Dewey's Ethics of Moral Principles and Deliberation: Extending IEEE's Ethics Initiative for Adaptive Instructional Systems

Jeanine A. DeFalco[1(✉)] and Andrew J. Hampton[2(✉)]

[1] US Army Combat Capabilities Development Command, Soldier Center, Simulation and Training Technology Center, Orlando, FL, USA
`jeanine.a.defalco.ctr@mail.mil`
[2] University of Memphis, Memphis, TN 38152, USA
`Andrew.Hampton@memphis.edu`

Abstract. This paper proposes an expansion of the classical ethical foundations as laid out by the IEEE's Global Initiative on the Ethics of Autonomous and Intelligent Systems that are of particular relevance for developers and interested parties concerned with establishing standards to inform the design and implementation of adaptive instructional systems. *Ethically Aligned Design* [1] argues for the value of integrating the following ethical traditions into either autonomous and intelligent systems public awareness campaigns or engineering or science education programs: virtue ethics, deontological ethics, utilitarian ethics, and ethics of care. Though these traditions cover a broad spectrum of important considerations, they lack specificity for adaptive instructional systems. We argue that an alternative, more manageable and particularly relevant framework should be considered: Dewey's notion of the ethics of moral principles and deliberation. Following from this framework, we also argue for the need to explore education of ethical thinking and related skills through the medium of adaptive instructional systems.

Keywords: Ethics · Artificial intelligence · Adaptive instructional systems · Dewey

> *Especially in times like the present, when industrial, political, and scientific transformations are rapidly in process, a revision of old appraisals is especially needed.*
>
> —John Dewey, *Ethics* (1932)

1 Introduction

1.1 An Exigent Need

Coinciding with the expansion of artificial intelligence and adaptive technology into daily life, we have seen an explosion of concern for the ethical implications surrounding research and development to ensure responsible implementation. However, most of this investigation has focused on the (admittedly valid) areas of existential threat, data privacy, and macroeconomic concerns such as job displacement. In

contrast, minimal effort has focused on the psychological perspective. How do these changes impact our perception of the world and how we interact with it? What price do we pay for these advancements (if such they are)? Have the developers even considered it? How does intelligent adaptivity change our assumptions and the ways in which we approach persistent challenges, such as learning and instruction? Some exploratory efforts have opened the door to broad areas of inquiry from this perspective based on particular applications and issues emanating from them [2]. Though critical to raising awareness and discussion of a substantial research gap, these case studies and thought pieces lack a unified ethical framework in the classical sense. As a result, logical conclusions drawn from bottom-up reasoning may fail to generalize to other domains or edge cases within adaptive instruction.

To address this gap, we propose an expansion of the classical ethical foundations as laid out by the IEEE's Global Initiative on the Ethics of Autonomous and Intelligent Systems that are of particular relevance for developers and interested parties concerned with establishing standards to inform the design and implementation of adaptive instructional systems. In *Ethically Aligned Design* [1], the authors note that there is value to be gained by integrating the following ethical traditions into either Autonomous and Intelligent Systems public awareness campaigns or integrated into engineering or science education programs: Virtue ethics, Deontological Ethics, Utilitarian Ethics, Ethics of Care. Though these traditions cover a broad spectrum of important considerations, they lack specificity for adaptive instructional systems. We argue that an additional, particularly relevant tradition should guide ethical standards, including recommendations for future research and instructional aims for adaptive instructional systems: Dewey's intertwining notions of the ethics of moral principles and methods of deliberation. This dual theoretical and methodological approach highlights the importance of extending learning platforms beyond mere instruments of measuring outcomes, advocating for additional considerations regarding devising conditions that aim at a broader purpose: sustaining democracy and education.

1.2 Standards

As noted by Winfield and Jirotka [3], standards represent either implicitly or explicitly a formalization of ethical principles that can be used to evaluate compliance or provide guidelines for designers on how to reduce the threat of ethical harm that could arise from innovative and novel products or services. IEEE's Global Initiative on Ethics of Autonomous and Intelligent Systems, produced from the work of 13 committees, sets forth guidance on how to embed and guide a range of AI concerns. The work encapsulates over 100 ethical issues and recommendations [3]. Specific objectives include ensuring personal data rights, promoting well-being through economic improvements, devising a legal framework for accountability, ensuring transparency and individual rights, and creating policies for education and awareness. Strategies for realizing these goals vary, but primarily rely on finding consensus principles from which developers, lawyers, or policymakers can make specific determinations. For example, the group advocates broadly inclusive well-being metrics as an objective tool for evaluation, but acknowledge that applications likely involve tradeoffs among various facets of the overarching construct. Similarly, the guidelines encourage value-

based design methodologies aligned with the principle that machines serve human needs and not vice-versa.

