

Systematic Review

DIGITAL EXPLOITATION IN E-LEARNING: PLATFORM POWER, DATAFICATION, LEARNER AGENCY, AND THE EMERGENCE OF DIGITAL EDUCATIONAL JUSTICE

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Abstract: The rapid expansion of digital and online education has transformed access to learning, communication, assessment, and educational resources. However, the increasing dependence of education on digital platforms raises critical questions concerning learner autonomy, datafication, privacy, platform dependency, artificial intelligence (AI), commercialization, and the distribution of value generated through digital participation. This article develops the concept of Digital Exploitation in E-Learning (DEE) and proposes a theoretical framework for understanding how apparently beneficial digital educational systems may produce extractive relationships under conditions of unequal technological and informational power. Drawing upon a critical synthesis of scholarship on platformization, datafication, learner agency, artificial intelligence, digital inequality, and educational governance, this study argues that digital exploitation cannot be reduced to financial overcharging or technological exclusion. Rather, it involves the systematic extraction of financial, temporal, informational, academic, behavioral, and attentional value from learners while their capacity to understand, negotiate, or challenge these processes remains constrained. Evidence concerning learner ownership emphasizes learner-centered design, accessible infrastructure, and resilient support ecosystems, while research in Global South contexts identifies heightened concerns surrounding access, AI readiness, privacy, agency, and systemic inequality (Sembiring, 2026, pp. 649–650; Van den Berg, 2026, pp. 807–808). The article proposes an integrated DEE Model connecting digitalization, platformization, dependency, information asymmetry, datafication, value extraction, and agency/capability effects, moderated by digital literacy, transparency, privacy protection, human oversight, accountability, and redress. Ultimately, this study contributes a theory-building framework for future empirical research and advances the conceptual foundations of Digital Educational Justice.

Keywords: Digital Exploitation in E-Learning; E-Learning, Platformization, Datafication, Learner Agency, Artificial Intelligence, Digital Inequality, Educational Governance, Digital Educational Justice.

1.0 INTRODUCTION

1.1 Background

Digital technologies have become deeply embedded in contemporary education. Learning Management Systems (LMS), virtual classrooms, digital assessment platforms, learning analytics, mobile learning applications, and generative artificial intelligence (AI) increasingly mediate educational participation.

This transformation has created substantial opportunities. Digital education can improve instructional flexibility, expand access to educational resources, and support personalized forms of learning. Research on learner ownership similarly emphasizes the importance of learner-centered design, accessible infrastructure, and resilient support ecosystems in creating meaningful digital learning environments (Sembiring, 2026, pp. 649–650).

However, digitalization fundamentally alters the structural relationships through which education is delivered. The traditional educational relationship can broadly be represented as:

Teacher→Learner→Knowledge

Digital education introduces additional commercial actors, technological intermediaries, and complex data infrastructures:

Learner→Institution→Platform→Data Infrastructure→Algorithmic Systems

This structural shift introduces critical questions regarding who controls educational infrastructure, who possesses data regarding learners, who determines the rules governing digital participation, and who captures the value generated through digital interaction. The issue is particularly acute because digital platforms do not merely transmit educational content; they record, track, analyze, and classify learner activity. Consequently, the learner is transformed into both a consumer of educational services and a producer of educational data. This transformation forms the core of the concept of Digital Exploitation in E-Learning (DEE) developed in this study.

1.2 The Emerging Problem

Conventional discourses surrounding digital education frequently center on technological access. Dominant inquiries typically ask:

- Can learners access a high-speed internet connection?
- Do learners possess suitable hardware devices?
- Can educational institutions scale online courses?

- Are educators sufficiently trained in digital competencies?
- Does technology enhance overall educational efficiency?

