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CHAPTER IX

Understanding Artificial Intelligence: A Catholic Guide to Moral Education in the Age of AI

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Abstract

The rise of artificial intelligence technology presents substantial ethical dilemmas, especially regarding its influence on the moral upbringing of young individuals. This article explores how Catholic principles can serve as a compass in navigating this moral quandary. The importance of this review lies in providing practical guidance to educators and technology developers in incorporating Catholic values into AI systems, thus ensuring that technology not only possesses intellectual acumen but also embodies a solid moral framework. Using a literature review approach, this article offers a novel contribution by consolidating and synthesizing existing literature to assist practitioners in designing and implementing AI systems rooted in Catholic principles in moral education. We hope this article will constructively steer the trajectory of artificial intelligence development toward moral education, by Catholic teachings, and ultimately foster positive character development in children and youth.

Keywords: Artificial Intelligence, Catholic Guide, Moral Education

Introduction

Rapid advances in artificial intelligence (AI) and machine learning bring many advantages to the field of education but simultaneously raise profound questions and concerns regarding the ethical and theological implications of their implementation. The Catholic Church is founded on an unshakable faith in the Triune God. It has played a pivotal role in shaping Western civilization through its contributions to philosophy, science, art, and literature. The head of the Catholic Church, Pope Francis (2018), said that using artificial intelligence, robots, and other technical advancements should prioritize their contribution to serving humanity and safeguarding our shared environment rather than potentially leading to adverse outcomes, as some evaluations unhappily predict. In recognition of this, Pope Francis (2019) has disseminated to participants in the plenary assembly of the

Pontifical Academy for Life that the inherent dignity of every human being must be unequivocally prioritized in our contemplation and conduct.

In education, integrating artificial intelligence (AI) impacts various dimensions. These dimensions include the automation of administrative functions, the assessment of students, and the incorporation of AI into the learning process. This incorporation can potentially enhance student engagement and academic performance, as suggested by (Luckin et al., 2016). While it is crucial to acknowledge the positive advantages brought by these advancements, they also give rise to ethical dilemmas that necessitate attention. These dilemmas primarily pertain to moral accountability and the transformative influence of AI on educational structures, as emphasized by (Magaña, 2020). The Catholic Church can significantly contribute by offering ethical and spiritual guidance within this context. This contribution ensures these technologies are developed and utilized to improve society and preserve universal human values.

The Catholic Church's ethical guidelines stem from the theological conviction that human beings, created in the likeness and image of God according to Genesis 1:26-27, have an inherent dignity that is not diminished by technological advances. Archbishop Vincenzo Paglia (2020), Chairman of the Pontifical Academy for Life, emphasized that artificial intelligence (AI) should not undermine the personal aspect of each learner's humanity, as God uniquely forms them. Likewise, Philip Boo (2018), a theologian and philosopher, highlighted that while computing and data can enhance human cognitive abilities, they are incapable of replacing aspects of the human soul, such as emotions, spirituality, and the ability to distinguish between right and wrong. These principles are an integral part of Catholic ethical and philosophical heritage, including teachings on human rights, which guide our engagement with AI in education.

By utilizing the Catholic theological understanding of the essence of human nature, it becomes reasonable to build a practical framework for applying artificial intelligence (AI) in education. First, in data utilization, it is imperative to prioritize protecting students' privacy and confidentiality while simultaneously recognizing and respecting their inherent dignity (2020). Examples of privacy violations, as exemplified by the unauthorized sale and misuse of user data by Facebook and Cambridge Analytica (Isaak & Hanna, 2018), serve as an indication that the unregulated commercialization of data has the potential to devalue human dignity, consequently reducing individuals to mere commodities.

Second, AI systems must be carefully designed to minimize algorithmic bias, thereby reducing the perpetuation of stereotypes based on gender, race, or other personal attributes (Favaretto et al., 2019). Third, educators must undergo adequate training to supervise and guide AI interactions with students effectively, ensuring that these interactions are aligned with the cultivation of positive character traits and values (Bryson, 2019). Finally, despite AI's recognized efficiency and effectiveness, teachers' evaluation and assessment of students cannot be replaced, as interpersonal relationships are an indispensable component of the AI experience.

