

UNVEILING POWER DYNAMICS IN AI-ENABLED EDUCATION: A FOUCAULDIAN PERSPECTIVE*

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Abstract

This paper explores the complex interplay between artificial intelligence (AI) and education through Michel Foucault's governmentality theory. It investigates how AI affects power dynamics, knowledge dissemination, surveillance, and individual agency in educational contexts. By applying Foucault's concepts of biopower, disciplinary power, and control, the paper uncovers the intricacies of AI in learning environments. It stresses the importance of ethical governance, critical reflection, and responsible decision-making in utilising AI for education. The analysis highlights the need to understand AI's influence on knowledge formation, educational hierarchies, and student experiences. It examines surveillance in AI-powered education, revealing control and regulation nuances. The paper emphasises addressing power imbalances, ensuring privacy, and promoting transparency in AI-driven education. It contributes to discussions on technology's ethical and practical implications in education, calling for strategies that prioritise student well-being, equity, and empowerment as technology evolves.

Key words: *Artificial intelligence in education, Power Dynamics, Educational Surveillance technology, Michel Foucault's governmentality.*

1. Introduction and Background

The integration of artificial intelligence (AI) in educational settings has sparked significant debate in recent years, primarily surrounding its influence on power dynamics and the distribution of knowledge. The theory of governmentality proposed by Michel Foucault offers a critical perspective for examining the functioning of power in societies, particularly about the governance of individuals and populations by institutions such as the Organisation for Economic Co-operation and Development (OECD) (Foucault, 2000). The theories proposed by Foucault offer a persuasive framework for understanding the reciprocal influence between AI and power dynamics in education (Genel & Carson, 2023). Foucault's criticisms of institutions and their regulatory procedures can apply to deploying AI algorithms

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and systems in diverse fields, including healthcare, criminal justice, and education (May, 2021). The author's focus on the historical and cultural factors that influence knowledge may also stimulate critical examination of AI technologies' biases, inequalities, and ethical challenges (Lindgren, 2023).

Michel Foucault's governmentality theory provides a critical lens through which to analyse societal power dynamics, particularly in AI-enabled education. This paper explores Foucault's concept of governmentality and its implications for unveiling power dynamics in AI-enabled education, focusing on how institutions govern behaviour and shape knowledge production. This study additionally explores Foucault's concepts of surveillance and control, knowledge and power, discourse and truth, and reflections on biopower and technologies of the self in the context of AI technologies such as drones, 3D printing, blockchain multimedia integration, and virtual reality studios.

This paper proposal examines Foucault's analysis of power and knowledge in the context of AI in education, elucidating the complex relationship between technological progress and societal regulation (Bhattarai, 2020). There is a lot of certification fraud and non-verification in higher education institutions; applying Foucault's theories to blockchain technology in the context of graduation certification reveals how this technology can decentralise and democratise the processes of discipline, power, and knowledge in higher education (De Filippi & Wright, 2018). It highlights a shift from traditional, centralised models of control and verification to more distributed and transparent systems, reshaping the dynamics of power and knowledge in the academic world (Manfren *et al.*, 2011).

Foucault's concepts of discipline, power, and knowledge to the analysis of 4IR Catalic niche areas such as virtual reality and multimedia integration in LMS, automated grading integration in LMS, and proctoring integration for continuous assessment, researchers and educators can critically examine the dynamics of online learning environments as well as the implications of these technologies for teaching and learning practices (Foucault, 2020c). This approach highlights how technology, automated grading systems, blockchain technology, and proctoring technologies mediate educational practices and the implications for students' experiences and the distribution of knowledge. Foucault's concept of the Panopticon to drone technology in farming reveals how surveillance can lead to more efficient and controlled agricultural practices (Sheridan, 2016). It highlights the power dynamics in gathering and using data, the potential for self-regulation in farming practices, and the ethical considerations of pervasive monitoring. This analysis underscores the broader implications of integrating advanced surveillance technologies into traditional practices, reshaping the landscape of power, control, and efficiency in agriculture (Licardo *et al.*, 2024). This paper analyses the intersection of artificial intelligence and education through Foucault's theories of power and governance, revealing how AI shapes knowledge, surveillance, and agency in learning environments. It emphasises the need for ethical oversight and equitable practices in AI-driven education to address power imbalances, protect privacy, consider sustainability and

the environment and enhance student empowerment. The next phase discusses governmentality.

