current analysis of the educational technology literature reinforces the sense that professional ethics are rarely on our collective mind. In conducting this search, we defined "ethics" as the topic of an article broadly, to include articles on ethics, social responsibility, accessibility, copyright, and cultural considerations—and, based on this definition, counted related articles in the primary research and applied journals in the domain. Table 10.1 summarizes these counts along with notes on each to better assist in interpreting nuances within the articles and data.

Together, such findings begin to paint a troubling picture. It seems clear that, despite the contributions of prominent authors on the topic, such as Yeaman, Nichols, and others

noted above, systematic consideration of the ethics of our professional practice has not diffused throughout educational technology's research, design models, or curricula. What's more, this scant literature's focus on cultural sensitivities and on legal themes like intellectual property, accessibility, and content filtering—issues similar to (or possibly orthogonal to) but not properly part of ethics itself—is typical of constructs around which a collective and individual schema has yet to form (Anderson, 1977; Ormrod, 1999), reflecting the work still to be done in this area.

From Current Themes to Promising Frameworks

This chapter aims to chart some promising pathways toward such a schema, while illustrating how educational technology professionals can reconceptualize existing ethics themes to incorporate a greater focus on measurable results (in accordance with principles long-embraced in other domains of educational practice, such as change facilitation and technology integration and human performance technology). First, we consider a few of the examples noted above, where the lack of a common ethics schema has often led our consideration of ethical issues to veer off into discussion of legal mandates or regulatory compliance.

Intellectual Property and Open Content

Discussions of intellectual property "ethics" in educational technology have most often centered on issues like copyright (law), work-for-hire (law), and similar considerations, where "what is right"—while it may perhaps be obscure to the participants—is grounded in statute or regulation. While important, and while one hopes that laws enshrine practices that are ethical, the ability to conceive of an unethical law—or an illegal act that is nevertheless an ethical obligation—makes it clear that the two constructs are distinct. Losing sight of this distinction can obscure other aspects of intellectual property in our professional practice, however, which are more properly the domain of ethics. Consider one common scenario: a graduate student "co-authors" a presentation at a major conference with a prominent faculty member. The student does virtually all the work, with the senior scholar contributing little more than his name. Yet without that name, a presentation by the unpublished grad student would probably not have been accepted for such an important venue. Who owns the intellectual property? Can the faculty member ethically claim principal authorship to increase the student's likelihood of acceptance?

Another ethical issue related to intellectual property is found in the burgeoning discussion of open content. Open content advocates such as Wiley (2010) argue that society's interests are maximized when intellectual property is shared freely, with proper attribution, for noncommercial purposes. Ironically, this notion of a public interest in the free and open exchange of ideas was the *genesis* of modern copyright law (Ferguson, 2012). It is of special interest in this chapter's context to note that the subtitle of the United States Copyright Act of 1790 was "an Act for the encouragement of learning." And yet, once we set about trying to resolve an issue of ethics using the blunt instrument of law, "over time, the power of the market transformed this principle beyond recognition" (Ferguson, 2012). In short, open content represents an attempt to reclaim a public good that has actually been *subverted* by the legal framework created to protect it, because we have virtually abdicated our reponsibility to oversee that framework within the domain of ethics.

Other frameworks are possible; that is, in fact, the point. Our ethical obligations do not center on "finding the right answer," but rather on *achieving a desirable outcome*—in this case, creating a rich "primordial soup" in which ideas and innovation can flourish, by balancing incentives for content creators with a vibrant public domain in which their creations are accessible to all to drive the next cycle of innovation. Further research is required to measure the contribution of Open Content to this end and to identify and similarly validate other possible frameworks for wrestling with the ethics of intellectual property. Still, Open Content exemplifies the ethical *approach*, by finding its touchstone in this purpose rather than in law and compliance—which are, by definition, means and not ends.

