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An Activity Theory Analysis of Artificial Intelligence Use in Postgraduate Thesis Writing in Morocco and the United Arab Emirates

Hasna Syakh

h.syakh@lancaster.ac.uk

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Abstract

Within contemporary Technology-Enhanced Learning literature, growing attention is paid to Artificial Intelligence (AI) in postgraduate research. While current studies document student perceptions and practical uses, there remains a critical gap in understanding how these tools restructure the systemic, socio-cultural dynamics of doctoral writing. This study adopts a Cultural-Historical Activity Theory (CHAT) framework to examine how institutional contexts, academic communities, and the division of labor between student and technology shape postgraduate decisions regarding AI use in thesis production. Utilizing a mixed-methods approach, data were collected from postgraduate participants across Morocco and the UAE, encompassing 33 quantitative questionnaire responses and two qualitative semi-structured interviews. The questionnaire identified students' aims for using or avoiding AI and the main contradictions they experience, while the interviews explored these issues deeper within the wider academic activity system. By reframing AI as a mediating artifact rather than an individual choice, this study contributes a nuanced socio-cultural perspective to the literature on academic literacies. Ultimately, these insights advance theoretical understandings of human-technology collaboration and inform more realistic, ethically grounded institutional policies and academic guidance regarding AI integration in higher education.

1. Introduction

Embarking on a research journey has traditionally been understood as an individual cognitive process, but in the current era of rapid technological advancement, the rise of artificial intelligence (AI) is fundamentally reconfiguring thesis writing and knowledge construction. Being a doctoral researcher in this period presents both opportunities and challenges; tools now support text generation, literature synthesis, and data analysis, enhancing research efficiency (Bates et al., 2020; Luo & Ma, 2023). However, framing AI primarily as a neutral tool for optimization oversimplifies its role. Instead, its integration creates a highly tense context where postgraduate students must navigate competing demands between efficiency and learning, assistance and authorship, and innovation and academic integrity (Liu et al., 2025).

Current research on these issues has emphasized approaches such as **[A]** functional tool adoption, academic integrity anxieties, and general student acceptance models. The arguments in the literature are largely that **[B]** AI acts either as a disruptive risk to critical thinking or as a powerful epistemic resource for productivity, although there are some disagreements about **[C]** what constitutes legitimate authorship versus unauthorized assistance and how institutional policies should regulate these practices. Some shortcomings in the current literature, in my view, are **[D]** a tendency to treat AI use as an isolated, individual choice or a purely technical skill, thereby overlooking how these practices are fundamentally embedded within complex social, regulatory, and institutional structures. This paper investigates **[E]** how postgraduate students systemically negotiate and experience GenAI as a mediating artifact within their thesis writing activity, which tries to address some of those shortcomings.

My motivation to address this specific research problem stems from both theoretical necessity and positioning. As a doctoral researcher, my own engagement with academic writing has made visible the deep complexities and ambiguities surrounding AI use, prompting a recognition that higher education policies are often written in a vacuum without understanding the actual, systemic contradictions students face. Traditional, individualistic research frameworks cannot capture the friction between institutional rules and the shifting division of labor between student and technology. Therefore, this study deliberately draws on Cultural-Historical Activity Theory (CHAT) to map this network, providing a necessary framework to analyze AI use not as a personal decision but as a socially contextualized practice influenced by communities, regulations, and tool mediation.

Furthermore, the urgency of this study is underscored by its distinct geographical scope, drawing empirical data from postgraduate participants in Morocco and the United Arab Emirates. These two contexts offer a compelling point of contrast due to their differing national policies and institutional frameworks regarding artificial intelligence in higher education. By investigating these specific regions through a CHAT lens, this paper addresses a critical empirical gap, introduces a new geographical dimension to the global conversation on AI-mediated research, and aims to move the literature beyond simplistic narratives of technological enhancement toward a critical examination of its implications for knowledge production.

By investigating these specific regions through a CHAT lens, this paper addresses a critical empirical gap, valorizes the firsthand voices of participants from these regions regarding AI use in thesis writing, and introduces a new geographical dimension to the global conversation on AI-mediated research.

To systematically explore these dynamics, this study is guided by three interconnected research questions designed to operationalize CHAT across the entire research design. First, to understand student motivations, the study asks, "How **do postgraduate students conceptualize the object of thesis writing and research when engaging with AI tools?"** Second, to map the structural influences on these practices, the study investigates the following: **How do institutional rules, academic communities, and the division of labor shape the AI-mediated activity system of postgraduate research in Morocco and the UAE?** Finally, to uncover the systemic friction driving change, the study addresses: **What systemic contradictions and tensions emerge within the postgraduate research activity system as a result of integrating GenAI as a mediating artifact?**

Focusing specifically on these three dimensions allows the study to move beyond superficial accounts of tool acceptance. By investigating the *object* of the activity, the *structure* of the system, and the internal *contradictions* within it, this research offers a theoretically unified diagnostic tool. This approach is necessary to capture not just what AI tools are being used but how their introduction fundamentally transforms the socio-cultural fabric of knowledge production in higher education.