While these questions remain necessary, they are insufficient. A learner may possess modern hardware, continuous internet connectivity, and an active platform account while having minimal structural visibility into:

- What granular data are actively collected;
- How those data are analyzed, modeled, or commercialized;
- Which third parties gain access to their data profiles;
- How underlying algorithms influence educational outcomes and institutional decisions;
- What commercial or secondary value is extracted from their digital footprint, and
- What institutional mechanisms exist to challenge opaque platform practices?

Consequently, technological inclusion does not automatically produce learner agency. Genuine learner ownership requires the explicit ability to set goals, direct learning pathways, access open resources, and adapt to changing educational environments (Sembiring, 2026, p. 649). The DEE framework therefore, establishes a foundational distinction: a learner can be digitally included while remaining informationally, economically, or institutionally vulnerable.

1.3 Statement of the Problem

The rapid platformization of education has created a complex, asymmetrical relationship between educational participation and technological infrastructure. While platforms facilitate learning, they simultaneously create structural conditions of dependency, information asymmetry, persistent surveillance, data extraction, commercial exploitation, algorithmic influence, and diminished learner agency. This problem is particularly pronounced in contexts where learners lack meaningful alternatives to institutionally mandated platforms.

Global South contexts introduce additional systemic complexity. Infrastructure availability, affordability, digital literacy, and technological readiness remain unevenly distributed. Research within South African open distance learning (ODL), for example, highlights critical concerns regarding human agency, data privacy, structural inequality, and the digital divide in the adoption of AI-supported educational technologies (Van den Berg, 2026, p. 807). Existing scholarship routinely examines these concerns in isolation; thus, there is an urgent need for an integrated theoretical model explaining how digital participation transitions into platform dependency and value extraction, and under what conditions this constitutes exploitation.

1.4 Research Gap

Existing literature presents valuable but fragmented strands of knowledge:

- **Datafication Scholarship:** Analyzes how educational practices are translated into quantifiable data points (Selwyn & Gašević, 2020; Williamson, 2017).

- **Learning Analytics Research:** Investigates agency, algorithmic bias, equity, and procedural transparency (Tsai et al., 2020).
- **Platformization Studies:** Examines the structural penetration of commercial Big Tech platforms into public educational institutions (Williamson et al., 2020).
- **Educational AI Research:** Evaluates personalization, automation, ethics, and cognitive impact (OECD, 2026; Zhang et al., 2024).
- **Digital Inequality Literature:** Focuses on disparities in access, hardware, skills, and regional participation (Bulathwela et al., 2024; Van den Berg, 2026).

However, these distinct fields have rarely been synthesized into a unified theoretical framework explaining exploitation within e-learning environments. This study fills this gap by addressing the primary research question: When does digitally mediated educational participation transition beyond standard technological dependency or digital inequality to become an operationalized form of exploitation?

1.5 Purpose of the Study

The purpose of this article is to conceptualize and theoretically ground Digital Exploitation in E-Learning (DEE) and to formulate a comprehensive framework through which digital educational systems can be evaluated regarding power, value extraction, learner agency, systemic capabilities, and institutional governance.

1.6 Objectives

1. To examine the technological, informational, and economic mechanisms through which exploitation emerges within digitally mediated educational environments.
2. To analyze the systemic interactions among platform dependency, datafication, power asymmetry, and learner agency.
3. To construct a theoretical DEE framework aimed at enhancing transparency, governance, learner capability, and Digital Educational Justice.

1.7 Research Questions

- **RQ1:** What technological, informational, and economic processes construct the structural conditions for Digital Exploitation in E-Learning?
- **RQ2:** How do platform dependency, datafication, and power asymmetries impact learner agency and cognitive capabilities?
- **RQ3:** How can educational institutions, technology developers, and regulatory bodies establish governance frameworks to mitigate and prevent DEE?

2.0 CRITICAL LITERATURE REVIEW

2.1 Introduction

This literature review critically synthesizes the foundational theoretical scholarship underpinning the DEE framework. Rather than viewing digital learning environments as inherently emancipatory or harmful, this review evaluates the structural tensions between technological access and learner agency, innovation and systemic dependency, data analytics and privacy, and adaptive personalization and algorithmic surveillance.