Accessibility and Universal Design

Accessibility and Universal Design have their early roots in the idea of "barrier free design" that emerged in the 1950s across Europe, Japan, and the USA. Like intellectual property, accessibility is among the more common topics associated with the concept of professional ethics in the current literature that exists on ethics in educational technology journals specifically, as noted above. Yet, once again, much of this discussion tends to gravitate toward legal issues—like Americans with Disabilities Act (ADA) compliance—or conflates the term with other concepts (like "having access" to a computer). The literature defines accessibility as the ability of a person with a disability to use an environment—including digital environments—as effectively as people who do not have disabilities (Slatin & Rush, 2003). Clearly—whether we consider children born with congenital disabilities yet active minds, accomplished adults developing a natural disability later in life, or service members wounded in combat—making learning environments accessible to all is an area where educational technologists must play a crucial role if individuals and the society of which they are a part are to benefit. While accessibility can seem a purely technical issue, with emphasis on hardware or software accommodations, such details are better understood as manifestations of design choices and cognitive principles that enable or inhibit socially desirable objectives.

Here, too, we have largely ceded an ethical issue to the domain of law—and here too, this has produced unintended consequences that have undermined the social good being sought. The first time most designers encounter accessibility is when they are told, on the job, that a module or course must be Section 508 compliant. In 1998, Section 508 was added as an amendment to the Rehabilitation Act of 1973, extending the requirement for accessibility of *physical* environments (e.g., buildings and transportation) to cover electronic and information technologies. Unfortunately, legislation by definition promotes a compliance orientation—emphasizing strict adherence to the requirements of the statute, over actually ensuring equal access. For example, in one learning management system, the live collaboration environment is not accessible during the actual meetings, but the recordings from these meetings are made accessible afterwards with subtitles and transcripts from chat windows. While meeting the technical and legal standards of Section 508, this still clearly excludes learners with disabilities *from the main instructional strategy* of live collaboration, relegating them to observers of—rather than participants in—the learning process. Such unintended consequences are consistent with research that suggests compliance-oriented training fails to produce actual changes in behavior or performance, compared to values-oriented training supported and modeled by leadership (Dean, 1993; Harrington, 1991; Trevino, 1987, 1992; Weaver, 1999).

In contrast, in a discussion article on accessibility from an outcomes perspective, Roberts (2003) showed how technical solutions can be informed by the learning sciences to yield *cognitive* access to information and environments. Roberts states that cognitive accessibility is

> the super layer of strategies and methods that help any learner or user understand or cognitively integrate the interface and content. Every user accessing an environment should have the same understanding of how the interface operates and the meaning of any content regardless of form or media. Cognitive accessibility accounts for message and information design behind everything on a website, for example, from an entire interface design down to a specific graphic to ensure those same messages are conveyed through multiple avenues for users accessing the site in different ways. (p. 2)

She describes techniques developed to improve Web site navigation for blind or visually impaired users based on cognitive load theory that improved efficiency of user navigation and allowed users to spend more time on content integration rather than navigation. This sort of technique requires a mindset that goes beyond compliance: one focused on achieving the desired outcomes, for learners both with and without disabilities, through our design choices. To date, however, we have little to no research examining accessibility in light of learning sciences research, or viewing accessibility of digital environments as a cognition question; future research might productively examine the role of design theories or principles in developing learning environments that are truly accessible to all.

A promising approach in recent literature, called "universal design for learning" (UDL) defines the goal more broadly than accessibility. UDL is a design disposition adapted from the more generic principles of "universal design," a term coined by US architect Ron Mace asserting that the design of products, environments and communication should focus on making them usable by all people *to the greatest extent possible* (Fletcher, 2002; Mace, Hardie, & Plaice, 1991). Universal design was adopted as a guiding principle in other design-oriented fields by the World Design Congress in 1987 and has become policy in corporations like Microsoft and Pacific Bell and international organizations such as the United Nations. In recent years, this concept has been imported into education, principally by Rose and Meyer, who assert that "barriers to learning are not, in fact, inherent in the capacities of learners, but instead arise in learners' interactions with inflexible educational materials and methods" (2002, p. vi).

Moore describes UDL as a way of thinking about the design of learning environments that "takes diversity of the learner population into account from the start and builds features into the learning materials, environment, and system that allow a broad set of learners to access the learning (both the content and the instructional strategies) and accomplish learning goals" (2007). This begins to connect UDL to specific Instructional Systems Design (ISD) processes such as definition of learner characteristics, articulation of learning objectives, and message and materials design. UDL encourages a plural definition of learners, with ripple effects throughout other design decisions like clarification of objectives to emphasize learning results rather than means of assessment, selection of appropriate instructional strategies, and development of flexible learning materials. This hypothesized relationship between a broader precept of design for accessible learning and elements of our ISD models suggests another path of ethics research, shaping what we as a profession consider socially responsible design practices.