2. Literature Review

To ground this study, a systematic search was conducted across the Lancaster University Library and Google Scholar databases using search strings combining "generative AI," "postgraduate research," "thesis writing," and "mediated activity." Managed via Zotero for thematic filtering, this process yielded a deliberate sample of 24 peer-reviewed empirical papers published between 2023 and 2026. The review prioritizes postgraduate and doctoral contexts over undergraduate writing, focusing on two core bodies of literature: Academic Literacies/Doctoral Composition and Technology-Enhanced Learning (TEL) frameworks. These areas were selected for their capacity to address the systemic nature of thesis production and institutional power dynamics. Conversely, purely cognitive technology-acceptance or ethical-compliance literature was excluded, as it reduces AI use to an isolated individual choice, thereby obscuring the socio-cultural complexities this study investigates.

2.1. AI in Academic Writing: Efficiency and Cognitive Transformation

The contemporary scholarship on generative AI (GenAI) integration in higher education tends to emphasize the dualism between technical optimization and cognitive disruption. Within this body of literature, a prominent strand of argument asserts that AI acts primarily as an epistemic accelerator that drastically streamlines literature syntheses, structures drafts, and enhances data visualization capability (Jadán-Guerrero et al., 2024; M. Liu et al., 2024; Wu et al., 2024). Conversely, a competing faction of researchers expresses deep anxieties regarding the erosion of critical cognitive engagement, warning against an "illusion of competence" where automated text generation masks a deficiency in deep disciplinary understanding (O'Leary, 2023; Wan et al., 2025).

To reconcile this tension, recent theoretical developments advocate for Human-Centered AI (HCAI) and Intelligence Augmentation (IA) paradigms, suggesting that AI-generated feedback can function as a cultural tool that scaffolds, rather than substitutes, human intellectual effort (Engeness, 2025; Mørch & Andersen, 2023). Moving toward 2026, the scholarship increasingly conceptualizes GenAI as a collaborative research partner (Zhu & Yang, 2026). However, researchers note that transitioning from basic tool use to true cognitive enhancement requires cultivating critical thinking and research self-efficacy as vital mediators to navigate the emotional isolation and stress of thesis work (Hu et al., 2025; Li et al., 2025; Ofem et al., 2024; Rolf, 2025; Singh et al., 2025). What is important for the present work is that this discourse remains heavily polarized between pure optimization and absolute risk, largely failing to investigate how these cognitive transformations are structurally conditioned by institutional rules.

2.2. AI in the Dissertation Process: Redefining Research Craft Skills

A critical theme emerging within contemporary doctoral composition literature is the impact of automation on traditional **research craft skills**. The key points emphasized across recent studies are that manual literature searching, iterative drafting, and interpretive sense-making are not merely mechanical tasks but essential thresholds through which postgraduate students internalize disciplinary knowledge

and develop an authentic scholarly voice (Kim et al., 2025; Nguyen et al., 2024; Storey, 2023). While scholarship demonstrates that GenAI effectively mitigates structural obstacles like writer's block during high-pressure dissertation phases (Nguyen et al., 2024; Storey, 2023), it simultaneously highlights that algorithms cannot substitute for human critical inquiry (Storey, 2023).

What seems profoundly lacking in the current literature is a holistic emphasis on how these craft skills are preserved or restructured when AI shifts from an occasional assistant to a continuous co-author. Existing studies tend to isolate specific chapters or technical data analysis tasks rather than examining the systemic, holistic trajectory of the dissertation (Kim et al., 2025; Nguyen et al., 2024). Furthermore, by focusing strictly on the student's output, the literature obscures how AI integration fundamentally alters the student-mentor relationship, supervisory expectations, and the transparent competencies required for evolving, practice-based capstones (Storey, 2023). This study draws directly from this gap, focusing on how "craft" is redefined when the primary task becomes the coordination of automated tools rather than manual text production.

2.3. Student Perspectives: The "Trust but Verify" Paradigm

Empirical investigations into postgraduate experiences reveal a distinct disconnect between institutional anxieties and actual student practices. Rather than utilizing GenAI as a cognitive substitute, current research shows that PhD candidates predominantly adopt a pragmatic "trust but verify" attitude, utilizing platforms like ChatGPT to surmount language barriers, refine form, and alleviate writing-related stress while maintaining skepticism toward AI accuracy, hallucinations, and citation handling (Rababah et al., 2024; Ratih & Kastuhandani, 2024).

However, this pragmatic deployment engenders a fundamental conflict between the researcher's emerging scholarly identity and technological convenience. While institutional guidelines often advocate for rigid, bounded restrictions, student experiences show that technologies are being utilized as comprehensive emotional and cognitive safeguards (Ratih & Kastuhandani, 2024). This divergence reveals a significant shortcoming in the literature: a tendency to report factually on student acceptance or disapproval while failing to map the underlying institutional contradictions that force students to continuously negotiate the boundary between legitimate assistance and independent authorship.