The concerns that preoccupy the domain of AI have extended into the corporate domain. A 2018 study (sample population 305) notes that corporate AI adopters, which constitutes 72% of organizations globally, have ethics committees to review the use of AI (63%) and conduct ethics training for technologists (70%). However, their attempts to establish a governing set of ethical standards for AI systems have been oriented towards the notion of "do no harm," while explicitly seeking to develop prescriptive and technical guidelines that are transparent, secure, accountable, and oriented toward human values [4]. Their focus on prescriptive, universal guidelines presents a daunting task, viewed by some as an impossibility. Chatfield [5] argues that the impossibility arises "largely because there's no such thing as a single set of ethical principles that can be rationally justified in a way that every rational being will agree to." Acceding to this substantial difficulty without avoiding the exigent demand for ethical standards, we argue that the scope and orientation of the stated "need" is flawed as a premise.

The fundamental flaw with this premise of seeking to identify a single set of universally applied ethical principles is misguided precisely because the attempt to codify any possible ethical violation is not the answer to avoiding ethical violations. Indeed, the notion that the solution to avoiding ethical violations lay somehow in generating universal, static standards and statutes that will articulate every conceivable *do* and *don't* of ethical dilemmas is, we concede, an impossible task. It is impossible due to the infinite variety of unknown possible combinations of choices and circumstances that our future selves and future generations will devise. This impossibility does not preclude efforts to establish ethical *guidance* to stave off unintended consequences that can be harmful to individuals and society. The answer does not lay in implementing a *prescriptive* approach to devising ethical standards. Rather, as Dewey argues, the solution resides in an ongoing engagement in the establishing and constant re-evaluation of guiding ethical moral principles *and* the methods to continuously inform this guidance framework through cooperative, continual deliberation driven by discriminate intelligence [6].

2 Renewing Philosophical Traditions

2.1 Deweyan Ethical Framework for Adaptive Instructional Systems

We begin with an attempt to contextualize the argument for adoption of Dewey's ethical framework, which consists of values and methods. Dewey's philosophical foundations reside within the school of thought known as pragmatism, which he helped pioneer [7]. Among Dewey's contemporaries (and often attributed as a co-founder of pragmatism) was Supreme Court Justice Oliver Wendell Holmes Jr. The judicial philosophy he crafted from pragmatic principles provides an analogical touchstone for leveraging experience and discriminate intelligence to interpret broad principles (in his case, the Constitution of the United States) in novel circumstances.

Supreme Court Justice William J. Brennan, Jr. was among many justices strongly influenced by Holmes's approach to constitutional interpretation [8]. Brennan noted in his "Text and Teaching" symposium at Georgetown University [9], that the American

Constitution has been and continues to be for Americans "the lodestar for our aspirations" in creating a country "where the dignity and rights of all persons were equal before all authority." Yet, the Constitution is not explicit, or "crystalline" as to how to achieve and maintain these dignities and rights. Brennan notes [9], "[The Constitution's] majestic generalities and ennobling pronouncements are both luminous and obscure. This ambiguity of course calls forth interpretation, the interaction of reader and text." As a Supreme Court Justice, Brennan notes that the "burden" of his judicial career had been "to draw meaning from the text in order to resolve public controversies," [9].

Importantly, Brennan notes the social responsibility of interpreting the Constitution: "When Justices interpret the Constitution they speak for their community, not for themselves alone. The act of interpretation must be undertaken with full consciousness that it is, in a very real sense, the community's interpretation that is sought," [9]. Further, and relevant to this discussion, Brennan notes: "It is the very purpose of a Constitution—and particularly of the Bill of Rights—to declare certain values transcendent, beyond the reach of temporary political majorities," [9], and within the Constitution, there is embodied "substantive value choices; it places certain values beyond the power of any legislature."

There are two elements to highlight here: the first is that the Constitution is not an explicit set of prescriptive and technical guidelines to ensure that dignities and rights are sustained; and secondly, the Constitution's ambiguity requires the *interactive* engagement of the reader with the text. This mirrors precisely Dewey's notions of the ethics of moral principles:

> The fundamental error of the intuitionist is that he is on the outlook for rules which will of themselves tell agents just what course of action to pursue, *whereas the object of moral principles is to supply standpoints and methods which will enable the individual to make for himself an analysis of the elements of good and evil in the particular situation in which he finds himself.* No genuine moral principle prescribes a specific course of action; rules, like cooking recipes, may tell just what to do and how to do it. Moral principles, such as that of chastity, of justice or the Golden Rule, gives the agent a basis for looking at and examining a particularly question that comes up […] A moral principle, then, is not a command to act or forbear acting in a given way: *it is a tool for analyzing a special situation*, the right or wrong being determined by the situation in its entirety, and not by the rule as such [10].