Access and the Digital Divide

Access, which is distinct from accessibility, has traditionally been defined as physical availability of computer equipment and software and, later, networks—without which it was assumed that society's "digital have-nots" would be shut out from modern citizenship and prosperity, creating a "digital divide." This simplistic understanding of sociotechnical systems assumed that everything else required for computers' effective educational use was already present in the classroom, as it was for blackboards and textbooks. Warschauer (2003)—in one of the definitive texts on the topic—notes that "digital divide" as a construct appears to be waning, as research calls into question not "access," but "access to

what," and whether what learners are accessing is worthwhile. This is a fundamental issue of our profession, as poor design or implementation choices *can* perpetuate social inequalities or even deepen existing ones. The challenge then becomes defining what constitutes a gap in *results* and designing contextually appropriate solutions that close those gaps.

An artifact-based "digital divide" construct proved especially vulnerable to hijacking by the obvious commercial interest of technology providers in selling their products, when it met the traditional legalistic approach. In the 1980s and early 1990s, a legislative and budgetary agenda emerged to get "technology" and connectivity into schools—often with little discernable effect. Yet the relevance of rethinking access is not limited to the "hard technology" aspects of our profession. The mere presence of an educational program of *any* sort does not ensure, and therefore should not assume, positive societal impact. Rather, any societal benefit from educational endeavors is *purposeful*, resulting from intentional objectives that drive their design and align them *toward* that outcome, from the system level down to specific projects and programs.

This is not just the case in developed nations. In its review of the role of education in fragile states (defined as states that are in conflict or crisis), the Inter-Agency Network for Education in Emergencies, as part of a commissioned study for the World Bank, explains how education—depending on how it is implemented—can mitigate *or contribute to* fragility. Employing a scale describing education's impact on fragility—ranging from actively reinforcing or perpetuating it, through inadvertently favoring it, to mitigating against it—INEE's analyses show both the complexity and the criticality of determining impact. For example, in Afghanistan, schools are often attacked by insurgents, owing both to their use as polling places and to education's role in empowering women. Building physical schools can therefore inadvertently *increase* fragility by consuming resources *and* inviting lethal attacks on the community's children and best-educated adults. Radio-based distance education was employed to remove this paradox, enabling safer schooling and measurably reducing fragility (INEE, 2011).

In other settings the learning materials themselves may promote social divides. In Bosnia and Herzegovina, INEE documented biased curricula, textbooks and teacher training that were designed to maintain ethnic and language divisions. These biases reproduced patterns of inequality that ultimately determined outcomes and employment opportunities for students on an ethnically differentiated basis, increasing fragility. Armed with these results, however, the country appears to be reducing these impacts, through more national governance and intentional designs to promote social cohesion (INEE, 2011).

Such examples reveal a layer of design considerations we may not normally confront: how do our designs work with—or *against*—other parts of the educational system to affect learning; how could our choices increase or decrease participants' safety; to exactly what are we providing access—and is that contributing to desirable outcomes, or maintaining *undesirable* ones like social inequalities? These questions challenge us to clarify the actual needs and objectives we pursue—and highlight that *learning* outcomes are not the only results of instructional designs, but rather a subset of the ethical considerations that should inform the design process.

Security and Privacy

Outside conflict-affected nations like those mentioned in the preceding section, safety issues like privacy invasion and identity theft, cyberbullies and sexual predators tend to take center stage—and educational technologists have important roles to play in shaping the design of learning environments that both leverage the capabilities and resources of the Internet for inquiry, problem solving, and growth *and* protect the security of learners of all ages.