Guided by the fundamental principles of Catholic theology and philosophy, there is an optimistic aspiration that technological advances, such as artificial intelligence, can be used for good purposes. This involves enhancing and preserving human dignity while simultaneously contributing to the overarching goal of education. Education in this context encompasses not solely the conveyance of information but also the instillation of virtuous characteristics congruent with esteemed principles, such as veracity, compassion, and fairness. It is of utmost importance to acknowledge that the exclusion of ethical deliberations in the development of technology will invariably result in disturbance within society. Nevertheless, through appropriate ethical direction, the advancement of technology has the potential to elevate human values to unparalleled levels.

Catholic moral and ethical teachings provide a solid framework for directing these technological advancements, recognizing the human values derived from the Catholic faith. Furthermore, Catholic moral principles demonstrate the Church's unwavering dedication to upholding justice, compassion, and human dignity. Understanding these principles is increasingly important in shaping our interactions with increasingly sophisticated technologies. Moreover, the ethical quandaries in applying artificial intelligence in education require thorough contemplation and thoughtful ethical consideration. This ensures that these innovations are aligned with Catholic moral principles and do not undermine the values of moral education.

In investigating the impact of artificial intelligence on the moral ethics of children and young people in education, it is of utmost importance to grasp how these technological advancements mold the mindset, values, and ethical guidance of future generations. Moreover, the preservation of moral principles deeply rooted in Catholic teachings holds great significance in ensuring the effectiveness of these technological advancements in augmenting the quality of education and fostering character development. By comprehensively addressing all five subtopics, this

paper aims to provide profound insights and practical guidelines for individuals engaged in the field of education during this period characterized by artificial intelligence.

This article, titled Understanding Artificial Intelligence: A Catholic Manual for Moral Education in the Age of AI, seeks to explore and direct discourse around how Catholic theological foundations can inform the evolution and implementation of artificial intelligence in the educational domain. Skillfully guiding the reader through the areas of theological foundations, moral principles, ethical difficulties, effects on the ethical landscape of education for children and youth, and moral responsibility, the manuscript seeks to illustrate the perspectives and guidelines embraced by Catholic teaching in the face of an ever-changing era of technological advancement.

Literature Review

Catholic Theological Foundations in the Development of Artificial Intelligence

Catholic theological foundations in the advancement of artificial intelligence demonstrate a deep understanding of how the Catholic faith views humanity as stewards on earth and their responsibility for God's creation. The invaluable contributions of Catholic scholars and theologians have played an essential role in shaping this perspective and establishing the theological foundations underlying ethical approaches to artificial intelligence (Francis, 2015; Herzfeld, 2002).

Pope Francis (2015), through his encyclical Laudato Si: On Care for Our Common Home, has significantly contributed to establishing a theological basis for approaches to artificial intelligence. In this encyclical, Pope Francis emphasized the concept of integral ecology, where humanity is considered, a steward entrusted with the sustainability and harmony of creation. This concept sets the stage for ethical and moral considerations in artificial intelligence.

Catholic Moral Principles on the Use of Artificial Intelligence

The ethical considerations surrounding artificial intelligence have garnered significant attention from the Catholic Church. The Catholic moral framework about the utilization of AI can offer valuable guidance for the conscientious and ethical advancement and application of this technology. In his 57th World Day of

Peace address, Pope Francis (2024) underscored the significance of employing AI to foster the common good and safeguard human dignity.

The Pope emphasized the imperative nature of utilizing AI to enhance human life rather than exploiting it. Furthermore, the Pope advocated implementing an AI ethics code rooted in Catholic moral principles. These moral principles encompass the following: (1) Human dignity: Everyone possesses equal dignity, irrespective of their background. AI should be employed to uphold the dignity of all individuals, particularly the most vulnerable among us. (2) Solidarity: We bear a collective responsibility towards one another. AI should be utilized to foster solidarity and social justice. (3) Justice: Everyone is entitled to benefit from AI. Accordingly, AI should be employed to mitigate inequality and disparities. (4) Freedom: Everyone has the right to freedom and autonomy. AI should be harnessed to safeguard human freedom and autonomy.