2.2 Digitalization and the Transformation of Education

Digitalization has redefined higher education by offering flexible content access, asynchronous collaboration, and scalable instruction. However, digital transformation is not technologically neutral. When educational Delivery relies on proprietary platforms, educational organizations increasingly conform to the technical architecture, business models, and data requirements of external platform providers. This represents a shift from education utilizing technology to education organized by technology.

2.3 Platformization of Education

Platformization describes the deep penetration of platform architectures, infrastructure, and governance into educational systems (Williamson et al., 2020). Platforms govern:

- Content delivery and curation;
- Communication and peer interaction;
- Automated assessment and grading;
- Learning analytics and behavioral tracking;
- Administrative workflows; and
- AI-driven instructional systems.

This integration creates technological lock-in. As institutional reliance on specific platforms increases, the switching costs become prohibitively high, preventing learners and educators from operating independently. The DEE framework conceptualizes this as **platform dependency**. While dependency alone does not constitute exploitation, it creates exploitative potential when the platform controller holds disproportionate informational, economic, or legal power over a captive user base.

2.4 Datafication of Education

Datafication is a key mechanism of DEE. Selwyn and Gašević (2020) locate higher education datafication within a broad transformation where educational processes are translated into actionable digital metrics. Williamson (2017) highlights how computational big data shapes policy, pedagogy, and institutional practices. Within digital platforms, basic educational engagement—reading text, watching video lectures, submitting assignments, participating in forums—is converted into continuous telemetry:

Learning Activity→Measurable Metrics→Analysable Data→Extracted Value

The theoretical concern of DEE centers on ownership: Who owns, controls, and profits from the intellectual and behavioral value derived from learner data?

2.5 Learner Agency

Learner agency is critical to determining whether digital systems empower or marginalize students. Sembiring (2026) defines learner ownership through a student's capacity to direct goals, self-regulate learning processes, leverage educational resources, and adapt to structural challenges (p. 649). A learner who understands platform operations,

retains meaningful technological choices, and possesses mechanisms to contest automated decisions exhibits high agency. Conversely, a learner forced to submit to opaque algorithmic monitoring without alternatives experiences suppressed agency. The DEE framework defines functional agency as:

$$\text{Agency} = \text{Knowledge} + \text{Choice} + \text{Capability} + \text{Participation} + \text{Redress}$$

2.6 AI and the New Educational Dependency

Generative AI and automated tutoring systems introduce new dynamics to digital learning. AI models can offer personalized feedback, automated formatting, accessible content, and administrative efficiency (Zhang et al., 2024). However, AI implementation can also induce profound dependencies. While AI can foster autonomy when implemented alongside robust digital literacy, it presents systemic risks regarding algorithmic bias, surveillance, and privacy loss (Sembiring, 2026; Van den Berg, 2026).

Furthermore, the OECD (2026) highlights that overreliance on generative AI tools can improve short-term task performance while degrading deep cognitive engagement and knowledge retention, as essential cognitive effort is outsourced to algorithms. DEE frames AI dependency as a conditional risk where educational labor and critical cognition are surrendered to proprietary algorithmic infrastructures.

2.7 Digital Inequality and the Global South

Digital inequality encompasses more than disparities in physical infrastructure. It includes structural variations in digital literacy, technical confidence, institutional support, internet connectivity, and the capacity to exercise meaningful informed consent (Bulathwela et al., 2024).

Studies in Global South settings—such as South African open distance learning environments—demonstrate that digital transformation often exacerbates existing socioeconomic vulnerabilities, locking learners into sub-optimal technological systems without adequate regulatory safeguards (Van den Berg, 2026, pp. 807–808). Consequently, providing equal access to a platform does not guarantee equal capacity to benefit from it or defend against extractive platform practices.

