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Ethical Concerns in Ai-Driven Assessments in the Educational Context: A Theoretical Analysis through Deontological and Utilitarian Perspectives

Deborah Angeline J[1], Saravanan M[2]

[1]PhD Research Scholar, School of Media Technology and Communication, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, India.
[2]Associate Professor, School of Media Technology and Communication, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, India.
Corresponding Email: drmsaravanan@veltech.edu.in

Abstract
The integration of Artificial Intelligence (AI) into educational assessment represents a paradigm shift in evaluating student learning. AI-driven tools—ranging from automated grading systems to adaptive testing platforms—offer unprecedented efficiency, objectivity, and scalability. However, these technological advances also raise pressing ethical dilemmas related to fairness, accountability, transparency, and data privacy. This study addresses these challenges by synthesizing two foundational ethical frameworks: deontological ethics and utilitarian ethics. Drawing on deontological ethics, which emphasize moral duty and responsible implementation, and utilitarian ethics, which assess actions based on their societal benefits and harms, this analysis develops a balanced conceptual framework for the ethical deployment of AI in education. By integrating Kant's duty-based philosophy with the consequentiality perspectives of Mill and Bentham, the study articulates conditions under which AI use in education can be considered ethically legitimate. Findings from a systematic literature review suggest that this legitimacy is contingent upon sustained human oversight, algorithmic transparency, moral accountability, and demonstrable equity in learning outcomes. The proposed framework offers practical guidance for policymakers, educators, and technology developers committed to promoting responsible AI innovation in education.

Keywords - AI-Driven Assessment, Deontological Ethics, Utilitarianism, Data privacy

1. Introduction
The rapid growth of Artificial Intelligence in education creates an irreplaceable transformation on how knowledge is delivered, evaluated and can be personalized. the automated assessment technologies which ranges from intelligent essay graders to AI based proctoring systems have promised to revolutionize education by providing efficiency, objectivity and scalability (Baran, 2022). In particular the Ai driven assessments have been widely known for reducing the human bias, providing a real time feedback and identifying the learning gaps through data driven sources and insights.
However, while the technology capabilities of Ai are advancing rapidly, the ethical reflection has not kept in pace. concerns surrounding the fairness, data privacy, accountability and the loss of human judgment has emerged as a global debate (Williamson & Beynon, 2020).

Research Questions
1. How can AI make fair judgements about human leaners? such as cognitive, cultural, and socio-economic differences?
2. Who should be held accountable when AI systems make erroneous judgments in educational contexts?

3. What are the ethical considerations of AI-based educational systems in shaping future generations' values and decision-making?
This paper argues that AI in assessment cannot be ethically neutral to everything. decisions embedded with AI systems can reflect moral, cultural and institutional choices. therefore, evaluating these technologies with ethical theory becomes crucial. The study focusses on Deontological ethics, which emphasizes the moral duties and universal principles and rules (kant,1785), along with Utilitarian ethics, which speaks about the outcomes based on collectives benefits and harms (Mill, 1863). By combining these two theories, the research provides a balanced theoretical framework for analyzing the ethical problems or dilemma where the automated assessment and offers insights the future educational system.

2. Literature Review:

2.1 AI IN EDUCATIONAL ASSESSMENT:

The AI techs have been introduced to a paradigm shift on how the educational assessments works (like how they conduct, analysis, and interpret.). the automated scoring systems, tutoring tools and the predictive learning analytics are being deployed across the institutions to enhance the performance measurements and instructional designs (Luckin & Holmes ,2017). Systems like these use the leverage machine learning to evaluate and interpret the complex students' inputs such as essays, discussions, and even some emotional engagement, providing rapid data driven insights (Eaton ,2023). Such automation is often justified by its potential in order to reduce the human and administrative biased burdens.

The scholars argue that automation can simply replace the teacher and instructors with algorithmic bias which maybe embedder within the data used to train the AI systems (Buolamwini & Gebru ,2018). Simultaneously the decisions made by AI evaluators may reinforce the existing inequalities instead of eliminating them. for instance, the natural language processing models which are trained predominantly on western linguistic norms or culture can misinterpret the non -native expressions which will result in as a disadvantage to the students from the diverse linguistic backgrounds (Florida &Cowls, 2022). based on this study we can state that the AI driven assessment may promise greater efficiency, it also exposes the education systems to a systematic ethical risk.