2. Foucault's Governmentality

Analysing how power functions in contemporary societies, Foucault developed the notion of governmentality, which pertains to the logical, methodical, and strategic aspects of governance (Collier, 2009). In addition to formal institutions of governance, it also includes how individuals and populations are governed through different practices and discourses (Enroth, 2014). A fundamental element of Foucault's concept of governmentality is the notion of biopower, which pertains to the methods by which governments and institutions govern the lives and physical structures of populations (Oksala, 2013). The concept of biopower in AI-enabled education refers to using technology by educational systems to observe, regulate, and mould the learning experiences of students (Kikerpill & Siibak, 2023). Another fundamental notion is disciplinary power, defined by Foucault as the techniques of instruction, monitoring, and standardisation used by institutions to generate submissive and obedient individuals (Abdulzahra *et al.*, 2021). Within AI-enabled education, the algorithms, data analytics, and surveillance mechanisms employed to monitor student performance and behaviour demonstrate disciplinary authority (Pedro *et al.*, 2019).

The application of Foucault's concept of governmentality to AI-enabled education reveals significant power imbalances, highlighting the profound consequences of such technologies on educational structures and personal autonomy. Educational content, delivery methods, and assessment criteria are the subjects of influence by institutions, policymakers, and technology developers, which in turn impact students' learning experiences and outcomes (Brown *et al.*, 2024). Governmentality elucidates the role of AI technologies in generating and distributing knowledge in education (De Wet, 2022). Algorithms, machine learning models, and data analytics platforms provide educational material and shape and strengthen knowledge systems, beliefs, and behaviour patterns (Hasa, 2023).

The advent of AI-enabled education brings forth novel methods of monitoring and manipulation, so prompting enquiries into the boundaries of privacy, autonomy, and agency. Artificial intelligence (AI) systems used to track student progress, behaviour, and involvement can impact individual liberties and educational fairness (Pea Biernacki *et al.*, 2023). Foucauldian analysis promotes the practice of critical contemplation and opposition to prevailing power dynamics in AI-enabled instructional systems. Educators, students, and activists can confront and oppose oppressive practices, advocate for transparency and accountability in AI systems, and advance alternative teaching methods prioritising ethical concerns and social justice (Madaio *et al.*, 2022).

3. Foucault's Surveillance and Control

Foucault's concept of the Panopticon provides a lens through which to examine surveillance and control operations in educational environments driven by

artificial intelligence. The virtual reality (VR) environments, often employed for immersive educational experiences, resemble panoptic structures in which students and instructors are subject to constant surveillance (Hope, 2022). Surveillance regulates conduct and shapes the dissemination of information, modifying the boundaries of permissible conduct in didactic settings (Shala, 2021). Foucault's notion of the Panopticon, a facility layout that enables all prisoners to be monitored by a solitary guard without the prisoners being aware of being watched, serves as a helpful analogy for drone surveillance (Foucault, 2020b). In the context of an open and distance e-learning (ODEL) university, proctoring solutions are implemented to supervise student assessments post-COVID-19 to support ongoing evaluation and maintain integrity. However, it introduces specific challenges (Gamage *et al.*, 2020).

One further facet of surveillance and control involves advancing drone concepts, which aim to deploy drones for surveillance and intervention in hazardous areas where humans may be exposed to a specific level of radiation (Marin & Krajčiková, 2016). Uncrewed aerial vehicles, such as drones, can oversee student activities and campus security, expanding surveillance beyond confined areas (Lykou *et al.*, 2020). Foucault's examination of surveillance systems emphasises the role of these technologies in consolidating disciplinary power dynamics and overseeing and standardising behaviours in educational settings (Manolev *et al.*, 2020). With the advancement of drone technology and innovation, new applications have been developed, such as safety, facility monitoring, data gathering for delivery, and many others (Mohamed *et al.*, 2020). Numerous other AI-driven cutting-edge products are crucial in this context, yet factors like personal privacy, physical environment, students' financial and social status, and psychological background significantly influence students' conduct (Mohamed *et al.*, 2020). Regulatory bodies from both governmental and educational sectors mandate the implementation of leadership thinking processes to reduce student anxiety (Duffy, 2009).

In order to mitigate uncertainty and promote the integration of artificial intelligence (AI) to improve the social status of the community and embed practical applications into the theoretical framework of AI, it is necessary to have scholarly and community involvement (Yu, 2024). LMS functions as a secure learning environment that is readily comprehensible to students. Artificial intelligence integration into the Learning Management System (LMS) is unavoidable (Pedro *et al.*, 2019). Integration of virtual reality (VR) learning experiences into Learning Management Systems (LMS) creates immersive and interactive environments that influence students' perceptions and experiences (Jaruševičius *et al.*, 2024). Virtual reality (VR) experiences are not impartial; they are created by discourses shaping knowledge's presentation and comprehension (Kim *et al.*, 2024). Multimedia video offers surveillance capabilities that may benefit universities by using proctoring, virtual reality, multimedia integration in learning management systems (LMS), automated graded systems, machine learning, drone technologies, blockchain, and other technologies (Chaka, 2020). In addition to providing immersive learning experiences, virtual reality studios also include the monitoring and analysis of user interactions.