2.4. Ethical Landscapes and Institutional Contradictions

The ethical discourse surrounding AI in postgraduate research extends beyond simple plagiarism to broader questions of academic honesty, algorithmic bias, and negligent research practices (UNESCO, 2024). Because large language models cannot assume ethical responsibility, the scholarship emphasizes that the human researcher must maintain complete accountability for the final output to preserve intellectual depth (O'Leary, 2023). This creates an ambiguous, tense landscape for students navigating unaligned disciplinary expectations and superficial policy frameworks.

2.5. Synthesis and Research Gaps

In summary, this literature review exposes three critical shortcomings in the current scholarship:

1. A lack of research on how AI alters the ultimate motive or object of thesis writing.
2. A tendency to isolate technical tasks, thereby overlooking the wider sociocultural activity system (including supervisors, institutional rules, and cross-cultural variations).
3. A descriptive focus on practical challenges rather than the systemic contradictions driving these tensions.

It is precisely in response to these structural critiques that this study's research questions are formulated. By asking how students conceptualize the *object* of research (RQ1), how institutional *systems* in Morocco and the UAE shape their choices (RQ2), and what systemic *contradictions* emerge within the activity network (RQ3), this project directly addresses the fragmented nature of current scholarship. Utilizing CHAT as an overarching framework allows this study to convert these identified literary shortcomings into an empirical diagnostic tool, thereby contributing a unified, context-sensitive socio-cultural perspective back to the fields of academic literacies and technology-enhanced learning.

3. Theoretical Framework: Cultural-Historical Activity Theory (CHAT)

3.1. Ontological, Epistemological, and Theoretical Positioning

Grounded in a relativist and socio-cultural framework, this study views reality as socially constructed and knowledge as inherently shaped by social contexts. To operationalize these commitments, the research examines postgraduate students' experiences of AI integration in thesis composition through Cultural-Historical Activity Theory (CHAT). Rooted in Vygotsky's (1933) paradigm of tool-mediated learning, CHAT conceptualizes development as a socially and historically situated process rather than an isolated individual endeavor (Engeström, 2001).

Rather than relying on individualistic technology acceptance models, the selection of CHAT is explicitly justified along three dimensions identified by Bligh and Flood (2017) regarding its specific value in higher education research:

- **Systemic Mapping of Context**: It provides an analytical architecture that links micro-level student choices to macro-level institutional structures.
- **Centrality of Contradictions**: It treats systemic friction, misalignments, and tensions not as operational failures but as the primary historical drivers of structural change and developmental learning.
- **Reframing the Unit of Analysis**: It shifts the investigative lens away from the isolated user or tool, establishing the collectively produced, tool-mediated activity system itself as the core unit of analysis (Bligh & Flood, 2017, p. 138).

3.2. Distinguishing Key Theoretical Strands

To maintain doctoral-level rigor, a sharp technical distinction must be maintained between the broader philosophical scope of activity theory and the localized analytical architecture of the *Activity System Model*:

- **Activity Theory (Philosophical Framework)**: Posits that human consciousness is driven by collective practices. It maintains a strict technical distinction between a long-term, collective action activity driven by an object-oriented motive (e.g., degree completion) and a short-term, conscious Action directed toward an immediate goal (e.g., using an AI tool to generate an outline). Individual student actions only derive meaning when situated within the broader activity system.
- **The Activity System Model (Analytical Tool)**: Operationalized by Engeström (1987), this model serves as a structural map to isolate and visualize the internal anatomy of a single activity, examining how its constituent components interact, collide, and evolve.

3.3. Operational Concepts and Definitions

The key concepts from Engeström's (1987) structural model used to analyze the empirical data are defined below:

- **Subject**: The individuals whose agency and perspectives serve as the analytical viewpoint of the study (the postgraduate student).
- **Object**: The problem space at which the activity is directed, which is transformed into an outcome through tool-mediation (the thesis production).
- **Mediating Artifacts (Tools)**: The physical instruments, digital technologies (GenAI platforms), or signs (writing strategies) that subjects employ to alter the object (Lei, 2008, 2016).
- **Rules**: The explicit regulations, institutional policies, implicit conventions, and social norms that constrain and legitimize actions within the system.
- **Community**: The social group of actors who share a common stake in the overarching object (supervisors, examiners, peers).
- **Division of Labor**: The horizontal allocation of tasks and vertical distribution of power among participants in the system (student autonomy versus machine labor or institutional authority).
- *Contradictions*: The structurally rooted, historically accumulated misalignments or tensions that manifest within or between the structural nodes of an activity system.

3.4. Systemic Contradictions as Catalysts for Change

Integrating novel elements like GenAI triggers systemic disturbances (Miles, 2020). CHAT classifies these into four hierarchical tiers of contradictions:

1. **Primary Contradictions**: Internal conflicts within a single node, such as the dual nature of AI as an efficiency tool versus a threat to independent learning.
2. **Secondary Contradictions**: Friction emerging between two distinct components, such as a student utilizing advanced tools (*Artifact*) in direct violation of rigid university guidelines (*Rules*).
3. **Tertiary Contradictions**: Tensions appear when an innovative model of an activity supersedes traditional practices, creating a struggle between old methodologies (manual composition) and new ones (AI co-authoring).
4. **Quaternary Contradictions**: Misalignments between the primary activity system and external, neighboring systems, exemplified by a clash between a student's research trajectory and external requirements of professional certification bodies.