2.2 Ethical Challenges Identified In Prior Research:

The AI educational ethical analysis has evolved into more domain based specific considerations from general technologies. In early works of computer ethics which emphasized the principles of autonomy, non-maleficence and justice (Beauchamp & Childress, 2001), which got later adapted for digital learning environments. recent frameworks such as floridi's (2013) information ethics extends the moral agency to data systems who are asserting the information themselves and deserves an ethical consideration due to their impact on welfare of human.

As in educational context, AI ethical governance has become a major concern. UNESCO (2021) presses the importance of human centred AI systems which upload the educational values like equity, transparency and accountability. yet many institutional policies tend to remain inactive in addressing the issues of bias or privacy until harm occurs (Williamson & Piattoeva, 2022). this approach highlights the absence of comprehensive ethical reasoning which his integrated into the design.

Thus, by applying the deontological and utilitarian theories and their perspectives, this paper contributes to a greater and richer ethical understanding of how AI systems should perform in the educational settings.

2.3 Previous Studies On Ai Driven Assessment Ethics

The empirical and theoretical studies have drastically pointed out the ethical issues which connects to the algorithmic assessment systems. the earlier concerns which came from Lukin el at. (2016), who made an argument on automated grading systems can preserve the historical inequities of the data used to train the AI systems which might lack of cultural and contextual diversities. This issue can be stated under the data colonialism a critique proposed by Couldry and Mejia's (2019), who claimed that data extractions in the education mirrors the broader patterns of social exploitations, where a student information can be commodified for the institutional or corporate gain.

Holmes et al. (2022) also emphasized that using AI in education may enhances the administrative efficiency which also risks in the dehumanisation in understanding the metrics over holistic understandings. Likewise, Selwyn (2019) also warns that the technological solutionism in the educations often ignores the social ethical consequences in the pursuit of innovations and creativity. Automated grading such as ETS's e -rater or the Pearson's intellimetric may have been know for its inconsistent scoring and opacity which raise questions about the validity and moral reliability on AI based evaluations (Perelman, 2014).
While some researchers, including Williamson and Piattoeva (2022), who analysed the data driven governance redefines the educational accountability on shifting the trust from the teacher and instructors to algorithms. Theirs findings states that the AI's objectivity may or may not erode the institutional legitimacy where the stakeholders cannot tend to understand the automated decisions.

In addition to this the literature from the past decades' underscores that the automated learning evaluations is both transformative and ethically threatened. so, front the consensus is clear: the AI in education depends not fully on its accuracy or efficiency but also on its moral algorithm which may be human cantered educational values.

3. Theoretical Framework:

3.1 Deontological Ethics And Ai Assessment

The deontological ethics formulated by Immanuel Kant (1785), states that the moral actions might not be determined by the consequences but by the focus on duty, universal moral laws and respect for beings. so, in the context the deontological ethics demand the educational institutions to treat the students rightfully not by data points which is defined by some algorithmic systems on autonomous individuals which deserves the dignity and fairness.
Thus, this approach focusses on transparency, accountability and oversight of humans who might considered as a moral imperative, regardless of what might the outcomes be. for example, if an AI assessment tool gives results that are accurate and similar to the opaque algorithms. it would fail to meet the standards of deontological ethical study because the process of this study undermines the consent and respect for persons. As Kantian ethics also focus on the categorical imperative which acts according to the maxims where one would be willing to become the universal law (developers and the educators should ensure that the AI

systems are utilized in a way which could be justified in moral terms (Taddeo & Floridi, 2018).

Altogether the deontological reasoning and study recognizes the inherent risks of all moral delegation. when a machine makes evaluative corrections ore judgments they might lack intentionally and moral agency. thus, the human educators can retain to the ethical duty to oversee, validate and to interpret the AI outputs of the data. This results in the assurance that the moral burdens of assessments remain as a human centered which preserves trust and integrity in the educational and academic systems.

3.2 Utilitarian Ethics And Ai Assessment:

Adversely, the utilitarianism which was formulated by Jeremy Bentham (1789) and John Stuart Mill (1861) assess the actions by the outcomes mainly whether thy can be a maximized happiness or utility. From the utilitarian theory AI driven assessments can be justified if they the to yield into greater educational benefits. for example, in automated scoring one can enable faster feedback, scalable grading and even get a personalized instruction which all improves the overall learning efficiency (Bornstein et al. 2021).
Nevertheless, utilitarian also demands for a careful cost beneficial analysis. The benefits of ai – like efficiency and accessibility comes with an expense of privacy, psychological wellbeing, fairness then the whole utility diminishes. so, the utilitarian leans to encourage the policymakers to focus on a proportional balance between the benefits of automation and the ethical cost. On the educational basis, the utilitarian forces out the in ensuring the ai tools can be accessible to the diverse learners, including those diverse natives and underrepresented groups which might not have the direct access. this results in the equitable profits which connects to the moral requirements not only the policy preferences. Simultaneously the framework of the study acts as a guide to the institutions and academic centres to pursue the greatest good to a great number while also focusing on reducing the harm to minimal levels by safeguarding measures.

