

Platformization of education: algorithmic governance, digital sovereignty, and critical education

Abstract

Digital platforms have profoundly transformed educational systems by reshaping teaching practices, learning environments, and institutional governance. This review article examines how platform capitalism and algorithmic governance have reconfigured education through processes of datafication, digital surveillance, and technological dependency. Drawing upon a qualitative bibliographic review grounded in contemporary critical literature, the study articulates contributions from Nick Srnicek's theory of platform capitalism, Shoshana Zuboff's surveillance capitalism, Neil Selwyn's critical studies of educational technology, and recent discussions on digital sovereignty and educational governance. Four analytical dimensions emerged from the review: (i) the platformization of educational systems; (ii) algorithmic governance and educational data; (iii) digital sovereignty and technological dependence; and (iv) critical education within platform society. The analysis demonstrates that digital platforms have become infrastructures that simultaneously organize pedagogical practices, collect and monetize educational data, and influence institutional decision-making. Consequently, education increasingly operates under algorithmic rationalities that extend beyond technological mediation to reshape educational autonomy, public governance, and the production of knowledge. The article concludes that confronting these transformations requires strengthening digital sovereignty, promoting critical digital literacy, and developing public educational policies capable of balancing technological innovation with democratic values.

Keywords: platform capitalism, algorithmic governance, digital sovereignty, educational platforms.

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Introduction

The accelerated expansion of digital technologies has profoundly transformed contemporary education. Digital platforms, artificial intelligence, cloud computing, and algorithmic systems increasingly mediate pedagogical practices, institutional management, academic communication, and knowledge production. Educational environments that were once predominantly organized through face-to-face interactions now coexist with complex digital infrastructures operated by global technology corporations such as Google, Microsoft, Meta, Coursera, and OpenAI. These platforms have progressively become indispensable components of educational systems, influencing not only teaching and learning processes but also the governance of educational institutions themselves.

This transformation extends beyond the incorporation of digital technologies into classrooms. Rather, it represents a broader phenomenon commonly described as the platformization of education, whereby educational activities become increasingly dependent on privately owned digital infrastructures that organize communication, assessment, content distribution, and data management. As educational interactions migrate to digital environments, every pedagogical action – including classroom participation, assignment submission, online collaboration, and even student engagement – becomes susceptible to continuous data collection, algorithmic processing, and behavioral prediction.

Within this context, Nick Srnicek¹ argues that digital platforms constitute a new phase of capitalist development in which data become the primary economic resource. Unlike traditional industrial models, platform capitalism operates by transforming users' interactions into valuable assets capable of generating predictive analytics,

personalized services, and new forms of economic accumulation. Education has increasingly become integrated into this model as educational platforms collect large volumes of information regarding students' learning behaviors, cognitive performance, participation patterns, and institutional practices.

Shoshana Zuboff² expands this discussion through the concept of surveillance capitalism, emphasizing that contemporary digital infrastructures continuously extract behavioral data to predict and influence future actions. In educational settings, these dynamics become particularly significant because data generated by students and teachers no longer serve exclusively pedagogical purposes. Instead, they increasingly support algorithmic recommendation systems, automated decision-making, learning analytics, adaptive educational technologies, and commercial strategies that extend beyond institutional boundaries.

Recent studies conducted in Brazilian and Portuguese higher education have also demonstrated that platform capitalism has progressively reconfigured educational institutions through processes of digitalization, algorithmic mediation, and transnational technological dependence.^{3,4} These findings reinforce the need to examine educational platformization not only as a technological phenomenon but also as a structural transformation affecting institutional governance and pedagogical autonomy.

The growing dependence on digital platforms also raises important questions regarding educational governance and digital sovereignty. As schools and universities adopt proprietary technological ecosystems, decisions traditionally made by educators and public institutions increasingly become mediated by algorithms, software architectures, and corporate governance models. Recommendation systems, automated assessments, predictive analytics, and artificial

intelligence applications gradually reshape educational practices while simultaneously redefining institutional autonomy and pedagogical decision-making.