Navigating these four tiers of systemic tension is a fundamental requirement for subjects to achieve developmental progress (Truong, 2024). However, developmental progress stagnates when individuals attempt to resolve systemic issues in isolation (Engeström, 2001; Murphy & Rodríguez-Manzanares, 2008). Meaningful growth requires social cooperation within a community of practice (Lave & Wenger, 1991), which can trigger "expansive learning"—a bottom-up trajectory where a community collectively re-envisions and reorganizes its shared environment to resolve the identified contradictions (Miles, 2020).

3.5. Role of the Framework in the Project Lifecycle

CHAT is explicitly embedded across the entire lifecycle of this project:

- **Conceptualization Phase**: The framework directly dictated the formulation of the research questions, ensuring they systematically targeted the object (RQ1), the structural nodes of the activity system (RQ2), and the emerging systemic contradictions (RQ3).
- **Data Collection Phase**: CHAT informed the precise architecture of the empirical instruments. The items in the online questionnaire and the prompts within the semi-structured interview protocol were explicitly mapped to capture students' perceptions of institutional rules, the role of their academic communities, and the shifting division of labor between student and technology.
- **Data Analysis Phase**: The four tiers of contradictions serve as the primary diagnostic lens through which the empirical findings are categorized. This allows the study to move beyond merely reporting what students think, using the framework to explain the root systemic causes behind their experiences and to offer a transformative, socio-culturally grounded intervention into higher education policy.

4. Methodology

4.1. Research Design Rationale

To gain an in-depth, multi-layered understanding of the research problem, this study was carried out using a convergent parallel mixed-methods design (Creswell & Creswell, 2017; Morse, 1991). This design is uniquely appropriate to address this study's research questions because it allows for a comprehensive

diagnostic of the postgraduate activity system. While mapping the broad structural configurations of this system (RQ1 and RQ2) benefits significantly from the expansive, descriptive reach of quantitative questionnaire metrics, capturing the hidden, systemic contradictions and deeply negotiated experiences within that system (RQ3) requires the granular, lived narratives obtained through qualitative interviews.

A convergent parallel design entails that the researcher concurrently conducts the quantitative and qualitative elements in the same phase of the research process, weighs the methods equally, analyzes the two components independently, and interprets the results together (Creswell & Pablo-Clark, 2011).

In alignment with this parallel design, the initial analytical stage kept the two datasets completely separate. This independent approach purposefully insulated each dataset from premature influence or bias, preserving the distinct epistemic validity of both the questionnaire metrics and the interview codes. During the final synthesis, these independent streams of data were integrated and interpreted together. This merged interpretation enabled the qualitative peer narratives to explain, enrich, and problematize the statistical frequencies, yielding a comprehensive account of the AI-mediated research activity system.

4.2. Target Population and Participant Recruitment

In order to investigate how changing digital tools reshape the socio-cultural fabric of higher education, the target population for this study was explicitly defined by three characteristics directly derived from our research objectives. I aimed to recruit individuals who were

1. Actively enrolled in postgraduate or doctoral research programs.
2. Currently engaged in the high-stakes, complex activity of thesis or dissertation production.
3. Navigating institutional environments with distinct national or regional AI policies and frameworks.

This specific population was targeted because they possess direct, lived experience of the structural friction between technological optimization and institutional regulations.

To access this population, I approached postgraduate departments and student networks across institutions in North Africa and the Middle East. From this broader target population, the sample I was actually able to recruit consisted of 33 survey participants (Fig. 2), with the majority of the sample naturally emerging from Morocco and the United Arab Emirates. These two contexts offer a compelling empirical point of contrast due to their differing national strategies and institutional frameworks regarding artificial intelligence in higher education.

From this survey sample, a smaller, purposive subsample was invited to participate in follow-up semi-structured interviews. While several participants expressed initial interest, a small subset of two participants was ultimately available to complete the interviews within the designated data collection timeframe.

4.3. Instrument Design and CHAT Alignment

The data collection instruments were designed from the ground up to actively operationalize the core constructs of Cultural-Historical Activity Theory (CHAT), ensuring that the data captured went beyond superficial opinions to document systemic relationships.

- **Likert-Style Item (MappingRules)**: To capture how explicit regulations shape student choices, participants rated their agreement on a 5-point scale with statements such as “My *institution’s guidelines on the use of Generative AI in thesis writing are clear and consistently applied.*"
- **Open-Ended Item (Mapping Division of Labor)**: To capture how agency is negotiated between the researcher and the technology, the survey included the prompt: *"Describe a specific instance where you felt using an AI tool altered your role as the primary author or creator of your thesis text."*

The follow-up semi-structured interview guide was systematically structured around CHAT’s nodes to explore these issues in deeper, qualitative detail. Rather than relying on rigid scripting, the interview protocol used flexible, open prompts to investigate the object of the students' writing, their interactions with the wider academic community (e.g., *"How has your supervisor's personal attitude toward AI influenced your transparency about using these tools?"*), and the underlying contradictions surfaced by the questionnaire.