3.3 Integrating Deontological And Utilitarian Perspectives:
As the deontological and utilitarian ethics forms a distinct philosophical tradition which are duty based versus the consequence based one which deals with the convergence of the concern in justice, welfare of humans and the moral responsibility. this integrating focus to produce a comprehensive ethical model for evaluating the AI driven assessment which ensures both the moral authentic and the social benefits. this dual theory also synthesis for a balanced decision making: as the deontological ethics sets a moral boundary which cannot be crossed while the utilitarian ethics frames the optimization for the positive outcomes within those boundaries.
These frameworks can be divided into three main components

- **Individuals respects:** students should be treated as autonomous moral agents not a data subject.
- **Profitability:** The technology should be seen as an improvement for learning outcomes.
- **Justice:** The profits and problems of the AI should be distributed equitably among all the learners.

Thus, this synthesis of both perspectives creates a dynamic ethical model which not only is efficient but also morally grounds the problems. as the deontological focus on principles while utilitarian on outcomes.

4. Conceptual Frameworks:

The framework shows a clear view of the integration of the two theories (deontological and utilitarian ethics) which acts as a complementary dimension for analyzing the AI based evaluation concept in the education systems. this establishes the logical relationships among the three major constructs which is the ethical principles, AI mechanism and the educational outcomes.

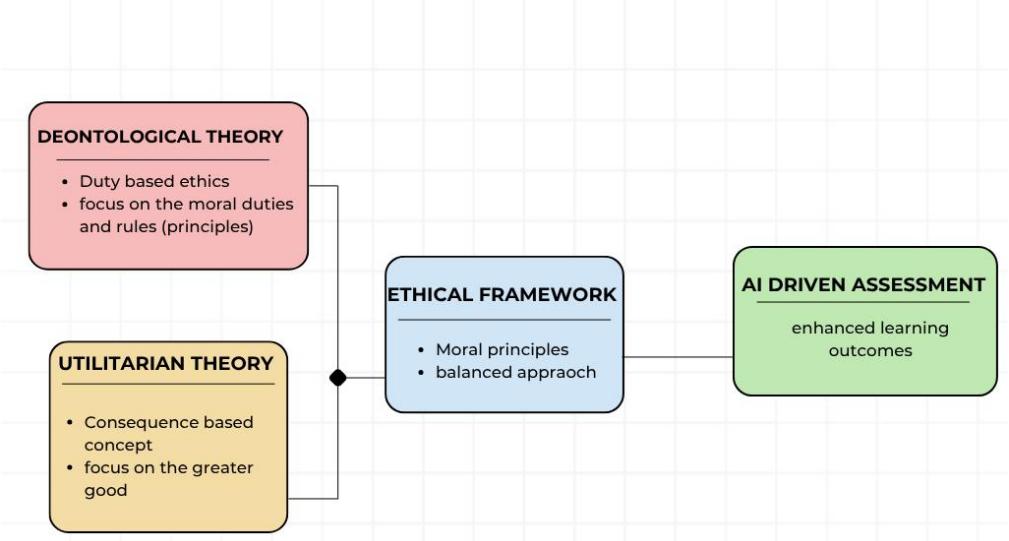

Figure.1 Conceptual Framework

4.1 Frame work overview:

In the given above figure, the two primary ethical theories -deontological ethics and the utilitarian ethics persuades to shape the moral evaluation of AI driven assessments practices.

As we know the deontological ethics anchors the system in principles of duty, fairness, accountability and respect for dignity of humans. likewise, the utilitarian ethics also evaluates the overall benefits, outcome equity and the impact of the educational systems.

Hence the dual ethical lens convers the influence of four critical domain of assessment ethics.

- Fairness and favoritism
- the Accountability and transparency
- Data privacy and surveillance
- Academic integrity and oversight of humans

Together, these domains interact with AI mechanisms, shaping the ethical flows that guide AI systems. This process leads to the development of ethical foundations and educational implications, ultimately aiming for the best possible outcomes.