Once again, though, our primary response to these challenges has often sought to substitute law for ethics. Legislation has been passed making cyberbullying a crime, in response to widely reported incidents that have even led to fatalities. Inappropriate access to and use of student records has been addressed through the Family Educational Rights and Privacy Act (FERPA). Societal concern over access to age-inappropriate content or exposure of students to exploitation and abuse—sexual or commercial—via the Internet led to passage of the Children's Internet Protection Act (CIPA) and the Children's Online Privacy Protection Act (COPPA) in the opening years of the century. Ethics research and literature in the educational technology field frequently points to the importance of such laws in society's attempt "to balance the safety of children and the rights of adults," and to "balance freedom of speech with freedom from unethical uses of information" (Yeaman, Eastmond, & Napper, 2008, pp. 312–313).

While the serious crimes such laws target ensure them a place in any future strategy, a purely legalistic approach continues to present the shortfalls noted throughout this chapter. Laws against cyberbullying leave unaddressed the ethical responsibilities of educators (including instructional designers) in providing learning environments resistant to the conditions allowing such dynamics to develop in the first place. The requirements of FERPA, while providing important safeguards for student privacy, are also in some instances preventing instructor access to *their own students*' performance data, and obstructing cooperative research studies involving researchers and students from multiple institutions. Statutes like CIPA and COPPA tend to focus on content filters and other (frequently ineffective) technological "solutions," potentially sacrificing attention to the human and social issues and challenges underlying inappropriate

content and risky behaviors online—or to the lessons and critical thinking that are more appropriately the domain of ethics, which could *continue* to protect students after they've graduated into adult life.

Cross-Cultural Competence

A large portion of the literature that does mention ethics focuses on cultural considerations. International collaborations and the introduction of technologies and technological systems into different cultures require additional attention to cultural differences that can affect every part of the instructional design cycle.

The relationship between cultural competence and moral reasoning is perhaps more established than other ethics topics. Endicott, Bock, and Narvaez (2003) examined the relationship between moral reasoning and intercultural sensitivity, finding a strong relationship between participant scores on scales of intercultural development (Intercultural Development Inventory, or IDI) and moral judgment (Defining Issues Test, or DIT) corresponding to participants' depth of multicultural experiences. They offer a cognitive framing of the relationship between moral and intercultural development as an increase in sociocognitive flexibility, which they hypothesize is largely facilitated by multicultural experiences. Hammer, Bennett, and Wiseman (2003) developed the IDI to measure "intercultural sensitivity," hypothesizing that sensitivity is associated with exercising competence. They distinguish "intercultural sensitivity"—which they define as the ability to discriminate and experience relevant cultural differences—from "intercultural competence"—a performance-oriented construct they define as the ability to think and act in interculturally appropriate ways. While the IDI measures five categories of an individual's intercultural sensitivity, as of yet it has not been used to determine whether scores on this inventory predict culturally sensitive behaviors—behaviors that, as the authors articulate them, are worth noting as strongly similar to Mega level outcomes as identified by Kaufman (2000) in our own field (e.g., "lower levels of prejudice and discrimination" and "decreased conflict and/or violence toward people from different cultures" from Hammer et al., 2003, p. 441).

Hammer et al. (2003) suggest that the IDI is "useful for purposes of assessing training needs, guiding interventions for individual and group development of intercultural competence, contributing to personnel selection, and evaluation programs" (p. 441)—language that again should sound very familiar and that suggests ways in which we can begin to translate an abstract concept like "cultural sensitivity" into a performance expectation for professionals and therefore a professional competency addressed through programs and further studied through research. Other disciplines are already integrating this approach into the development of professional practitioners. The US military, increasingly finding itself cast in international humanitarian relief, infrastructure development, and security coorperation roles around the world, is devoting substantial resources and emphasis to cultural competence as a training and performance outcome, although much remains to be done (Alrich, 2008). In academic circles, other disciplines are increasingly emphasizing global awareness. For example, one of the major program outcomes for accreditation in engineering is development of students' ability to "understand the impact of solutions in a global and societal context" (ABET, 2009). Using Bloom's taxonomy, researchers in engineering education have defined learning and performance objectives to support the development of more courses on global and societal impact in more programs around the country (Besterfield-Sacre et al., 2000). This is beginning to show up in engineering both in the curriculum as well as in engineering education journals (Downey et al., 2006; Jesiek, Borrego, & Beddoes, 2010; Moore, May, & Wold, 2012).