Data collection was conducted in March 2026. Quantitative data were gathered via an online questionnaire hosted on Google Forms, which ensured participant anonymity and data confidentiality. While text-based guidelines emphasize rigorous, detached preparation for semi-structured interviews (Luo & Wildemuth, 2009), the interviews conducted for this study were more conversational and fluid. As a PhD candidate navigating identical academic milestones as the participants, my shared *insider status* fostered a strong peer-to-peer connection. This positionality mitigated traditional researcher-participant power dynamics, allowing for a highly transparent, 30-to-45-minute granular exploration of the hidden tensions driving their survey responses.

4.4. Integrated Data Analysis and Findings Architecture

The primary objective of the data analysis process was to systematically decode individual student experiences into a structured map of a collective activity system, revealing the root causes of academic friction (Engeström, 1987). In accordance with convergent parallel mixed-methods principles, the analysis followed two independent pathways before final integration (Creswell & Creswell, 2017):

- **Quantitative Pathway**: Descriptive statistics, including frequencies and percentages, were used to analyze the questionnaire data, establishing the structural prevalence of tool usage, student motives, and perceived institutional clarity.
- **Qualitative Pathway**: Following Braun and Clarke’s (2022) reflexive thematic analysis, the semi-structured interviews were transcribed and coded. Initial codes were generated deductively using CHAT elements as analytical bins (subject, *tools, rules, community, and division of labor)*, followed by

inductive analysis to locate systemic contradictions and potential transition points (Engeström, 2001).

This integrated synthesis directly allowed me to produce the findings section. By cross-referencing quantitative frequencies with coded qualitative narratives (Creswell & Creswell, 2017), broad behavioral trends were mapped directly against deep contextual explanations, structuring the findings into three cohesive thematic zones:

Table 1
The findings Structure

Findings Section	Core CHAT Focus	Corresponding RQ
Section 5.1: The Evolving Toolkit	Student goals, writing motives, and altered thesis outputs (*Object/Tools*).	**RQ1**(Object/Motive)
Section 5.2: The Subject as Auditor	Structural influences, institutional rules, and community relations (*Rules/Community*).	**RQ2** (System Nodes)
Section 5.3: Systemic Contradictions	Deep internal tensions and fractured divisions of labor (*Contradictions*).	**RQ3**(Contradictions)

5. Findings

This section presents the empirical findings of this study, mapping the socio-cultural dynamics of AI integration within the postgraduate research lifecycle. To provide an immediate overview of the text, the real-world components discovered during data collection are synthesized into a unified empirical model below (Fig. 3).

Rather than treating these nodes as static categories, the analysis follows a deliberate three-part progression based on our structural framework:

- **Section 5.1 (The Evolving Toolkit: From Search to Reasoning)**: Explores how technology is transforming from passive assistance into complex cognitive scaffolding.
- **Section 5.2 (The Subject: The Researcher as AI Auditor)**: Details how students actively redefine their roles, identities, and agency within institutional communities.
- **Section 5.3 (Systemic Contradictions and Tensions)**: Diagnoses the acute points of friction, ethical dilemmas, and fractured divisions of labor where these elements collide.

This sequencing is analytically necessary: one cannot logically evaluate the internal contradictions of a system (Section 5.3) without first establishing the specific capabilities of the tools introduced (Section 5.1) and how human actors position themselves in response to them (Section 5.2).

The Activity System:

Kuutti (1996) conceptualizes activity as purposeful engagement: motivated subjects act upon an object to transform it into a meaningful outcome. While the initial activity system framework was outlined prior to addressing the research questions, the final configuration of its elements was refined and confirmed following the data collection phase.

In this specific activity system (Fig. 3), the subject (the postgraduate student) is driven by the object of producing a high-quality academic thesis. This objective is pursued through mediating tools, which integrate traditional academic resources with emerging AI technologies. The stability and success of this system are governed by the rules and the community surrounding the researcher. The community encompasses supervisors, peers, and the broader institution, all of whom uphold and enforce the rules of academic integrity and disciplinary standards, and it is coordinated through a specific division of labor. While these tools collectively mediate the research process, the analysis of primary and secondary contradictions focuses exclusively on the student's perspective during tool engagement.

5.1. The Evolving Toolkit: From Search to Reasoning

The survey data indicate that GenAI tools have become normalized in the research workflow, evolving from basic search functions to sophisticated reasoning partners. Over 70% of respondents use AI tools at least weekly, with "Several times a week" being the most frequent response. While early academic tools focused primarily on citation, students are now using tools for high-level cognitive tasks. The most common tasks include brainstorming ideas and understanding complex theories. Data from interviews indicates a particular shift toward grounded tools like ScholarGPT and Google NotebookLM. The tools enable students to ground AI reasoning in specific, uploaded academic literature to reduce the possibility of hallucinations, basically establishing a **mediating cognitive artifact** for data synthesis, as several participants noted.