Importantly, Dewey's notion of ethics is less concerned with devising end-state goals regarding supreme ethical principles, but rather focuses his efforts on identifying a method for improving value judgments informed by moral principles [10]. It is important to note that Dewey defined moral principles outside of the constraints of institutional, religious doctrines. A moral principle is not a command, but rather it is a tool for analyzing novel situations [10]. Moral principles are standards that provide a consistent point of view to be taken in ethical deliberation. They leave room for discovery of new understandings of well-being and the future variety of circumstances that will yield even more refined solutions. Moral principles do not predetermine or prescribe precisely what will constitute the common good [10].

Further, Dewey identifies that there are common human values, e.g., belief in the value of human life, care of children, loyalty to tribal and community customs. Dewey notes that there are always opportunities to "widen and deepen the meaning of moral

ideas. The attitude of *seeking* for what is good may be cultivated under any condition of race, class and state of civilization […] The moral quality of knowledge lies not in possession but in concern with increase," and that to restrict moral knowledge and judgement to a definite realm limits our abilities to perceive unanticipated circumstances of moral significance [10]. And Dewey's answer to the methods through which we seek to continuously determine what is good, what is of value, what should define our moral principles resides in his notion of deliberation.

As a pragmatist, Dewey interest was rooted in the importance of employing reflective, discriminate intelligence to revise our judgments as a result of acting upon them—what Dewey termed deliberation. Deliberation, Dewey asserts, includes the "reflections when directed to practical matters to determination of what to do," [10]. Through deliberation, our judgments are formed to redirect actions when habits fall short—particularly in the context of solving novel problems. Essentially, Dewey's meta-ethic of value judgments derived from moral principles, and his notion of deliberation functioned as an iterative expression between thoughts and behaviors in much the same way Brennan [9] maintained we derived guidance from the Constitution to sustain our democracy.

Dewey conceptualized the primary concerns of his era in much the same way we do now—principally, the speed with which technological innovations were changing the landscape of the Western world. Indeed, there are many parallels between the concerns that shaped the philosophy and practical application of education reforms in the face of transformative emerging technologies of the early 20th century, and the concerns we face now. The primary distinction derives not from type but from scale, as the same technologies driving change have ensured global impact. Accordingly, Dewey's ethical framework of moral principles and deliberation, in addition to his overall philosophy of education, are ideally suited for the domain of the emerging field of adaptive instructional systems. Dewey is a particularly relevant figure as we grapple with the limitations and aims that should be integrated in the development and implementation of adaptive instructional systems.

While an established definition of the nature of an adaptive instructional system has yet to be codified and universally accepted, a working definition can be pulled from the ongoing efforts of the Adaptive Instructional Systems IEEE sub-working group (C/LT/AIS) P2247.1: "(adaptive instructional systems) are artificially-intelligent, computer-based systems that guide learning experiences by tailoring instruction and/or recommendations based on the goals, needs, preferences, and interests of each individual learner or team of learners in the context of domain learning objectives. Domains are topical areas of knowledge" [11].

Further, this sub-working group has adopted a working definition of "learning" limited to the field of adaptive instructional systems:

> Learning, within the context of adaptive instruction systems, is defined both within a historical domain framework as informed by John Dewey (1938) as well as by the National Academies of Sciences, Engineering, and Medicine (2018). Accordingly, we are proposing a definition of learning relevant to adaptive instructional systems hallmarked by a continuous process of reconstructing experience (Dewey 1938) that involves lasting adaptions of the learner in response to the interactive effects of external variables and individual factors [11].

Adaptive instructional systems, then, are distinguished from other AI-driven systems because of their aim to support learning. This is an important distinction because the values and ethical principles that should guide design and implementation should similarly be aligned with nature and purpose. It follows then, that if adaptive instructional systems guide learning experiences, then the guiding ethical principles should begin with whether or not the systems actually support learning. That is, does it afford a continuous process of reconstructing experience.