2.8 Privacy, Surveillance, and Information Asymmetry

Privacy in educational technology extends beyond securing personal data against external breaches (Drachsler & Greller, 2016; Prinsloo & Slade, 2017). In the DEE model, the critical inquiry is structural: Who holds complete analytical visibility over the learner, how is that data used to influence educational trajectories, and can the learner challenge those assessments?

When institutions and platform vendors possess vast predictive insights regarding student behavior, performance, and attentional focus while students remain completely ignorant of how those systems operate, severe **information asymmetry** occurs. This structural opacity is a direct prerequisite for digital exploitation.

2.9 From Data Collection to Value Extraction

Data collection becomes exploitative when it enables uncompensated value extraction. The DEE framework identifies six primary dimensions of extraction within educational platforms:

Extraction Dimension	Operational Mechanism
1. Financial Extraction	Mandatory software subscriptions, platform access fees, proprietary hardware requirements, and micro-transactions.
2. Temporal Extraction	Excessive time spent navigating opaque user interfaces, performing manual verification tasks, or engaging in uncompensated digital labor.
3. Informational Extraction	Harvesting personal identification details, demographic profiles, learning logs, and academic performance telemetry.
4. Academic Extraction	Capturing student-generated essays, codebase submissions, and creative projects to train commercial proprietary AI models without consent or compensation.
5. Behavioral Extraction	Tracking attention metrics, dwell time, clickstreams, mouse movements, and eye-tracking data to build behavioral prediction models.
6. Attentional Extraction	Deploying gamified interface elements, notifications, and engagement loops designed to maximize platform dwell time for platform monetization.

2.10 Theoretical Integration

The DEE framework synthesizes four foundational theoretical perspectives:

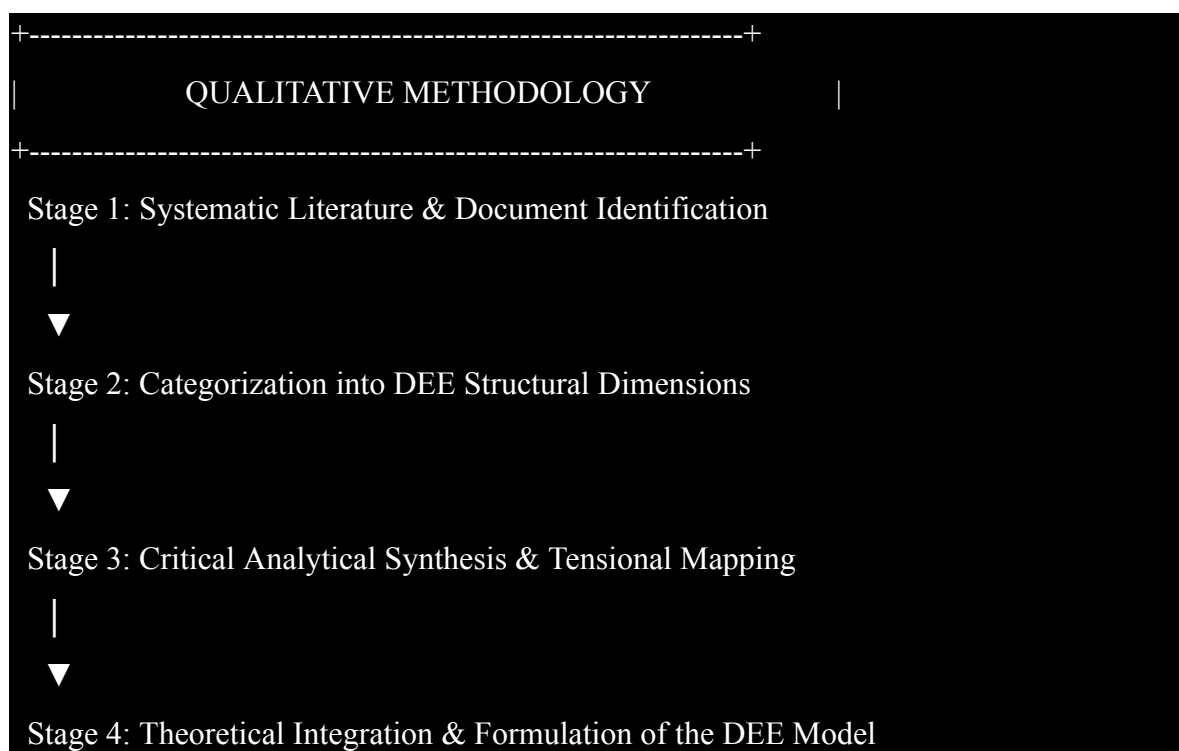
1. **Power Theory (Foucault; Bourdieu):** Explains structural inequality, institutional discipline, and asymmetric control within platform ecosystems.
2. **Critical Digital Pedagogy (Freire; Selwyn):** Examines learner agency, digital emancipation, democratic participation, and resistance to educational commodification.