These moral principles are also affirmed in the Rome Call for AI Ethics, issued by the Pontifical Academy for Life (2023). The Rome Call calls for developing an AI ethics framework based on Catholic moral values. This framework ought to incorporate the subsequent principles: (1) Transparency: in essence, AI systems should be capable of being elucidated; (2) Inclusion: the necessities of all human beings need to be taken into account so that every individual can reap benefits and all individuals can be provided with the most optimal circumstances to express themselves and advance; (3) Responsibility: those who construct and deploy the utilization of AI must proceed with responsibility and transparency; (4) Impartiality: refrain from generating or acting based on prejudice, thereby preserving equity and human dignity; (5) Reliability: AI systems must possess the ability to function dependably; (6) Security and privacy: AI systems must operate securely and uphold the privacy of users.

Analysis of Gaps and Gaps in the Literature Related to AI and Catholic Moral Education

Academic investigations surrounding the moral principles of synthetic intelligence (AI) and its implications in character cultivation have experienced significant growth in recent years (Lindh & Nolin, 2016). However, upon closer inspection, it becomes clear that the current discourse lacks a comprehensive exploration of the Catholic theological-philosophical perspective as an ethical framework; instead, it often focuses on secular perspectives or non-Catholic Christian denominations.

Verstraeten (2020), a theologian specializing in Catholic moral philosophy, currently lags behind other schools of AI ethics in formulating appropriate and relevant theological responses to these contemporary concerns despite the wealth of ethical contemplation of the Catholic Church. Verstraeten's analysis reveals that the emerging Catholic literature concentrates on the metaphysical aspects covering the ontological status of AI while neglecting the realm of praxis associated with educational ethics. From his perspective, Catholic theology must engage in deep dialogue with cutting-edge AI research findings to prevent the danger of being left behind, thus requiring a paradigmatic leap (Verstraeten, 2020).

According to William Frei (2021), a Catholic educational theologian, current literature and research on integrating AI-based technologies with Catholic curricula in schools and churches lacks constructive and ethically appropriate approaches. While general research on AI in education has flourished, there is a dearth of empirical studies and implementation plans that specifically address the moral perspective and values of the Catholic Church. For example, there is a dearth of exploration on how AI can encourage positive character development among Catholic students or provide practical guidance to teachers and catechists for integrating AI into religious curricula.

Consequently, Frei (2021) argues that there is a significant research gap in this domain, encompassing theoretical investigations grounded in Catholic theological and philosophical principles, as well as empirical research and case studies on implementing AI in Catholic educational and pastoral institutions. He identifies several research questions worthy of exploration, including: 1) How do principles such as human dignity or the right to privacy, as outlined in Catholic moral theology, inform the development of AI ethics and governance? 2) What challenges and opportunities might arise from adopting AI for religious and pastoral education? 3) What ethical and policy frameworks are needed to implement AI by Catholic values such as justice?

Therefore, the aforementioned literary examinations conducted by scholars in Catholic theology and education suggest that academic discussions and regulations regarding artificial intelligence and moral education offer a limited representation of a distinctively Catholic theological and philosophical point of view. Indeed, the Church's intellectual and ethical heritage has significant potential to contribute to an interdisciplinary dialogue that aims to shape the future of education by the inherent value of humanity. Consequently, future investigations need to address this shortcoming by specifically formulating ethical principles and

guidelines for applying artificial intelligence in education derived from fundamental principles of Catholic theology and moral philosophy.

Discussion

Ethical Challenges in Artificial Intelligence-Based Moral Education

The utilization of artificial intelligence in moral education presents a myriad of complex ethical quandaries. The interaction between moral values and increasingly sophisticated technological capabilities must be considered appropriately to uphold ethical principles in character building. Many experts and thinkers in technology ethics have identified essential issues related to this problem.

Shannon Vallor (2016), a theologian and technology ethicist, underscores the challenges of integrating artificial intelligence into moral education in the publication Technology and the Virtues. Vallor emphasizes the urgent need to ensure that the technologies used reflect and reinforce positive moral values. He argues that the understanding and utilization of technology should contribute to the cultivation of moral excellence rather than hinder it. Wendell Wallach (2009), a thinker in the field of technology ethics, delves into comparable difficulties in his work Moral Machines.