Foucault's scholarly observations on surveillance emphasize the necessity of ethical deliberations and protective measures to uphold the autonomy and rights of individuals in AI-enabled education (Baguinho, 2022). The significance of the blockchain verification component lies in its provision of authentication, credibility, and verification detection. While biometric AI products inherently incorporate this concept, they also give rise to apprehensions regarding data privacy and surveillance (Saleh *et al.*, 2020). Integrating artificial intelligence (AI) technologies such as drones, 3D printing, blockchain, and virtual reality studios in education brings forth novel methods of surveillance and control (Hernandez-de-Menendez *et al.*, 2020).

4. Foucault's Knowledge and Power

The correlation between power and knowledge is an indispensable aspect of Foucault's analyses. This paper analyses the fundamental ideologies that influence Foucault's power dynamics on artificial intelligence in higher education. The text emphasises the need for ongoing critical reflections on these technologies, analysing the ideologies that drive their implementation and contemplating their possible consequences for worldwide education. Foucault contends that contemporary societies possess a distinct type of authority called 'governmental power'. This concept includes various nationalities, methods, and behavioural patterns that control individuals, typically through self-regulatory processes (Foucault, 2000).

Applying artificial intelligence technologies in education revolutionizes the processes of generating and sharing knowledge. The utilisation of 3D printing enables interactive educational experiences and efficient creation of prototypes, so influencing the manifestation and dissemination of knowledge (Andić *et al.*, 2023). Incorporating blockchain technology enables the decentralization of learning platforms and the verification of credentials, thus influencing the credibility and availability of educational curricula (Any *et al.*, 2024). Pedagogical approaches and learning outcomes are influenced by virtual reality studios' novel knowledge acquisition and simulation modes (Kabanda *et al.*, 2022).

Foucault's examination of knowledge and power dynamics stimulates critical meditation on the role of AI technologies in facilitating educational practices and influencing epistemological frameworks. A comprehensive grasp of these dynamics is crucial to tackle power imbalances and guarantee fair and equal access to knowledge in AI-enabled education (Kayyali, 2024). Brown (2015) argues that power is not only imposed from above but is exercised through a complex system of social connections and discourses promoting adherence to specific norms and values. Governmentality implies that individuals are subject to external governance by institutions and exercise self-governance by societal expectations and norms, frequently influenced and strengthened by different types of power and communication (Dean, 2002).

Virtual reality platforms in artificial intelligence in education serve as intermediaries for disseminating and controlling knowledge (Rane *et al.*, 2023). While virtual reality (VR) has the capacity to enhance the accessibility of specific forms of knowledge to a wider range of people, it also perpetuates current power

disparities by exerting control over the content and presentation of educational materials (Paras, 2020). This framework developed by Foucault enables a thorough examination of how artificial intelligence affects the creation and dissemination of knowledge in educational institutions (Chen *et al.*, 2020). Incorporating multimedia and automated grading systems within Learning Management Systems (LMS) can be analyzed through Michel Foucault's notions of discipline, power, and knowledge (Brenden, 2023).

Foucault's notion of disciplinary power is applicable in this context, as proctoring can be regarded as a means of exercising authority and upholding order within educational establishments (Lee & Fanguy, 2022). Osei-Nimo *et al.*, (2023) argue that Foucault's notions of discipline, power, and knowledge provide a useful framework for examining the incorporation of proctoring for ongoing evaluation in educational settings. The concepts of discipline, power, and knowledge proposed by Michel Foucault offer a distinctive perspective for examining Blockchain technology concerning graduation certification in higher education (Hashim *et al.*, 2022).

In essence, Foucault's notion of the Panopticon, a fundamental concept in his investigation of surveillance and authority, provides a captivating perspective to examine the application of drone technology in agriculture (Morrison, 2016). Foucault's concept of power dispersal, characterised by its decentralization and distribution across institutions and norms, is reflected in the decentralization of observation enabled by drones (De Wet, 2022). This phenomenon has shifted the conventional surveillance authority to various entities such as government, military, and private corporations (Abraham, 2023).