A shift towards a definition of "cultural competence" as a professional competency affords our own discipline several opportunities through this framework: an expanded definition of applied professional ethics and framework for discussing existing research in international education as a component of our professional ethics complexion, an existing framework for defining and measuring cultural sensitivity, opportunity to extend existing literature by defining and measuring cultural competence in learning and performance terms to examine the predictive ability of cultural sensitivity measures, a framework for developing courses within programs, and a framework for evaluating graduates of programs as well as projects and project outcomes.

Social Responsibility

Social responsibility is also one of the primary themes identified in what literature exists on ethics, but it is most rightly treated as the overarching concept that authors are converging on—and rather emphatically—as the most appropriate construct for moving discussion (and therefore research, design, and development) beyond codes that focus on individual behavior to a description of the profession's position within society with pervasive influence on practice and research. Ethics have traditionally focused on the individual (an emphasis reflected in the normative ethics research tradition based on cognitive constructs of ethics, such as Kohlberg's theory of moral development, 1969), but the emphasis is shifting to systemic (i.e., global and societal) impact of technological designs and systems (Barbour, 1993; Kaufman, 2000; Moore, 2010; Strijbos, 1998; Yeaman et al., 1994). In this section, we extend this emphasis on social responsibility by looking at the convergence point between four models that heretofore have not conversed with each

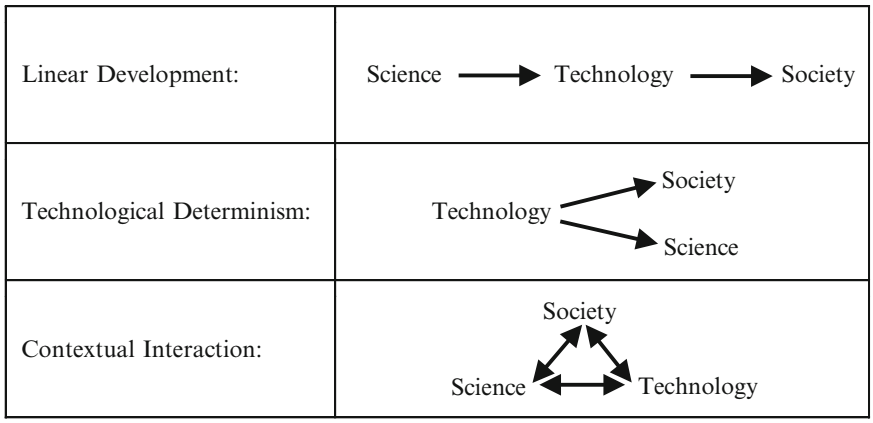

Fig. 10.1 Three views of the Interactions between Science, Technology, and Society (Barbour, 1993, p. 20)

other and the implications of this for future work: Barbour's model of ethics in a technological society, Whitbeck's notion of ethics as design, Kaufman's model for socially responsible planning and design, and Reeves' resurrection of the conative domain. Throughout, we suggest that we are not without a model for how to proceed from here, as we can take a page from the discipline of Science, Technology and Society (STS).

Barbour: Technology as Social Constructions—It Is What We Design It to Be

Barbour's work, *Ethics in an Age of Technology*, provides a strong foundation for a design disposition towards ethics beyond codes and regulations. Barbour examines three differing views of technology: technology is liberating (beneficial), technology is a threat (destructive), or technology is an instrument of power (design and use are defined by context). Based on these three views of technology, Barbour examines assumptions about the relationship between science, technology and society to lay out three different models for thinking about technology and its consequences, advocating for the third "contextualist" model (see Fig. 10.1).

Traditional models are either linear (technology develops out of science) or deterministic (technological requirements drive science and society) and represent what has historically been a dichotomous approach. Linear development models and rhetoric assume that all technological developments have their roots in scientific discoveries and therefore inherit the moral objectivity of the scientific tradition. Determinist models and rhetoric view technology as such a predominantly overarching force that it drives all aspects of society. Common to all variations of deterministic models is the implication that both human freedom and technological choice are limited (Barbour, 1993; Together these two positions also reflect the vast majority of rhetoric on technology: something to be embraced or something to be rejected as a polarized discussion with no real middle ground. The Internet will bring about democracy, or the Internet will expose children to pedophiles.