Wallach addresses how artificial intelligence systems should be tailored to align with moral and ethical standards. He concludes that we must guarantee that algorithms and AI used in moral education reflect ethical values and provide them. Several other experts, including Vallor and Wallach, also refer to the same issue. In his essay Minding Our Language, Neil Selwyn (2019), a professor of education and technology, emphasizes the need for educators to remain vigilant to prevent detrimental impacts on students' moral development from using digital technologies. Selwyn reminds us of the potential threats posed by unregulated interactions between technology and moral education processes.

Similarly, Margaret A. Boden (1987) warns against biases and value distortions that may arise when artificial intelligence systems replicate human behavior patterns, as discussed in her work Artificial Intelligence and Natural Humans. She argues that consistent monitoring and evaluation are essential to mitigate or avoid such problems. Another related concern was raised by Keenan

(2000), a Jesuit monk and conductor of biomedical ethics, in his paper Programs, Models, and Teachers. Keenan alluded to potential data privacy and information security issues for students when incorporating artificial intelligence into education. Protecting students' personal data and sensitive information is crucial to prevent unauthorized use or leakage.

Considering the perspectives presented above, it becomes clear that the application of artificial intelligence in moral education presents complex ethical dilemmas. Nevertheless, technological advancement is inevitable. Therefore, maximum efforts should be made to ensure that the utilization of artificial intelligence is aligned with positive moral values through consistent monitoring and evaluation, thus enabling effective control of potential adverse risks.

The Impact of Artificial Intelligence on the Ethics of Children and Youth Education

The ethical implications of integrating artificial intelligence (AI) into the education of children and adolescents present diverse issues. Scholars, including Golinkoff and Hirsh-Pasek (2016), Finn (2021), Winthrop (2022), and Woodcock (2021), have identified many important aspects regarding the incorporation of AI in the educational framework for this particular age group, who are undergoing character development and moral value formation.

Golinkoff and Hirsh-Pasek (2016), experts in child development psychology, underline the importance of recognizing children's need for social interaction and human connection in learning. They assert that while AI can offer assistance, human engagement must remain central to children's education (2016). Finn (2021), director of the Center for Science and Imagination at Arizona State University, explores the potential risks associated with algorithms in determining curriculum and assessing student performance. In his perspective, algorithms have the potential to perpetuate existing biases or even generate new ones, thus jeopardizing equity and fairness in education.

From the standpoint of preparing individuals for the workforce in the AI era, Woodcock (2021), a media theorist, draws attention to the ethical issues surrounding preparing children and young people for an increasingly automated world. Education, he maintains, must produce individuals equipped with the necessary skills to thrive in the age of artificial intelligence (2021). Winthrop (2022), director of the Center for Universal Education at the Brookings Institution, underscores the importance of stakeholder engagement in AI development and

implementation. According to him, the involvement of children, parents, and educators in the planning and implementation of artificial intelligence is crucial to ensure a positive impact that aligns with ethical values (2022).

Regarding data privacy issues, Crawford (2022), a leading senior researcher at Microsoft Research, issued a cautionary statement regarding the potential dangers of accumulating data about children. In the course of her scientific discourse, she asserted that the extensive collection of data on children can engender prejudice and perpetuate social stigma (Crawford, 2022). As a result, it becomes necessary to comprehensively examine various aspects, including psychological, ethical, vocational readiness, privacy, and participatory considerations, to fully understand the ramifications of artificial intelligence on the educational experiences of minors and adolescents. This effort is crucial in ensuring that the utilization of this technology produces constructive outcomes for the development of future generations.

Moral Accountability in Artificial Intelligence

Moral accountability is a focal point in advancing and implementing artificial intelligence (AI), which has garnered significant attention from experts in various scientific fields (Wallach & Allen, 2009). Throughout their discourse, these experts have identified many ethical hurdles and moral principles that must be faced in planning, training, and utilizing AI systems.