5.2. The Subject: The Researcher as AI Auditor

A key finding is the redefinition of the researcher's identity from a solo creator to an active auditor of AI-generated content. Rather than using these tools to bypass effort, students are emerging as quality controllers. This is reinforced by the fact that 81% (27/33) of survey respondents said they generally verify or fact-check AI outputs. This is stated in qualitative interviews as due diligence, when the researcher cross-references every AI claim manually against academic databases such as Google Scholar or ResearchGate to catch bogus responses. This shows that the work of a PhD has not necessarily reduced but has moved from text generation to critical verification and structural logic.

Following Kuutti (1996), it is essential to recognize that neighboring activities can exert influence that disrupts an activity system's internal equilibrium. Within Activity Theory, these internal or external tensions are considered fundamental to the system's evolution. Engeström (1987) posits that contradiction serves as a primary engine for learning and development; consequently, design research leverages these tensions to create systems that better serve diverse users. By identifying and analyzing

the primary and secondary contradictions in this study, the researcher aims to facilitate a deeper understanding of these systemic frictions and explore pathways for their redesign.

5.3. Systemic Contradictions and Tensions

The empirical data reveals that integrating generative AI into the postgraduate research pipeline does not merely change individual writing habits; instead, it introduces profound, structural friction across the entire activity system. Table 1 synthesizes these identified primary and secondary contradictions, mapping their nodes, the nature of their conflict, and the empirical evidence supporting them.

6. Discussion

The primary objective of this study was to examine how the integration of generative artificial intelligence (GenAI) structures the postgraduate research lifecycle within a tool-mediated environment. By operationalizing Cultural-Historical Activity Theory (CHAT) as an overarching diagnostic framework, this study moves beyond superficial descriptions of tool adoption to offer a systemic analysis of student practices. This chapter discusses how the empirical findings intervene in, expand, and problematize the two primary bodies of literature reviewed earlier: Academic Literacies/Doctoral Composition and Technology-Enhanced Learning (TEL) governance.

6.1. Reconceptualizing Doctoral Craft: The Emergence of the "AI Auditor"

The first major contribution of this study is a theoretical intervention into the literature on academic literacies and doctoral composition. I introduce the concept of the "auditor component of literary craft." By this term, I mean the socio-cultural process through which advanced researchers preserve their intellectual agency and scholarly voice not through manual text generation but through the rigorous, critical coordination, validation, and editing of algorithmic outputs.

The empirical foundation for this contribution is directly grounded in the Verification Paradox and the Workload Double Bind that surfaced in our data. The findings demonstrated that a majority of postgraduate participants continuously engage in intensive, manual verification labor to spot deep machine hallucinations, while a minority actively navigate an intense daily tension between automated efficiency and academic honesty.

This contribution directly advances and refines the threads of scholarship established by Storey (2023) and Ratih and Kastuhandani (2024). Storey (2023) maintained that automated tools are fundamentally incapable of substituting for the traditional research "craft skills" of synthesis, interpretive sense-making, and critical inquiry. Our empirical data supports this claim but extends it significantly: while GenAI handles language mechanics and structural drafting, it does not diminish student intellectual effort. Instead, the student’s labor shifts from the mechanical execution of text production to the higher-order cognitive task of critical evaluation.

This aligns with and provides quantitative backing to Ratih and Kastuhandani's (2024) qualitative observation that advanced students do not use AI as a cognitive substitute but rather enforce a strict "trust but verify" attitude. By showing that a majority of students operate as critical validators, this study counters the pervasive anxiety in the literature, exemplified by O'Leary (2023), that extensive AI integration inevitably breeds an "illusion of competence" or negligent research habits.

For researchers in doctoral education, this contribution is highly significant. It provides a tested, non-binary conceptual framework to move past polarized, outdated arguments over whether AI "helps or hurts" academic integrity. Instead, it proves to scholars that the definition of doctoral "craft" in the automated age must be expanded to explicitly include algorithmic auditing as a legitimate form of advanced cognitive synthesis.

6.2. The Governance Gap: Institutional Double Binds and Asymmetric Rules

The second major contribution of this study is an empirical extension to the Technology-Enhanced Learning (TEL) and institutional policy literature. I conceptualize this contribution as "Asymmetric Activity System Disequilibrium." This refers to the structural state wherein a system's mediating tools advance rapidly into reasoning partners, while the corresponding community standards and institutional rules remain rigidly static, forcing individual subjects into unsustainable operational double binds.

The empirical basis for this contribution arises from the severe policy disconnects documented in Punitive Policy Ambiguity and the Institutional Expectation Mismatch. The quantitative metrics revealed a stark systemic gap: while over 80% of postgraduate students utilize these tools on a weekly basis, only a minimal 20% find their university guidelines transparent. Furthermore, they report a profound mismatch between their actual practices and official institutional expectations, resulting in researchers shaping their writing behaviors out of an explicit fear of academic penalties.