These developments generate significant tensions for contemporary education. On one hand, digital platforms offer unprecedented opportunities for expanding educational access, fostering collaboration, and supporting personalized learning experiences. On the other hand, they introduce new challenges related to data privacy, algorithmic transparency, technological dependency, educational inequalities, and the preservation of critical pedagogical practices. The widespread adoption of generative artificial intelligence further intensifies these debates by questioning traditional understandings of authorship, knowledge production, academic integrity, and teacher mediation.

Although the literature on educational technologies has expanded considerably over the past decade, important analytical gaps remain. Many studies examine digital tools from predominantly technical or pedagogical perspectives, whereas fewer investigations integrate the political economy of digital platforms, the dynamics of algorithmic governance, and the broader sociological implications of platform capitalism for educational systems. Understanding these interconnected processes requires theoretical frameworks capable of articulating technological infrastructures, economic rationalities, symbolic power, and educational governance within a comprehensive analytical perspective.

This article aims to examine how platform capitalism and algorithmic governance are reconfiguring contemporary education by transforming teaching practices, institutional autonomy, educational data governance, and knowledge production. Through a qualitative review of contemporary critical literature, the study analyzes the implications of platformization for educational governance, digital sovereignty, and the future of critical education in increasingly data-driven societies.

Methodology

This review article adopts a qualitative approach based on a critical bibliographic review of contemporary literature addressing the intersections between platform capitalism, algorithmic governance, digital education, and educational sovereignty. Rather than merely describing technological innovations, the study seeks to examine how digital platforms have transformed educational systems by reorganizing institutional practices, pedagogical relationships, and governance structures through the extensive collection and processing of educational data.

The methodological procedures were guided by an interpretative perspective that understands educational technologies not as neutral instruments, but as socio-technical infrastructures embedded within broader political, economic, and cultural processes. Consequently, the literature review prioritized theoretical and empirical studies capable of explaining the emergence of platformization as a structural characteristic of contemporary education.

The analytical corpus was composed of books, peer-reviewed journal articles, policy reports, and doctoral research published predominantly during the last decade, with particular emphasis on studies discussing digital platforms, surveillance capitalism, artificial intelligence, educational data governance, and digital sovereignty. Classical contributions that remain theoretically relevant to the debate were also incorporated to support the conceptual framework.

The review was organized around four complementary analytical categories that emerged from the literature:

- a) The platformization of educational systems;
- b) Algorithmic governance and educational data;
- c) Digital sovereignty and technological dependence; and
- d) Critical education within platform society.

These analytical dimensions enabled the articulation of contributions from different disciplinary fields – including Sociology, Education, Communication Studies, and Political Economy – thereby providing an interdisciplinary understanding of the transformations promoted by digital platforms in educational contexts.

Among the principal theoretical references are the works of Nick Srnicek,¹ whose concept of platform capitalism explains the economic logic underlying digital platforms; Shoshana Zuboff,² whose analysis of surveillance capitalism highlights the extraction and commercialization of behavioral data; Neil Selwyn,^{5,6} whose critical studies examine the implications of digital technologies for education; José van Dijck, Thomas Poell and Martijn de Waal,⁷ who discuss the platform society; Ben Williamson,^{8,9} whose investigations focus on educational governance and datafication; and Couldry and Mejias,¹⁰ whose concept of data colonialism expands the debate concerning digital sovereignty.

The analysis also incorporates educational perspectives grounded in Paulo Freire's¹¹ conception of critical education and Gert Biesta's¹² discussions on educational purpose, democratic formation, and teacher autonomy. These perspectives contribute to understanding how pedagogical practices may respond critically to the growing influence of algorithmic systems within educational environments.

Rather than seeking quantitative synthesis, the review emphasizes conceptual convergence across the selected literature, identifying common patterns, theoretical tensions, and emerging challenges associated with the platformization of education. This approach allows the discussion to move beyond technological determinism by examining how digital infrastructures reshape educational governance, institutional autonomy, and the production of knowledge under platform capitalism.

Results

Platformization of educational systems

The literature consistently indicates that digital platforms have become central infrastructures for the organization of contemporary educational systems. Initially introduced as technological tools intended to facilitate communication and learning management, platforms such as Google Classroom, Microsoft Teams, Moodle, Coursera, Canvas, and more recently ChatGPT, now mediate a wide range of educational activities, including content distribution, assessment, institutional communication, collaborative work, and academic administration.