Shannon Vallor is one of the experts who underlines the importance of moral accountability in AI. In a publication titled Technology and the Virtues: A Philosophical Guide to a Future Worth Wanting, Vallor (2016) highlights that ensuring that developers and users are accountable for the ethical impact of the algorithms they create or use is the biggest challenge for the ethics of artificial intelligence. Wendell Wallach and Colin Allen also echo this idea in their work Moral Machines: Teaching Robots Right from Wrong (2009), which illuminates the complexity of defining moral standards for AI systems. According to Wallach (2009), incorporating human values and ethics into AI systems is an important aspect of answering the question of moral accountability.

Ryan Calo, a law professor at the University of Washington, has examined the application of moral accountability in the context of AI from a legal and ethical standpoint. In his article Robotics and the Lessons of Cyberlaw (2015), Calo argues that law and ethics must advance together to address the moral implications of advanced technologies such as AI. In contrast, Pope Francis, in his encyclical

Fratelli Tutti (2020), delivered a moral and ethical message relating to the use of technology, including AI. He emphasized that technology must conform to moral and ethical principles to ensure technological innovation and progress do not jeopardize human dignity and social justice.

Furthermore, Kate Crawford, a senior researcher at Microsoft Research, emphasizes the need to insist on moral responsibility to be present at every stage of AI system development and implementation. As a keynote speaker at the Conference on Neural Information Processing (2017), Crawford highlights the need to ensure moral accountability throughout the lifecycle of AI technologies, from the initial design phase to model training and implementation. In conclusion, the issue of moral accountability in AI is a multifaceted problem that requires a comprehensive approach. The perspectives of Vallor, Wallach, Calo, Pope Francis, and Crawford collectively paint a broad picture of the urgency in systematically incorporating moral responsibility into all aspects of AI development and application, thus safeguarding fundamental human values. The discourse covers various aspects such as human values, legal considerations, transparency, and collective accountability, which serve as the ethical foundation that drives the AI revolution.

Conclusion

This article sought to investigate the ethical and spiritual guidance provided by the Catholic Church in the realm of artificial intelligence (AI) applied to character education. By conducting an extensive literature review, this article found that while there is literature on AI ethics in general, there is a dearth of specific studies from a Catholic theological and philosophical perspective. Therefore, this article aims to contribute significantly by presenting distinctively Catholic ethical and spiritual guidelines, thus ensuring that AI innovations can produce positive outcomes while upholding the principles of humanity and social justice. These valuable insights are expected to assist stakeholders in Catholic education in the sensible application of AI for the greater good.

Several implications arise regarding the development of AI ethics, especially from the perspective of Catholic theology and moral philosophy. First, this article enriches the interdisciplinary academic discourse on AI ethics and governance by incorporating a Catholic theological viewpoint that has not been adequately explored. Second, formulating an ethical guideline framework based on Catholic principles can serve as a conceptual reference point for future research related to

this subject matter. Third, identifying research gaps and shortcomings in this article may encourage scholars to examine more specific educational ethics and AI issues. Finally, this article's findings regarding the urgent need for holistic moral accountability in AI technologies suggest that the study of ethics and law must advance harmoniously to protect human values.

The article also offers a large number of beneficial practical recommendations for stakeholders in the field of education and technology. Administrators of Catholic schools and educational institutions can use the ethical principles depicted as a guiding framework for the integration and judicious application of artificial intelligence. This could be particularly beneficial in addressing issues related to student data privacy or potential biases inherent in algorithms. Additionally, ecclesiastical authorities and dioceses can utilize these ethical guidelines and uphold moral responsibility in formulating policies and curricula that utilize artificial intelligence to enhance congregations' pastoral and catechetical experiences. Finally, education and AI technology developers must incorporate ethical principles rooted in a Catholic perspective at every stage of their research and development process to ensure alignment with fundamental human values.

In addition, governments and regulatory bodies can also consider the recommendations presented in this article as valuable input when formulating regulations and ethical standards governing the utilization of artificial intelligence. These regulations and standards need to consider the diverse moral dimensions and societal beliefs associated with AI. Therefore, while this article is primarily theoretical, it offers tangible and ethical guidance that can be effectively applied in practice and educational policy regarding the use of AI. This will ensure consistency with universal human values.

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