Barbour argues that instead, there are complex interactions between technology, science and society, where social goals and institutional interests are built into the technical designs we choose. He explains that the third model, with three bidirectional arrows, represents the complex interactions between science, technology, and society:

> Social and political forces affect the design as well as the uses of particular technologies. Technologies are not neutral because social goals and institutional interests are built into the technical designs that are chosen. Because there are choices, public policy decisions about technology play a larger role here than in other views. (p. 21)

Barbour states that many authors/theorists in this third group are still critical of most current technological features but maintain the optimistic belief that technology can be used for humane ends. Those humane ends would be brought about by political measures for more effective guidance within existing institutions or by changes in the economic and political systems themselves. For example, within educational technology, we could develop measures for ensuring decisions and designs are driven by a sense of social responsibility. In order to achieve such an end, Barbour calls for "greater public participation and a more democratic distribution of power in the decisions affecting technology" (1993, p. 16). Other authors such as Andrews (2006) echo this sentiment of engaged "technological citizenship" in which both technical experts and nontechnical experts work together on design and implementation decisions. Pinch and Bijker (1984), developers of the model of social construction of technology (SCOT), would take this a step further to assert that "relevant social groups" *do* influence how new technologies are developed, including input into and modifications of designs, and actively shape policies guiding implementation and diffusion. This is closely akin to the findings of stakeholder involvement in the change literature our field draws from extensively, providing a direct link between that body

of research and ethical practices in educational technology. Participation of end users in every stage of technology development is not only a desirable approach for professionals but is a realistic representation of the social dynamics at play that influence how something develops, whether it is adopted, how and whether it is modified, and so forth.

The essence of this third position is that technical design cannot be meaningfully developed separate from human context. The impact on society and the change it brings about must be considered and *can* be considered. Instead of adopting a reactive position to technology, where we simply accept what is already given, society at large and members of technology professions can (and should) adopt a proactive stance to embed socially responsible values in technological designs (Barbour, 1993, pp. 22–23). To tie this to research in our field, what Barbour effectively argues for is a systemic view of technology that demands stakeholder participation in design and decisions. He lays out a design philosophy that focuses on social responsibility as the prime directive: "I believe that we should neither accept uncritically the past directions of technological development nor reject technology *in toto* but redirect it toward the realization of human and environmental values" (italics in original, 1993, p. 24).

Whitbeck: Ethics as Design

In other design-oriented disciplines, such as engineering, there is increasing recognition that the act of design is also one of developing solutions to meet societal challenges. For example, Whitbeck writes that solving moral problems "is not simply a matter of choosing the 'best' of several possible responses. It is also a matter of *devising* possible responses" (1996, p. 9, emphasis added). She explains that moral problems are practical challenges and bear many striking similarities to another class of practical problems—the design problem. Developing a response to an ethical problem requires one to take multiple considerations into account—and often there is some tension or conflict between these demands. Traditionally, a philosophical approach to ethics would conclude that these are irresolvable conflicts, so a person must "opt" for a solution. However, design processes tend to approach these competing demands as varying needs or constraints that can often be at least partially satisfied through a more considered design. Whitbeck notes, for substantive design problems, that "there is rarely, if ever, a uniquely correct solution or responses" but emphasizes that this is an entirely different claim than saying there are no right or wrong answers. Whereas the latter is an extreme expression of relativism in ethics, the former is a practical approach to ethics offered by design. While there may be no one correct solution or response, it *is* possible to devise—or design—a response or solution that effectively balances the competing requirements.

There are even broader examples in these other fields that can inform our evolving ethical discourse in educational technology. In the field of Science, Technology and Society the literature has long since moved past deterministic models of technology to focus on a design disposition to this question of the ethical consideration of technology: the ethics of any technology lie in our design decisions and our implementation processes. Humanity is not a victim of technology (nor are we necessarily the grand benefactor)—but rather the consequences of a given technology are a result of design and implementation choices. There is a complex interaction effect between technology and culture, one which STS authors term "mutual shaping" or "coshaping" (Neeley, 2010), in which technology simultaneously shapes and is shaped by the culture around it.