According to Srnicek,¹ platforms differ from conventional digital services because their economic value derives primarily from their capacity to collect, process, and monetize data generated by users. Within educational environments, this dynamic transforms everyday pedagogical interactions into continuous sources of information regarding learning behaviors, participation patterns, cognitive performance, and institutional routines.

Educational platformization therefore represents more than the digitalization of teaching. It constitutes a structural transformation in which educational institutions progressively depend upon proprietary technological ecosystems developed and controlled by multinational corporations. As these platforms become deeply integrated into institutional routines, schools and universities increasingly adopt technological architectures whose governance, operational logic, and algorithmic infrastructures remain largely external to public educational control.

This process intensified considerably following the COVID-19 pandemic. Emergency remote teaching accelerated the adoption of digital platforms worldwide, consolidating them not merely as temporary solutions but as permanent components of educational systems. Consequently, platform-mediated education has evolved into a hybrid environment where face-to-face and digital interactions coexist under infrastructures that continuously generate educational data.

The reviewed literature emphasizes that this dependence produces significant institutional consequences. Platform providers increasingly influence educational policies, pedagogical practices, curriculum organization, and even institutional planning by determining which functionalities become available, how educational interactions are structured, and which forms of participation receive greater visibility within digital environments.

From this perspective, educational platforms should be understood not simply as technological innovations but as socio-technical infrastructures that reorganize educational processes according to the economic and political rationalities characteristic of platform capitalism.

Algorithmic governance and educational data

Beyond the expansion of digital platforms, the literature identifies algorithmic governance as one of the defining characteristics of contemporary educational systems. Unlike conventional educational technologies, algorithmic systems continuously collect, classify, process, and interpret data generated by teachers, students, and institutions, transforming educational interactions into measurable variables capable of informing automated decisions.

This process is commonly associated with educational datafication, whereby pedagogical activities become translated into digital traces that can be monitored, quantified, and analyzed through computational techniques. Attendance records, assignment submissions, online discussions, assessment performance, browsing behavior, response times, and engagement indicators collectively constitute extensive databases that increasingly support institutional management and pedagogical decision-making.

Williamson^{8,9} argues that educational governance has progressively incorporated algorithmic systems capable of producing predictive analyses concerning students' academic performance, dropout risks, learning trajectories, and behavioral patterns. These technologies promise greater efficiency, personalization, and administrative optimization. However, they simultaneously redefine educational authority by transferring part of pedagogical decision-making from educators to computational systems.

Learning Analytics exemplifies this transformation. Through statistical models and artificial intelligence, educational platforms identify behavioral patterns, recommend learning pathways, generate automated feedback, and produce indicators intended to improve academic performance. Although such systems may support teachers'

work, they also establish new forms of algorithmic mediation capable of influencing educational processes in ways that often remain opaque to both educators and students.

Generative artificial intelligence has further intensified these transformations. Applications capable of producing texts, images, programming code, and educational resources increasingly participate in teaching and learning activities. Consequently, artificial intelligence no longer functions merely as an auxiliary technological resource but progressively assumes roles traditionally associated with pedagogical mediation, raising important questions regarding authorship, evaluation, intellectual autonomy, and the production of academic knowledge.

The reviewed literature emphasizes that algorithmic governance should not be understood exclusively as a technological phenomenon. Rather, it constitutes a political and institutional process through which algorithms organize educational visibility, prioritize specific forms of participation, recommend content, classify performance, and influence institutional decision-making. These mechanisms frequently operate through proprietary computational models whose internal functioning remains inaccessible to educational communities.

Moreover, personalization – often presented as one of the principal advantages of educational technologies – also reflects broader dynamics associated with platform capitalism. Recommendation systems continuously adapt educational content according to behavioral data, previous interactions, and predicted preferences. While personalization may improve learning experiences in certain contexts, excessive dependence on algorithmic recommendations may restrict intellectual diversity, reinforce previously established learning patterns, and reduce opportunities for critical engagement with alternative perspectives.