5. Discourse and Truth

Foucault's notion of discourse elucidates how AI-driven educational programmes influence the perception of truth and reality (Foucault, 2020a). Examination of virtual reality learning conversations reveals concealed power dynamics that influence students' comprehension of topics, reflecting the societal standards and strengthening educational hierarchies (Zúñiga, 2007). Discourse formations surrounding AI technologies in education shape narratives, including efficiency, innovation, and advancement (Williamson & Eynon, 2020). This literature on Foucault's notion of discourse and truth is an essential contribution to the ongoing discussion, aiming to enhance our understanding of the complex relationship between AI and the future of higher education (Hasa, 2023).

The integration of multimedia components such as virtual reality (VR) learning experiences into Learning Management Systems (LMS) adds a dynamic dimension to educational communication (Hidalgo *et al.*, 2019). This feature facilitates the delivery of information, construction of narratives, shaping of interactions, and transmission of implicit messages (Díaz Redondo *et al.*, 2021). VR studios are designed to provide an immersive learning and skill development environment. Foucault cautions against accepting these narratives as indisputable truths, urging the critical examination of prevailing discourses to uncover concealed priorities in AI education (Messeri, 2024). Foucault's analysis is highly perceptive

and influential in the construction of truth and reality when examining virtual reality (VR) learning experiences within multimedia materials and explicitly auto-marking machine learning modules integrated into Learning Management Systems (LMS) (Aspland & Rudolph, 2022). Automated machine learning tools in Learning Management Systems (LMS) use algorithms to evaluate student work according to predetermined criteria and patterns from training data (Tetteh *et al.*, 2023). The criteria represent the algorithm's embedded institutional norms, educational standards, and societal values.

An analysis of the integration of drone technology in education using Foucault's perspective allows us to explore how the discussions surrounding these technologies influence students' comprehension of academic content (Bracken-Roche, 2018). In the educational context, Foucault's notion of discourse compels us to examine how the narratives, representations, and interactions offered by VR, Blockchain, LMS, and drone-based learning experiences contribute to the construction of truth and reality (Nemorin *et al.*, 2023). Drones are commonly presented as valuable instruments for augmenting security and surveillance, whereas 3D printing is depicted as promoting ingenuity and experiential education (Maghazei & Netland, 2020). Integrating blockchain technology is a viable approach to verify credentials and ensure the integrity of data, fostering trust and transparency (Hellani *et al.*, 2021). Foucault's theory of disciplinary power emphasises the imposition of societal norms and behaviours (Lynch, 2014). Drone surveillance fosters a culture of normalisation, subtly shaping social control as individuals internalise and adjust their behaviours based on surveillance data (Hu, 2024).

AI algorithms may facilitate the analysis and interpretation of data stored on the blockchain, exerting an impact on educational discourse (Han, 2022). These algorithms can prioritise specific categories of information or viewpoints, influencing students' understanding of the subject matter (Nemorin *et al.*, 2023). Foucault's framework prompts us to rigorously examine how these algorithms mirror and sustain power dynamics and the generation of knowledge within educational contexts (Bucher, 2018). An analysis of Foucault's ideas using blockchain technology approaches to certifications reveals its capacity to disperse and democratise disciplinary power and knowledge processes in higher education (Lall, 2023). This signifies a shift from centralised models of control and verification to distributed and transparent systems, reshaping the power and knowledge dynamics within the academic domain.

Utilising artificial intelligence algorithms in proctoring enhances monitoring and regulation in education, observing and analysing student behavior during evaluations to enforce disciplinary norms and standards (Lim *et al.*, 2023). Foucault's theoretical framework prompts us to analyse how these algorithms represent and strengthen power dynamics inside the educational system (Bucher, 2018). Through the analysis of the discourses present in virtual reality (VR) learning experiences and the features of proctoring, it is possible to reveal concealed power dynamics that influence students' understanding of academic content (Close *et al.*, 2024). The present study aims to elucidate the dynamics of knowledge privilege or

marginalisation within educational settings and their consequential impact on perceptions of truth and reality (Secules *et al.*, 2021).