When we examine historical examples or look at cross-cultural comparisons, the pattern that really emerges is that technology has been shaped across history and cultures to reflect a culture's emphasis on desired ends. Carlson's seven-volume review of technology across world history paints the most compelling portrait of this design orientation (2005). Historical analyses and cross-culture comparisons of varying technologies and the ways they have developed, or did not develop, or were implemented demonstrate repeatedly that a deterministic narrative of technology is a false narrative—culture, context, and what Carlson calls the "prime directives" of different cultures dramatically influence what technologies are developed, how they are shaped, and how they are implemented.

Kaufman and Reeves: Planning, Design, and Conation

Within our own field we have some excellent building blocks already—but we are only likely to see them as such when we reframe ethics through the design lens. For example, in the area of needs assessment, planning, and evaluation, Kaufman's model for organizational performance presents a robust framework for planning and evaluating multiple levels of impact which includes societal impact. In Kaufman's (2000) model, societal impact is both the basis for planning (a process that starts there then plans "downward" into organizational outcomes, performance outcomes, inputs and processes) and the longitudinal measure of an organization's success (as results at each level align back from the inside out). He presents an operational definition of societal outcomes as well as a framework that assesses and employs societal needs as the basis for design, implementation, and evaluation—in short, one that not merely hopes, but *plans* for ethical outcomes.

Kaufman's model for planning starts with societal level outcomes, which he terms "Mega," and in which he details basic measures of societal impact:

- Zero pollution—no permanent destruction of our environment
- No deaths or permanent disabilities from what is delivered

Table 10.2 The organizational elements, the related results, and definitions used with permission from Kaufman (2000, 2006)

Name of the organizational element	Name of the level of planning and focus	Brief description
Outcomes	Mega	Results and their consequences for external clients and society
Outputs	Macro	The results an organization can or does deliver outside of itself
Products	Micro	The building-block results that are produced within the organization
Processes	Process	The ways, means, activities, procedures and methods used internally
Inputs	Input	The human, physical, and financial resources and organization can or does use

- No starvation and/or malnutrition resulting in incapacity
- No partner or spouse abuse resulting in incapacitating physical or psychological damage
- No disease or disabilities resulting in incapacity
- No substance abuse resulting in incapacity
- No murder, rape, crimes of violence, robbery, or destruction of property
- No war, riot, or terrorism, or civil unrest resulting in incapacity of individuals or groups
- No accidents resulting in incapacity
- Citizen positive quality of life

Kaufman argues that all organizations and all professions either add value to or subtract value from each of these dimensions. Responsible planning and design, thus, treats these as top-priority constraints that can be articulated as higher-order objectives to inform design or planning (Moore, Ellsworth, & Kaufman, 2008, 2011). These measures then also inform an evaluative framework for the societal impact of any given product or process (or Outputs, in Kaufman's model). In Table 10.2 summarizing his model, above, planning or design occurs from top to bottom (reflecting an approach that begins by defining external impact first and is next aligned downward); implementation then proceeds from bottom to top—with evaluation conducted at all levels. An example of this applied in educational institutions is provided by Guerra and Rodriguez (2005) as they followed the positive societal impacts across eleven years from a university that used Kaufman's model for their strategic planning process, with impacts including decreased poverty, decreased crime, and increased employment opportunities in the surrounding community.

Further, in recent years, Reeves has been emphasizing the importance of the little-discussed but highly relevant conative domain (2006, 2011). In the early twentieth century, the conative domain was a generally assumed equal, along with the cognitive and affective domains (McDougall, 1923),

Table 10.3 Comparison of cognitive, affective, and conative domains (adapted from Kolbe, 1990, emphasis ours)

Cognitive	Affective	Conative
To know	To feel	To act
Thinking	Feeling	Willing
Thought	Emotion	Volition
Epistemology	Esthetics	*Ethics*
Knowing	Caring	Doing

with roots stretching back to ancient times. However, from mid-twentieth century onward, it has all but disappeared from the psychology lexicon as cognition dominated learning research. From the Latin word "conation," the conative domain pertains to the act of striving and has to do with intention, will, and drive or desire. Kolbe (1990) provides a summary comparison of the three domains of the mind (Table 10.3).