Digging deeper, it is worth reiterating what Dewey said about the moral nature of knowledge, activity, and education:

> What is learned and employed in an occupation having an aim and involving cooperation with others is moral knowledge, whether consciously so regarded or not for it builds up a social interest and confers the intelligence needed to make that interest effective in practice just because the studies of the curriculum represent standard factors in social life, they are organs of initiation into social values. As mere school studies, their acquisition has only a technical worth. Acquired under conditions where their social significance is realized, they feed moral interest and develop moral insight. Moreover, the qualities of mind discussed under the topic of method of learning are all of them intrinsically moral qualities. Open-mindedness single-mindedness, sincerity, breadth of outlook, thoroughness, assumption of responsibility for developing the consequence of ideas which are accepted are moral traits. […] Discipline, culture, social efficiency, personal refinement, improvement of character are but phases of the growth of capacity nobly to share in such a balanced experience. And education is not a mere means to such a life. Education is such a life. To maintain capacity for such education is the essence of morals. For conscious life is a continual beginning afresh. […] learning is the accompaniment of continuous activities or occupations which have a social aim and utilize the materials of typical social situations […] All education which develops power to share effectively in social life is moral [12].

In this passage resides the guiding principle that should inform the ethical considerations of adaptive instructional system: whether the systems we devise and employ support the development of an individual's power to share effectively in social life. This is not to suggest that the traditional ethical foundations identified (i.e., Virtue, Deontological, Utilitarian, Care) identified in the IEEE work are unimportant or inapplicable, but rather Dewey's philosophy of ethics—and importantly, his views on the ethical nature of learning and knowledge—avoids the pitfalls of a merely prescriptive framework and gives us a context from which we can employ deliberation to determine whether adaptive instructional systems begin and support ethical considerations in learning. And this notion of deliberation is key to the Deweyan framework of ethics for adaptive instructional systems for it shifts the discussion from developing a prescriptive, rule-based approach toward a discussion that is rooted in developing the methods for deliberating the ethical aim and purpose of these systems.

It is the methods anticipating and reconciling ethical dilemmas—the continuous deliberation and refinement of values—that should guide the aim and purpose of AI and adaptive instructional systems: "conserving, transmitting, rectifying, and expanding the heritage of values we have received that those who come after us may receive it more solid and secure, more widely accessible and more generously shared than we have received it" [6]. In this way, as educators and policy makers, we need to focus both on developing systems by which we can execute purposeful deliberation of ethical considerations, as well as continue to address fundamental research as to the cognitive skills involved in ethical deliberation, or reasoning particularly as mediated through adaptive instructional systems.

2.2   Rigorous Deliberation and Implementation

This paper will not spend extensive time addressing the nature and scope of developing systems of ethical deliberation. However, irrespective of the ways in which we devise governing bodies, they would be well served by democratic principles that allow participants to safely engage in *parrhesia*.

The ancient Greek concept of parrhesia is defined as telling the truth as one sees it with honesty and integrity [13]. Foucault [14] argued that the qualities that constitute parrhesia are central and essential for both democratic and philosophical identities. These parrhesia qualities include engaging in dialogue, questioning, having a passion for public affairs and human equality, among many others [13]. Parrhesia requires intellectual courage and risk-taking in truth telling and pursuits of inquiry. Burch [13] argued that acts emanating from *parrhesiastic* modes of being are essentially acts of democracy and can be used to develop a coherent framework for democratic pedagogy.

Ancient Athenians eulogized parrhesia as a practice that promoted ideas of egalitarianism and a rejection of hierarchy and limitations set by superiors or history: "To say all, to speak freely was to uncover and thus to question what has been and to ignore the restraints of status," [15]. Burch [13] notes that the penultimate example of a *parrhesiastes* was Socrates: a person who dared to ask questions, expose the truth and contradictions of things, challenging assumptions and authority of the powerful, as well as identifying that which was still unknown. In essence, the speech-acts of parrhesia constitute democratic action, particularly as its original function was to expose and criticize authoritative deception [13].

In short, the parrhesia model can be used to inform the organization of ethical deliberation systems. This effort would begin with first establishing the values and qualities of parrhesia actions that promote and sustain a democratic society. Burch [13], note that these values and qualities include dialogue, questioning, initiative, a sense of equality, a concern for the common good, and passion for public affairs.

Essentially, the first task in devising an effective governing ethical body would include establishing these aforementioned elements of parrhesiastic values into protected procedural policies. In turn, these governing bodies could engage in ongoing deliberation as to whether innovations in adaptive instructional systems were aligned with a Deweyan framework of ethical principles. If learning is a social activity [12, 16], then *prima facie* there can be only limited learning if social activity is oppressively restrained, particularly if there will be retributive consequences for speaking truth to power on ethical issues. By insuring a protected governing body that can deliberate emerging ethical dilemmas driven by innovative AI technologies, we will safeguard the purpose of adaptive instructional systems: to support learning that ensures our systems develop the skills necessary for all learners to share effectively and meaningfully in social life.