3. **Platform Capitalism and Datafication (Srnicek; Zuboff):** Provides the analytical tools to examine technological lock-in, commercial data capture, behavioral surplus, and capital extraction.
4. **Capabilities Approach (Sen; Nussbaum):** Evaluates whether digital educational environments expand or constrain a learner's substantive freedoms to achieve meaningful educational outcomes.

3.0 METHODOLOGY

3.1 Methodological Approach

This study utilizes a theory-building, qualitative documentary research design. The methodology focuses on conceptual synthesis, theoretical integration, and structural framework development rather than statistical generalization.



3.2 Evidence Base

The evidence base relies on peer-reviewed literature, policy frameworks, and empirical studies spanning platformization, datafication, learning analytics, educational AI, digital divide dynamics, and educational governance across both Global North and Global South contexts (e.g., OECD, 2026; Sembiring, 2026; Van den Berg, 2026; Williamson et al., 2020).

3.3 Analytical Procedure

The theoretical construction of the DEE framework followed four primary steps:

1. **Identification:** Comprehensive mapping of theoretical and empirical scholarship addressing power, data collection, platform business models, and learner agency in digital education.

2. **Categorization:** Classifying empirical findings into distinct exploitation vectors (financial, temporal, informational, academic, behavioral, attentional).
3. **Synthesis:** Cross-analyzing structural conflicts between platform profitability, institutional efficiency, and student rights.
4. **Model Integration:** Synthesizing these analytical categories into the conceptual DEE Model to illustrate how digital participation converts into structural exploitation.

4.0 FINDINGS AND DISCUSSION

4.1 Overview

The theoretical synthesis indicates that Digital Exploitation in E-Learning is not caused by isolated technological failures. Rather, DEE emerges through structural interactions between platform architectures, institutional policies, data extraction mechanisms, and suppressed learner agency.

4.2 Finding One: Access Does Not Equal Agency

Providing learners with digital access does not automatically confer control or autonomy. Meaningful ownership of learning requires self-determination, technological transparency, and the capacity to configure one's educational pathway (Sembiring, 2026, p. 649). When access is contingent upon accepting opaque terms of service, invasive tracking, or commercial data extraction, inclusion becomes a mechanism of institutional compliance rather than personal empowerment.

4.3 Finding Two: Platformization Mandates Dependency

As institutions outsource core pedagogical operations to commercial platforms, learners face compulsory technological dependency. The analytical distinction is vital:

$$\text{Standard Platform Use} \neq \text{Digital Exploitation}$$

$$\text{Mandatory Dependency} + \text{Power Asymmetry} + \text{Uncompensated Extraction} + \text{Constrained Agency} = \text{DEE}$$

4.4 Finding Three: Datafication Converts Participation into Capital

Under datafied e-learning regimes, standard learning activities are continuously recorded, aggregated, and monetized. This structural shift redefines the learner from a recipient of instruction into an uncompensated producer of valuable behavioral and academic data.