This finding builds directly upon the institutional anxieties raised by Dwivedi et al. (2023) and the readiness models of Rababah et al. (2024). While Rababah et al. (2024) argued that students demonstrate a high readiness to adopt AI, our data shows that adoption has progressed far past mere readiness into deep, system-level dependence. Consequently, the lack of transparent policy frameworks documented here confirms the warning of Dwivedi et al. (2023) that an institutional policy vacuum creates an adversarial, fear-based research culture.

Our qualitative data (*Student 1* and *Student 2*) highlights that this systemic disequilibrium manifests as a severe barrier to inclusion. For non-native English speakers, the division of labor between student and technology is utilized to establish linguistic equity, yet blunt institutional rules fail to differentiate between essential linguistic support and actual academic misconduct. This creates a state of asymmetric surveillance, where students are forced to hide their innovative workflows from supervisors to maintain a façade of traditional text production.

For TEL researchers and institutional policymakers, this contribution is critically important. It demonstrates empirically that top-down, prohibitive rules or reliance on unreliable detection software (*Student 2*) do not halt AI usage; they merely drive it underground, fracturing the supervisor-mentor relationship. This contribution alerts university administrators that sustainable policy governance cannot be achieved through reactive policing. Instead, it provides a clear mandate to develop socio-culturally grounded, discipline-specific guidelines—such as evaluating researchers as information architects rather than text generators (Chen et al., 2024)—thereby aligning institutional rules with the real-world practices of contemporary higher education.

7. Conclusion

7.1. Reprise: Re-evaluating the Mediated Research Landscape

In the opening of this thesis, doctoral education was framed as a landscape undergoing a profound socio-technical transformation. Initial chapters highlighted an academic tension: while generative AI accelerates text production and literature synthesis, it introduces deep anxieties regarding compromised critical thinking, blurred authorship, and fractured institutional integrity norms. Traditional discourses have long polarized this phenomenon, reducing the debate to a binary choice between pure technological optimization or punitive restriction.

This study directly intervened in this discourse by moving past these superficial binaries to map the postgraduate research lifecycle as a tool-mediated activity system. By answering the three guiding research questions, this work demonstrates that completing a modern thesis is no longer an isolated cognitive act, but the result of a highly negotiated human-technology-institution triad. The empirical findings show that students are active, adaptive agents who continuously adjust their workflows—often adopting a pragmatic "trust but verify" stance—to navigate uneven institutional rules and silent policy environments across Morocco and the UAE.

By applying Cultural-Historical Activity Theory (CHAT), this project contributes a unified socio-cultural diagnostic lens to the fields of technology-enhanced learning and academic literacies. It moves the academic conversation forward by proving that the fundamental challenge in higher education is not the presence of the machine itself, but the widening structural disequilibrium between rapidly evolving reasoning tools and rigidly static institutional governance frameworks.

7.2. Critical Reflections and Methodological Limitations

A rigorous interpretation of these findings requires a self-critical reflection on the systemic limitations that impacted data production:

- **Superficiality of Standardized Metrics**: The quantitative strand relied on a self-reported online questionnaire. While this captured broad behavioral frequencies, closed-ended items naturally lack

the depth required to trace subtle ethical negotiations. The research would have benefited from face-to-face, interactive interviews combined with a "think-aloud" protocol during tool testing to objectively assess real-time verification labor rather than relying on retrospective accounts.

- **Scale and Scope of Participant Data**: The empirical foundation rests on a modest survey sample and a small sub-sample of two qualitative peer interviews. While this approach granted an intimate, insider perspective, the findings should be interpreted as a deep contextual diagnostic of specific cohorts within Morocco and the UAE rather than a universal representation of global doctoral programs.
- **Lack of Longitudinal and Viva-Outcome Tracking**: This study captures a static snapshot of the thesis-writing stage without tracking participants through to completion. Because final AI-assisted documents were not evaluated alongside supervisors' formal assessments, the ultimate academic consequences remain unknown—specifically, whether these participants successfully passed their Vivas or faced institutional pushback and explicit demands to reduce AI usage.
- **Actor Perspective Asymmetry**: This research prioritized student voices to address a clear gap in literature, creating an analytical asymmetry in the CHAT mapping. Because data was not collected directly from thesis supervisors or administrators, the *Community* and *Rules* nodes reflect how students *perceive* expectations rather than documenting the explicit rationale of policymakers.
- **Contradiction Level Restriction**: The analysis was strictly confined to mapping primary contradictions within the tool node (the Verification Paradox) and secondary contradictions between intersecting nodes (Policy Ambiguity). The study did not track the historical emergence of tertiary or quaternary contradictions, which only become visible over time as a modified activity system collides with neighboring practices or professional certification bodies.

7.3. The Key Takeaway: The Post-Textual Dissertation Paradigm

The essential takeaway of this research is that the traditional, text-centric definition of doctoral "craft skills" has been fundamentally decentralized. When automated tools can generate structured drafts and synthesize literature in minutes, advanced scholarship can no longer be measured by the unmediated mechanical production of prose.