3   Designing for Ethical Thinking and Reasoning

3.1   Learning to Train Ethical Thinking

Addressing the design of adaptive instructional systems to support ethical thinking and reasoning, we argue, is a topic of consideration for developing an ethical framework,

falling under the umbrella of recommended practices. While there has been some work in determining the cognitive skills implicated in critical ethical thinking and reasoning, there is more work to be done as this effort relates to the adaptive instructional system domain. Arguably, ethics education and training should begin with an understanding of the relevant traits and cognitive skills implicated in ethical thinking and reasoning [17] —including moral imagination [18], problem representation and framing in decision making [19–21], interpretation, prioritization, bias identification, perspective taking, and emotional understanding [17].

An ongoing body of work seeks to unpack traits implicated in ethical thinking and behaviors [22, 23]. For example, there is evidence that personality traits—specifically low scores on the Honesty-Humility trait as measured by the HEXACO—are predictors of harmful and unethical behaviors [24] and lower learning outcomes in medical critical care education [23]. In terms of identifying relevant cognitive skills, there is evidence that creative thought and ethical thinking are closely associated, as both are characterized by uncertainty, and have multiple answers with multiple constraints [25]. In addition, there is evidence that working memory [26], cognitive interruptions [27], sense-making [25], and forecasting [28] play a role in ethical thinking—the latter two elements specifically implicated in developing mental models that allow individuals to discriminate critical causes and constraints in ethical dilemmas. However, what is missing is empirical evidence as to how adaptive instructional systems can be designed and deployed to support these relevant cognitive skills, determining if there are other skills latent in ethical decision making that are affected by mediation of adaptive instructional systems, and determining what and how individual traits can be used to inform adaptive instruction as it relates to supporting the development of ethical thinking and reasoning. While a daunting amount of work, we believe addressing these areas rises to the level of a social imperative. Not surprisingly, Dewey believed the same:

> A large part of the difference between those who are stagnant and reactionary and those who are genuinely progressive in social matters comes from the fact that the former think of morals as confined, boxed, within a round of duties and sphere of values which are fixed and final. Most of the serious moral problems of the present time are dependent for their solution upon a general realization that the contrary is the case Probably the great need of the present time is that the traditional barriers between scientific and moral knowledge be broken down so that there will be organized and consecutive endeavor to use all available scientific knowledge for humane and social ends [10].

There is also an opportunity to recommend to the adaptive instructional systems domain that designers, policy makers, and educators consider expanding their concerns from assessing only outcomes of learning, but consider how they are designing learning systems that contextualize outcomes within conditions that support the development of ethical citizens [29]. Goodlad [29] notes that when assessing the purpose of schools, there is a disconnect between teaching domain mastery of content areas and aligning these efforts to a broader purpose of education. He states:

> Most people have lofty goals for education. They talk about developing citizens, responsible workers, and good community members. But as your question implies, these ideals are very difficult to appraise, in part because we think we don't have a common set of values. The problem is that successful marks, grades, and test scores do not correlate with any of the virtues

that we set for the young. So we can measure fairly accurately whether a youngster is able to manipulate numbers, whether a youngster is able to read and write. But when it comes to civility, developing a test to be used in large quantities is a challenge. If we would move our attention away from thinking only of outcomes and think of conditions, then we could start examining whether the conditions are democratic, whether the conditions are caring, whether the conditions provide equity. I use a simple analogy: If you discover that in the population there's a great number of respiratory problems—colds, influenza—you might want to look at the conditions under which people are living. And if you provide for better conditions, you can't guarantee that people won't get sick. But you move a long way toward a healthier population.

Lastly, there is also an opportunity to recommend to the adaptive instructional systems domain that designers, policy makers, and educators consider expanding their concerns from assessing only outcomes of learning, but find ways to embed ethical considerations into instructional designs that would more explicitly link learning outcomes to real world conditions. This, we believe is a more fully realized Deweyan ethical framework that is desperately needed today.

3.2   Final Thoughts

Essentially, our effort to establish ethical framework standards that would provide some governance for adaptive instructional systems is not limited to the ethical design of these systems. Rather, it is our position that within these standards we provide recommendations to designers and educators to consider developing adaptive instructional systems that support the development of ethical thinking and reasoning, pursue fundamental research to unpack the relationship between ethical thinking and mediating effects of engaging with these systems, and consider expanding their preoccupation with simple learning outcomes to address broader ethical considerations of designing conditions that more explicitly link outcomes to promoting ethical agency.

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