Reeves laments the complete absence of this domain today in research or practice in teaching, learning and assessment, noting its vitality to students' ability to perform in authentic and global contexts once they graduate (2006). For this chapter, we draw specific attention to "ethics" as part of the conative domain—in the same category as doing, acting, and volition. These are the very same definitions and descriptors often used to define design. Design is a goal-oriented activity that seeks not just to understand, but to produce and act upon a problem. This would imply that the very act of design itself is a manifestation of ethics, and conversely that the most accurate way to discuss ethics is not as contemplation, or knowing, or even as a code that requires a compliant response, but as a goal-oriented activity that requires us to engage sophisticated design processes—just as Whitbeck suggests and as Kaufman exemplifies.[1]

Conclusions

The implications of a design-oriented ethics framework for educational technology research are exciting. Ethics is transformed from the subject of compliance-oriented codes and abstract philosophy into one of action, of leadership of our profession as it seeks and creates its future. Rather than the relationship between ethics and research getting confined to the institutional review board, research becomes the primary informant for ethical practices of our profession, envisioned in a recent research article in *Educational Technology Research & Development*. Towards the end of a study on multimedia principles from Mayer and the "reversal effect" of redundancy for experts, its authors state,

[1] The Smithsonian exhibit "Why Design Now?" as part of their National Design Triennial features a host of examples across disciplines that further reflect this intersection of design and ethics. (McCarty, Lupton, McQuaid, & Smith, 2010)

> If educational technology is not adapted to the human cognitive system, we run the risk of introducing novel procedures that inhibit rather than facilitating (sic) learning. Providing learners with auditory or visual information, or a combination of both, can be highly beneficial but the circumstances in which a benefit is obtained depends on human cognitive factors. (Leslie, Low, Jin, & Sweller, 2012, p. 11)

The body of evidence reflected here in the *Handbook* is a distillation of the best we have to offer to the design of instructional technology products and systems that measurably benefit their users and the society they comprise. This suggests both that we have a firm foundation and broad discourse for deeper integration of ethics into our models and discourse and that we have new avenues of research available to extend this even further. Much of our research retains its primary focus on learning as our chief or only outcome. Yet our professional practices impact far more than learning outcomes; thus our body of research can, and should, expand to examine this full range. Other fields such as medicine, defense, business, and engineering actively discuss the societal implications of new technological developments, not with an eye towards rejecting innovation but rather as a way to actively and collectively make the complex design choices that shape technology towards worthy results.

Kuzma and Tanji (2010), in an extensive review of synthetic biology using a blend of historical and policy analysis, employed research to identify policy problems and lead public oversight, suggesting a continuum of evidence-based policy approaches: preventative, precautionary, permissive and promotion. Yet such analysis benefits not only external audiences like policymakers, but also informs the research and development of the technology. Similarly, Sparrow and Sparrow (2006) examine the implications of humanoid development and specific applications for such technology to eldercare, concluding from an ethical analysis that certain envisioned uses would be detrimental and other applications beneficial – and that the decision space to be navigated demands shaping from policy makers and technologists alike. It may be easy to dismiss these examples as coming from domains that can't assume the same "educational" benefit of our discipline, but consider the ancient wisdom of Quintillian (2006) in his "Institutes of Oratory" in which he lays out an entire system of schooling for young boys in ancient Greece. With the "techne" of writing long debated on an accept/reject basis (with Plato concluding it should be rejected!), Quintillian instead suggested that writing had both value and drawbacks – and therefore its integration into the educational system should be based on how to maximize the benefits and minimize the harm. The effective citizen required both the skill of oratory and the skills of critical reflection & refinement. Writing and revision developed cognitive flexibility and agility – yet the student could spend too much time trying to perfect a written piece, and had instead to cease writing, eventually, and leave his room to speak publicly. The use of each tool, each pedagogy, should be deliberately harnessed to a specified public good. This impacted not just what the young scholars learned in school, but also the type of leaders they grew into – and ultimately the direction of the society they led. It is this very sort of longitudinal perspective that our study and practice of ethics must encourage.

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