Consequently, educational governance increasingly becomes intertwined with algorithmic infrastructures that extend beyond classroom management. Algorithms not only support educational activities but actively participate in defining how knowledge circulates, how learning is evaluated, and how institutional decisions are produced within contemporary educational systems.

Digital sovereignty and technological dependence

One of the most significant concerns emerging from the literature concerns the growing dependence of educational institutions on digital infrastructures owned and governed by multinational technology corporations. As schools and universities increasingly rely on proprietary platforms to organize teaching, communication, assessment, research, and institutional management, important questions arise regarding digital sovereignty, technological autonomy, and public control over educational data.

Digital sovereignty refers to the capacity of institutions and governments to govern their own technological infrastructures, regulate data flows, and preserve decision-making autonomy within digital environments. In education, this concept acquires particular relevance because educational data constitute strategic informational assets that describe not only institutional activities but also learning processes, cognitive development, behavioral patterns, and social interactions involving millions of students and educators.

The literature demonstrates that contemporary educational systems increasingly operate within technological ecosystems dominated by a limited number of global corporations. Platforms such as Google Workspace for Education, Microsoft 365 Education, Canvas, Blackboard, Coursera, and other digital services provide essential

infrastructures for educational activities while simultaneously concentrating large volumes of educational data under private governance.

This concentration generates multiple forms of dependency. First, educational institutions frequently become technologically dependent upon proprietary software architectures whose functionalities, pricing models, and operational conditions are defined externally. Second, institutions often possess limited control over the storage, processing, interoperability, and long-term governance of educational information. Third, algorithmic systems responsible for organizing educational interactions generally remain protected as commercial intellectual property, limiting transparency and democratic oversight.

These concerns become particularly relevant within higher education, where digital platforms increasingly mediate research activities, academic publishing, international collaboration, and continuing education. Massive Open Online Courses (MOOCs), digital certification systems, cloud-based learning environments, and artificial intelligence services contribute to expanding educational opportunities while simultaneously reinforcing global asymmetries regarding technological production and data governance.

Couldry and Mejias¹⁰ describe similar dynamics through the concept of data colonialism, arguing that contemporary societies experience new forms of appropriation in which human activities become continuous sources of extractable data. Although education differs substantially from commercial digital markets, the extensive collection of educational data reflects comparable logics of accumulation, surveillance, and value extraction.

Within this context, digital sovereignty extends beyond questions of cybersecurity or legal compliance. It encompasses broader discussions concerning educational autonomy, public governance, democratic accountability, and the capacity of educational institutions to define their own technological strategies. Protecting educational data therefore requires not only regulatory frameworks such as data protection legislation but also public investments capable of strengthening open technological infrastructures, institutional digital capacities, and national strategies for educational innovation.

The literature consequently argues that debates concerning educational technologies cannot remain restricted to pedagogical efficiency or technological innovation. They must also incorporate political discussions regarding technological dependence, public governance, algorithmic transparency, and the long-term implications of platform capitalism for educational systems.

Critical education in the age of platform capitalism

The expansion of digital platforms has intensified discussions regarding the purposes of education in increasingly data-driven societies. Although digital technologies broaden access to information and diversify pedagogical practices, they also reshape educational relationships according to algorithmic rationalities that prioritize efficiency, personalization, and continuous data extraction. Consequently, education faces the challenge of balancing technological innovation with the preservation of critical, democratic, and human-centered pedagogical principles.

Critical educational theorists argue that technologies should not be understood as neutral tools but as socio-technical systems embedded within broader political and economic structures. From this perspective, platform capitalism influences not only how educational content is delivered but also how knowledge is produced, circulated, and legitimized within educational environments.

Freire's conception of critical education remains particularly relevant in this context. Rather than accepting digital technologies as inevitable or inherently beneficial, educators are encouraged to critically examine their social implications, promoting dialogue, autonomy, and reflective engagement with technological transformations. Similarly, Biesta emphasizes that education should not be reduced to measurable outcomes or data-driven performance indicators, but should continue fostering subjectivity, democratic participation, and human development.

The reviewed literature therefore suggests that critical digital literacy should become a central component of contemporary education. Beyond developing technical competencies, students and teachers should be prepared to understand how algorithms organize information, how digital platforms influence behavior, and how educational data are collected and used. Such competencies contribute to strengthening educational autonomy and democratic participation within increasingly platformized societies.