4.2 THEORETICAL INTEGRATION and FLOW:

The conceptual framework functions on three interconnected levels.

Level 1: Ethical core

This is the base foundation of the framework which deals with the ethical reasoning for the technological department. the deontological ethics stresses the duties and non-negotiable moral boundaries as the utilitarian provides a free lens to see the balance of benefits and harms.

Level 2: Technological Mediation

In this AI systems functions as a mediator between the ethical principles and the educational algorithms. the machine learning algorithm interprets the human designed sets while the data process and the predictive analytics might translate the student's actions into a quantifiable metrics for the understanding of the machine. the ethical soundness of these processes depends on how morally or faithfully they portray the moral imperatives like fairness and consent.

Level 3: Educational Outcomes

The last outer layer of this framework denotes the practical effect on the educational ecosystem with improved efficiency, personalization. This level also shows how the ethical design may or may not directly correlates with the institutional trust and the student's wellbeing. Thus, by linking all these levels we can learn the framework provides a systematic view of ethical accountability which extends from the philosophical principles to classroom realities.

4.3 Frame Work Applications:

This conceptual framework serves both analytical and normative functions. Analytically, it provides a way for researchers and policymakers to evaluate the moral implications of AI systems. Normatively, it offers guiding principles for the responsible development and governance of AI assessment tools.

When designing an AI grading system, developers should first assess whether it is a decision-making system or not. If it is, they must ensure that the system respects individual autonomy and carefully evaluate the outcomes it generates, as these could have significant implications in educational contexts. Next, institutions adopting AI should ensure that ethical considerations are integrated through 'ethics-by-design' methodologies, aligning fairness algorithms with efforts to minimize bias in technical workflows.

5. Discussions:

The theoretical concept of deontological and the utilitarian ethics provides a drastic foundation for addressing the complex moral landscapes. well as for the discussions focus on how these ethical principles can be operationalized to revoke the tension between the innovation and integrity in educational places and norms.

5.1 BALANCING EFFICIENCY with ETHICAL RESPONSIBILITY:

The AI systems are often found to be lauded with efficiency, consistency and ability to process wide range of data at a scale. well however, when the efficacy becomes the dominant scale, the moral of learning such as empathy, individuality and the fairness has been overshadowed (Selwyn, 2019). Thus, in this combined ethical pear the framework proposed here cautions against the instrumental rationality, where the technology acts as an institutional convenience for the human errors and at their expense.

Deontological ethics ensures that the ethical principles acts as a constraint on with the efficiency while the utilitarian deals with the ethical boundaries which clearly don not paralyze or sop the innovations. So together these two theories promote what can we term as principled pragmatism -technological advancement of educational goals within the comprising moral integrity.

5.2 RESTORING HUMAN OVERSIGHT and MORAL AGENCY:

The mechanization of assessment can erode the educator's moral roles, shifting to the authorities to algorithm. this raises questions of moral displacement, where the machines make evaluative judgements traditionally which has been reserved for human reasoning so under the deontological ethics these displacements are ethically untenable as the machines lack moral will and accountability. and the utilitarianism, may permit automation if it can be demonstrated to be improved collective learning outcomes. the actual balance lies between the augmented intelligence and a Human -AI partnership where the technology supports rather than acts as supplants for human judgements.

5.3 SOCIO-EDUCATIONAL IMPLICATIONS

The evolution of ethics in AI extends beyond an individual's classrooms to a systematic educational governance. these institutions must recognize that the design of technologies are choices. the selections of data, algorithms and evaluations embeds the value systems which shapes the educational judgments and serve justice (Floridi &Cowls, 2022). Therefore, the ethics cannot remain a just add0on but it should /must be embedded into the layers of AI governance from a basic data policy to assessment designs. The framework proposed in this study gives a roadmap for such ethically aligned integration.

6. Recommendations:

Drawing from the dual ethical framework and the conceptual models, the following recommendations process to guide the developers, educators and the policy makers towards a responsible AI adoption in education systems.

6.1 BASED ON THE ALGORTHMS:

- The incorporate fairness and the favoritism detection with the help of the AI in the algorithmic systems.
- A fairly regular audit algorithm which helps us to identify and minimize the systematic bias and other crisis.
- This also ensures that a data with diversity can be maintained to promote the equitable assessments and their outcomes.

6.2 TRANSPARENCY AND ACCOUNTABILITY:

- This helps to develop explainable AI interfaces which allow the educators and the students to understand the AI systems and their decisions.
- To implement a transparent accountability and reporting mechanisms for ow the assessments are created and how they are used.
- To foster the accountability through the documentation and feed back medium for the AI systems and their based decisions.