6. Reflections on Foucault's Biopower and Technologies of the Self

Applications of virtual reality in education introduce novel aspects to Foucault's self-technological concept. Artificial intelligence education has the potential to significantly influence individuals' self-perception by deeply engaging them in virtual environments (Russo *et al.*, 2021). VR studios facilitate users in regulating and manipulating their own experiences through immersive environments (Han *et al.*, 2024). Self-technologies integrate with AI platforms to facilitate personalised learning in the Fourth Industrial Revolution era, but they require effective governance (Joshi *et al.*, 2024). Foucault's concept of biopower and self-technologies raises ethical concerns regarding self-monitoring, data management, and AI decision-making in education (Musarrat, 2022). The present study builds upon Foucault's original investigation of biopower by incorporating the impact of technology on our understanding of personal identity and agency, particularly in the context of education (Sumitro *et al.*, 2020). Successfully managing the balance between biopolitical control, individual agency, and empowerment is essential for fostering a responsible and inclusive AI ecosystem in education. In the context of virtual reality and multimedia integration, namely in Learning Management Systems (LMS), Foucault's analysis can provide insight into the impact of AI-enabled education on the way identity and agency are perceived in educational environments (Garg *et al.*, 2020). Through the application of Foucault's framework, an analysis of the effects of AI-driven automated marking in LMS platforms reveals how technology shapes individual identity and agency concepts. This expands Foucault's exploration of biopower to encompass the role of technology in shaping our understanding of individual identity and capacity to act in the field of education (Chouliaraki & Georgiou, 2022).

Automation of data analysis and flight navigation tasks using artificial intelligence (AI) in drone technology can significantly improve educational experiences. According to Hernandez-de-Menendez *et al.*, (2020), AI algorithms can potentially mould students' interactions and experiences in virtual reality (VR) settings, impacting their self-perception and abilities assessments. Foucault's analysis of biopower, which explores the mechanisms by which power exerts control over bodies and communities, can also encompass the influence of technology on personal identity and autonomy (Rabinow & Rose, 2003). The biopower system in education utilizes technologies such as drones and blockchain to control and manage physical bodies, behaviours, and data (De Wet, 2022). Drones facilitate spatial regulation and surveillance, while blockchain technology controls the management and verification of data (Jensen, 2016; Vo *et al.*, 2018). The data gathered by drones contributes to an extensive reservoir of knowledge, emphasising Foucault's claim that knowledge is synonymous with power (Bloomberg, 2019). In the context of drone surveillance, this information can be utilised to exert influence or manipulate

the actions of individuals or groups, so reflecting Foucault's concept that knowledge functions as a means of control and regulation (Abraham, 2023).

Furthermore, the use of drone technology in education has a substantial impact on the formation of individuals' self-perception and their cognitive capacities within educational settings (Hernandez-de-Menendez *et al.*, 2020). The theory of disciplinary power proposed by Foucault emphasises the control and manipulation of social norms and behaviours (Hoffman, 2014). Simultaneously, drone surveillance plays a role in fostering a culture of normalisation, whereby behaviours are shaped by surveillance data, insidiously exerting social control as individuals internalise these standards and adapt their behaviour accordingly (Taljaard, 2020). With its decentralised and transparent ledger system, blockchain technology provides secure opportunities for certificate verification, record-keeping, and transactions in educational settings (Steu, 2020). In education, blockchain technology can influence individuals' perceptions of their identities and abilities by offering an unalterable and unchangeable documentation of accomplishments and engagements (Alshahrani, 2023).

7. Conclusion

Foucault's concepts of power and knowledge provide a complex framework for understanding the implications of AI in education. Foucault's governmentality theory provides a useful perspective for revealing power distribution in education facilitated by artificial intelligence. Through a rigorous analysis of how institutions control behaviour, oversee the creation of knowledge, and implement technologies, as well as the mechanisms of surveillance and control, knowledge and power dynamics, discourse formations, and biopolitical influences, stakeholders can effectively and responsibly navigate the intricate nature of AI technologies. The present study highlights the significance of ethical governance and reflexivity in influencing a fair and liberating educational setting driven by advancements in artificial intelligence. This paper aims to enhance the ongoing debates on the ethical, social, and pedagogical implications of incorporating artificial intelligence (AI) into educational settings. Utilising Michel Foucault's concepts, namely regarding power, knowledge, surveillance, and control, enables a more profound understanding of how AI technologies transform educational methods and cultural standards.

A comprehensive analysis of the surveillance systems, knowledge hierarchies, communication methods, and self-improvement technologies found in AI-driven educational environments can unveil the underlying power dynamics that shape contemporary learning experiences. This perspective presents a critical analysis shaped by Foucault's theoretical framework. Although these technologies show potential for distributing authority, providing accessibility of knowledge to a broader audience, and transforming conventional hierarchical systems in education, they also bring about new difficulties concerning monitoring, privacy, and the continuation of unequal distribution of political power. By rigorously analysing these technologies using Foucault's framework, the study reveals how they shape perceptions of truth and reality, alter power dynamics, and affect the development of individual identities

within educational institutions. This analysis offers essential insights for negotiating technological progress's ethical and practical consequences in education. It is crucial to ensure that the role of AI in education is carefully examined, regulated with prudence, and ultimately aimed at serving the best interests of all parties involved, particularly the students, in a swiftly changing environment.

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