4.5 Finding Four: AI Dualism – Capability Enhancement vs. Cognitive Dependency

Generative AI and automated instructional systems present a dual dynamic. While AI tools can support personalized learning and academic productivity, uncritical adoption poses significant risks. Overreliance on AI can displace critical cognitive processing (OECD, 2026), reinforce algorithmic biases, and expose learner inputs to unauthorized model training without consent (Sembiring, 2026; Van den Berg, 2026).

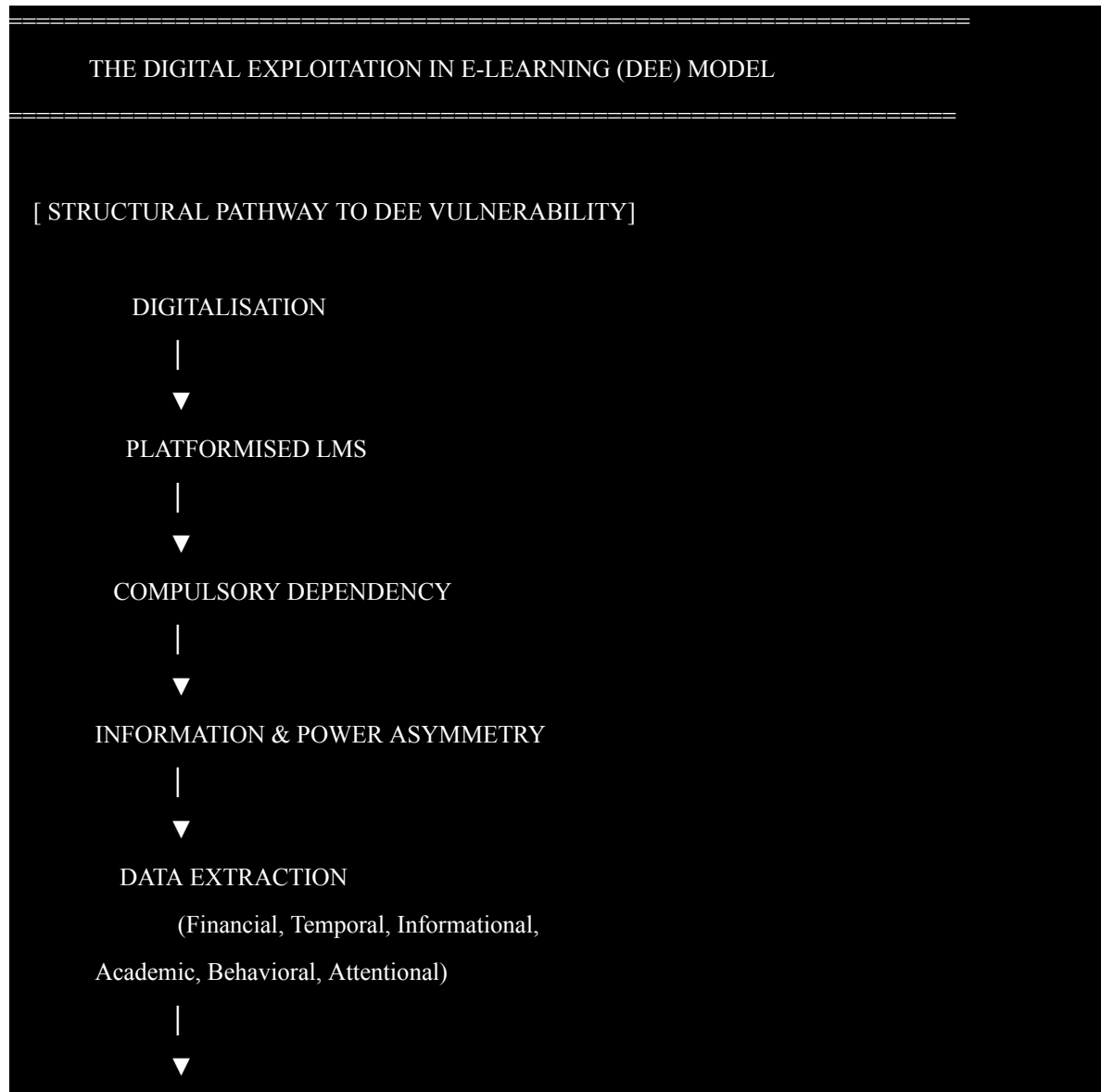
4.6 Finding Five: Global South Vulnerabilities Amplify Exploitative Risk