Discussion and educational implications

The reviewed literature demonstrates that platform capitalism has substantially transformed contemporary education by integrating digital infrastructures into virtually every dimension of educational activity. Platforms have evolved from instructional tools to institutional infrastructures that organize communication, assessment, knowledge production, and administrative management.

This transformation can be understood through Srnicek's¹ concept of platform capitalism, in which data constitute the primary source of economic value. Within education, pedagogical interactions become continuous flows of information capable of supporting algorithmic recommendation systems, learning analytics, and predictive educational models.

Zuboff's² notion of surveillance capitalism further explains how these data extend beyond pedagogical purposes, becoming strategic assets for behavioral prediction and institutional governance. Consequently, educational platforms simultaneously mediate teaching and learning while expanding mechanisms of digital surveillance.

From an educational perspective, Selwyn⁵ and Williamson⁹ argue that these processes redefine educational governance by introducing algorithmic systems into institutional decision-making. Rather than replacing teachers, algorithms increasingly influence curriculum organization, student monitoring, performance evaluation, and educational planning.

These transformations also reinforce debates concerning digital sovereignty. As educational institutions become increasingly dependent on proprietary technological infrastructures, questions regarding transparency, public governance, and institutional autonomy become central to educational policy. Digital sovereignty therefore emerges not merely as a technological issue but as a strategic condition for preserving democratic governance and educational independence.

Overall, the literature suggests that the principal challenge is not the adoption of digital technologies themselves, but the development of educational policies capable of ensuring that technological innovation remains aligned with ethical principles, public interests, and the broader educational mission of promoting critical citizenship.

The findings of this review indicate that educational policies should move beyond the simple incorporation of digital technologies into teaching and learning processes. Instead, policymakers and educational institutions should adopt governance strategies capable of

ensuring transparency, accountability, and public oversight regarding the use of digital platforms and educational data.

Teacher education also emerges as a strategic priority. Beyond developing technical competencies, educators should be prepared to critically understand algorithmic systems, artificial intelligence, and the political economy of digital platforms. Such preparation may strengthen pedagogical autonomy while enabling more informed decisions regarding the selection and use of educational technologies.

Furthermore, educational institutions should promote policies that reinforce digital sovereignty through investments in open technologies, data governance frameworks, and transparent partnerships with technology providers. Reducing excessive dependence on proprietary platforms may contribute to preserving institutional autonomy and protecting educational data.

Finally, digital literacy should be understood as a critical educational objective rather than merely a technical skill. Students should be encouraged to understand how algorithms organize information, shape online interactions, and influence knowledge production. Developing these competencies is essential for democratic participation in increasingly platformized societies.

Conclusion

The platformization of education represents one of the most significant transformations affecting contemporary educational systems. Digital platforms have evolved from technological tools into strategic infrastructures that mediate teaching, learning, institutional management, and knowledge production.

The literature reviewed demonstrates that these transformations cannot be understood exclusively through technological perspectives. Platform capitalism, algorithmic governance, and surveillance capitalism constitute complementary analytical frameworks for explaining how educational data have become strategic resources within contemporary digital economies.

Although digital platforms offer important opportunities for expanding educational access and supporting pedagogical innovation, they also generate challenges related to technological dependence, algorithmic transparency, data governance, and educational sovereignty. Consequently, educational institutions must balance technological innovation with ethical responsibility, democratic governance, and the preservation of pedagogical autonomy.

Future research should further investigate the long-term impacts of artificial intelligence, learning analytics, and educational platformization on teaching practices, curriculum development, and institutional governance. Comparative studies involving different national educational systems may also contribute to understanding

how public policies can strengthen digital sovereignty while fostering equitable and democratic educational environments.

Ultimately, education should not merely adapt to digital transformation but actively participate in shaping its ethical, political, and pedagogical directions. Strengthening critical digital literacy, institutional autonomy, and democratic governance will be fundamental to ensuring that digital technologies contribute to educational development without compromising the public mission of education.

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Conflicts of interest

The author declares that there is no conflicts of interest.

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