6.3 DATA GOVERNANCE:

- This aims to establish the ethically driven data used protocols which emphasize the privacy and information.

- To limit the data collections for essential educational purposes only.
- We should ensure the compliance of the institutional and other legal data should be under the protection standards.

6.4 EDUCATIONAL TRAINING:

- To create an AI ethics-based learning programs for the educators and the instructors so they can teach the students with more efficiency.
- The teacher and the educators should be able to interpret the AI outputs critically and ethically.
- Thus, they can ensure the continuous learning on AI ethics should maintain the human oversight in the assessments process.

6.5 POLICY DEVELOPMENT:

- To mandate the ethical reviews boards for all educational institutions who are using AI systems.
- They should create a clear ethical guidelines and policies about the AI adoptions in their educational classes.
- To maintain a standardized ethical accountability procedure.

6.6 HUMAN OVERSIGHT:

- To maintain a clear human judgement in the hybrid AI human assessments.
- We should encourage the human intervention even in high end stake assessments instead of solely relaying on the AI systems.
- This preserves a peaceful balance between the automation and the empathy which creates a moral integrity in the educational institutions.

7.Conclusions:

The AI driven assessments makes one of the most profound transformations in the contemporary education, which offers both promise and peril. This paper demonstrates that the technological innovations can be decupled from the ethical reflections, risk undermining and the very major values which is fairness, integrity and respect for human dignity. By integrating the two theories we can offers a theoretical framework which unites the moral duties and social benefits, ensuring that AI can serves as education rather than dominating it.
The conceptual framework develops positions the ethics as a structural foundation for the responsibility of AI deployment. this underscores that fairness, accountability and transparency are not only the technical features but also the moral imperatives. When they are perfectly aligned, the deontological study ensures a respect for individuals, as the utilitarian evaluation ensures collective welfare – together creating a model for the ethical bridge in educational innovations.

For future research should extend this theoretical model into empirical validation -examining how these principles works in real world AI assessment systems across diverse cultural and native context. The ongoing dialogue between the ethics and technology must evolve towards a Human centered AI ethics, where the innovations remains strong a firm in moral responsibility. in addition to this, the ethical progress must pace the technological progress. as only through it there will be continuous reflections of accountability and human oversight which will drive the AI assessment to fulfill its promise of advancing not diminishing the human education.

8. References

1. Beauchamp, T. L., & Childress, J. F. (2001). *Principles of biomedical ethics* (5th ed.). Oxford University Press.

2. Bornstein, J., Herbert, J. R., & Miller, K. W. (2021). The ethics of algorithmic decision-making. *AI and Ethics, 1*(2), 111–124.
3. Buolamwini, J., & Gebru, T. (2018). Gender shades: Intersectional accuracy disparities in commercial gender classification. *Proceedings of Machine Learning Research, 81*, 1–15.
4. Couldry, N., & Mejias, U. (2019). *The costs of connection: How data is colonizing human life and appropriating it for capitalism.* Stanford University Press.
5. Eaton, S. E. (2023). Artificial intelligence and academic integrity: Examining the paradox of automation in education. *Journal of Academic Ethics, 21*(3), 347–365.
6. Floridi, L., & Cowls, J. (2022). A unified framework of five principles for AI in society. *Harvard Data Science Review, 2*(1), 1–17.
7. Holmes, W., Bialik, M., & Fadel, C. (2022). *Artificial intelligence in education: Promises and implications for teaching and learning.* Center for Curriculum Redesign.
8. Kant, I. (1785). *Groundwork of the metaphysics of morals.* Harper & Row. Luckin, R., & Holmes, W. (2017). Intelligence unleashed: An argument for AI in education. *Pearson Education Research Report.*
9. Perelman, L. (2014). When "the state of the art" is counting words. *Teachers College Record, 116*(12), 1–17.
10. Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education.* Polity Press.
11. Taddeo, M., & Floridi, L. (2018). How AI can be a force for good. *Science, 361*(6404), 751–752.
12. Williamson, B., & Eynon, R. (2020). Historical threads, missing strands, and patterns of complexity: The emergence of AI in education (AIEd). *Learning, Media and Technology, 45*(3), 223–235.
13. Williamson, B., & Piattoeva, N. (2022). Objectivity as standardization in data-driven education governance: Grasping the global through the local. *Critical Studies in Education, 63*(1), 1–17.