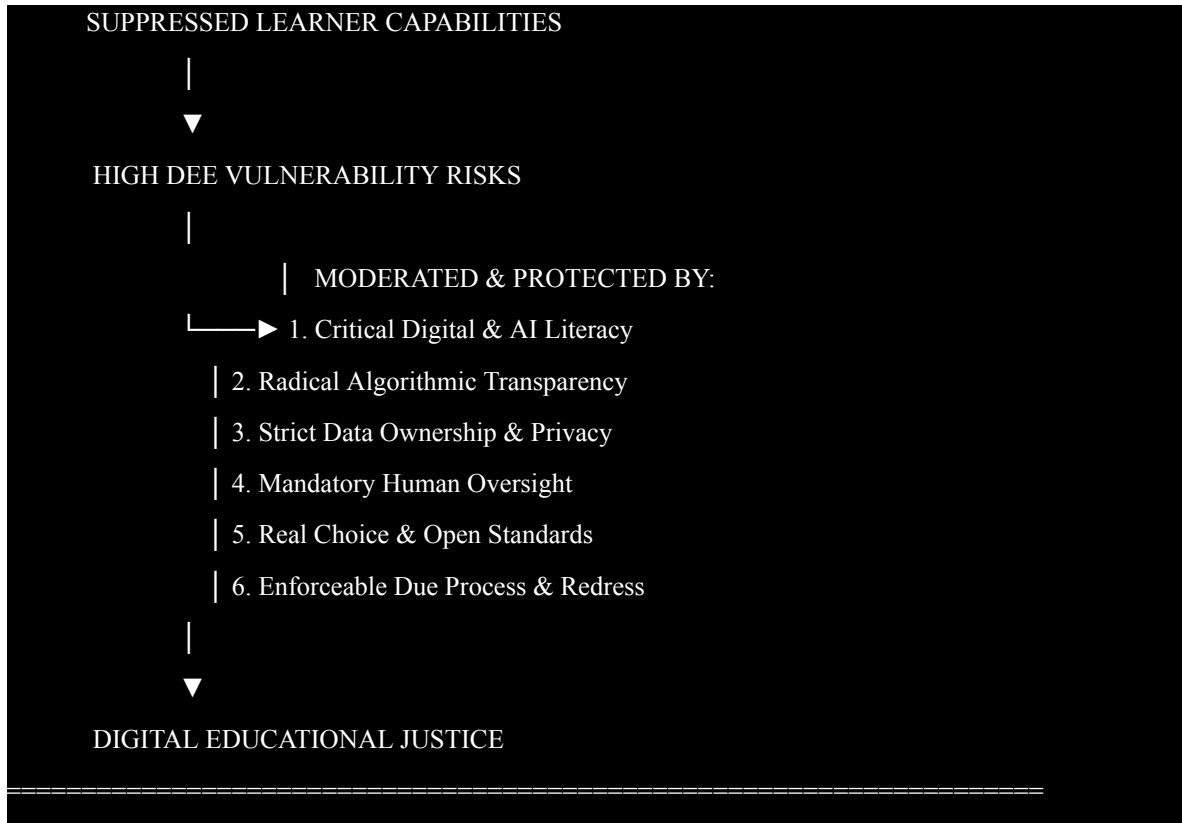
Systemic inequalities in infrastructure, digital literacy, and regulatory enforcement make learners in Global South contexts particularly vulnerable to DEE. Evidence from South African distance education demonstrates that where options are constrained, students are frequently forced to accept sub-optimal digital environments with weak data privacy protections and minimal channels for governance or redress (Van den Berg, 2026, pp. 807–808).

5.0 THE DEE MODEL

5.1 Model Architecture

The conceptual model presented below illustrates the theoretical pathway through which digital education systems can become exploitative, detailing both the structural drivers of vulnerability and the protective moderators necessary to realize Digital Educational Justice.





5.2 Mechanics of the Model

The originality of the DEE Model lies in mapping the structural transformation of digital educational participation into systemic value extraction. Unmoderated digitalization leads to platform lock-in, which deepens information asymmetries between platform providers and learners. This asymmetry enables multi-dimensional value extraction (financial, temporal, informational, academic, behavioral, attentional). Without protective institutional moderators, this pipeline degrades student agency. Conversely, implementing the six protective moderators transforms exploitative environments into frameworks of **Digital Educational Justice**.

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study demonstrates that digital educational environments must be evaluated beyond technological access, adoption rates, and instructional efficiency. The primary focus must center on the distribution of power, data ownership, extracted value, procedural choice, and human capabilities. Digital exploitation in e-learning emerges when compulsory platform dependency intersects with systemic information asymmetries, continuous datafication, uncompensated value extraction, and suppressed learner agency. Addressing this challenge requires moving beyond techno-solutionism toward structural models grounded in Digital Educational Justice.

6.2 Policy Implications

Educational regulators, accreditation boards, and policymakers should mandate:

- Full transparency regarding data collection, storage, third-party sharing, and retention schedules;
- Explicit disclosure of algorithmic decision-making architectures and AI deployment in grading or evaluation;
- Enforceable restrictions preventing commercial monetization of student data and creative work; and
- Mandated alignment with international ethical standards for AI and data governance (OECD, 2026; UNESCO, 2023).

6.3 Institutional Recommendations

Higher education institutions should operationalize the following safeguards:

1. **Platform Audits:** Conduct comprehensive digital accountability and privacy impact audits on all third-party software vendors.
2. **Prevent Vendor Lock-in:** Adopt open-source LMS frameworks and open educational standards to preserve institutional autonomy.
3. **Data Sovereignty:** Ensure that learners retain full ownership of their intellectual property, academic submissions, and behavioral telemetry.
4. **Human-in-the-Loop Oversight:** Establish mandatory human review for all high-stakes automated academic assessments.
5. **Redress Mechanisms:** Create clear institutional channels for students to appeal automated decisions and opt out of non-essential data tracking.

6.4 Recommendations for Future Research

Future research should focus on operationalizing and empirically validating the DEE Model through quantitative and mixed-methods research:

- **Empirical Validation:** Develop psychometric scales to measure perceived platform dependency, informational asymmetry, and learner data awareness.
- **Index Construction:** Operationalize the framework into a standardized **Digital Exploitation in E-Learning Index (DEE-I)** to benchmark educational institutions and platforms.
- **Longitudinal Impact Studies:** Investigate the long-term cognitive and agency impacts of AI-driven educational software across diverse socioeconomic demographics.

6.5 Final Contribution

This article's core conceptual contribution is that digital exploitation in e-learning is not merely a problem of technology costs or access deficits; it is a problem of power and value distribution within digitally mediated educational relationships.

The critical inquiry for future educational technology research must shift from asking "Does technology improve learning?" to asking: "Who controls the educational

technology, what value is generated through learner participation, who captures that value, and what capabilities do learners retain to understand, negotiate, and challenge these processes?" That inquiry defines the foundation of Digital Educational Justice.

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