Instead, postgraduate competence has evolved into an architectural task: the contemporary researcher acts as an AI Auditor, whose primary intellectual labor is spent managing the division of labor, navigating institutional policy voids, and executing rigorous verification strategies to defend the truth-value of their work. Therefore, institutional efforts to preserve integrity by banning the tool or deploying hidden, unreliable surveillance metrics are structurally unsustainable. They fracture the student-mentor relationship and create an adversarial culture of fear without halting tool dependence. Higher education must shift its paradigm from reactive policing to proactive, socio-culturally grounded pedagogical integration.

7.4. A Roadmap for Future Research

To build directly upon these structural insights, future research should follow three distinct pathways:

- **Multi-Voiced Cross-System Designs**: Future studies should expand the unit of analysis to examine intersecting activity systems concurrently by actively gathering data from thesis supervisors, university assessment boards, and ethics committees alongside student participants.
- **Longitudinal Skill Retention Inquiries**: There is an urgent need for longitudinal research designs that track postgraduate cohorts over a three-to-four-year period to evaluate the long-term impact of continuous AI-co-authorship on cognitive threshold development and potential deskilling.
- **The Tiered Access Digital Divide**: As advanced reasoning engines shift behind premium paywalls, future inquiries must critically investigate how unequal access to sophisticated, high-tier AI models versus free, hallucination-prone software structures unequal outcomes for students in developing research economies.

Declarations

Ethical approval

This study was approved by the Educational Research Ethics Committee, School of Social Sciences, Lancaster University (approval number: ED.S883-CH18-36806982), and was conducted in accordance with the British Educational Research Association (BERA) Ethical Guidelines for Educational Research. Informed consent was obtained from all participants prior to data collection.

Consent to participate

Informed consent to participate was obtained from all individual participants included in the study. Before taking part, participants were informed of the aims of the research, the voluntary nature of their participation, their right to withdraw, and the measures taken to ensure the anonymity and confidentiality of their data.

Consent to publish

Not applicable. This article does not contain any identifiable personal data, images or information relating to any individual participant; all data are reported in anonymised and aggregated form.

Competing interests

The author declares no competing interests.

Clinical trial number

Not applicable.

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Author Contribution

Hasna Syakh conceived and designed the study, collected and analyzed the data, and wrote the manuscript. Hasna Syakh reviewed and approved the final manuscript.

Acknowledgment:

Generative AI tools were employed during the drafting of this manuscript to enhance language precision, facilitate reference checking, and summarize source materials. The final version of this paper has been thoroughly audited and revised by the author to ensure all ideas and arguments accurately reflect the original research.

Data Availability

All data supporting the findings of this study are available within the paper and its Supplementary Information, and additional data can be provided by the corresponding author upon request.

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Table 2

Table 2 is available in the Supplementary Files section.

Figures

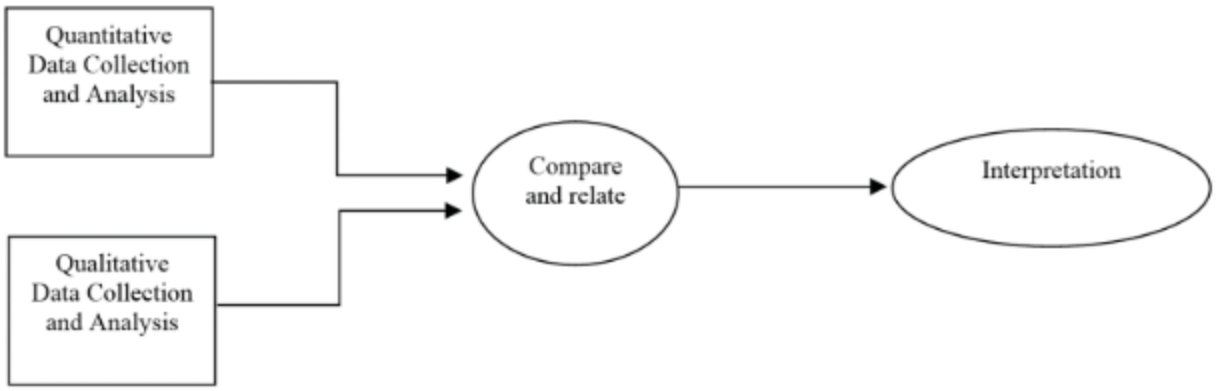


Figure 1

The integrated research process flow based on a convergent mixed-parallel design.

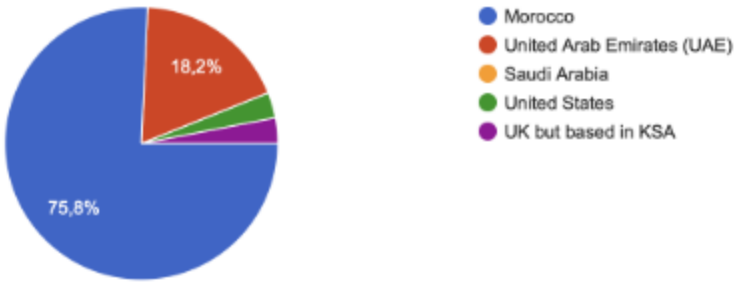


Figure 2

Geographic Distribution of Participants

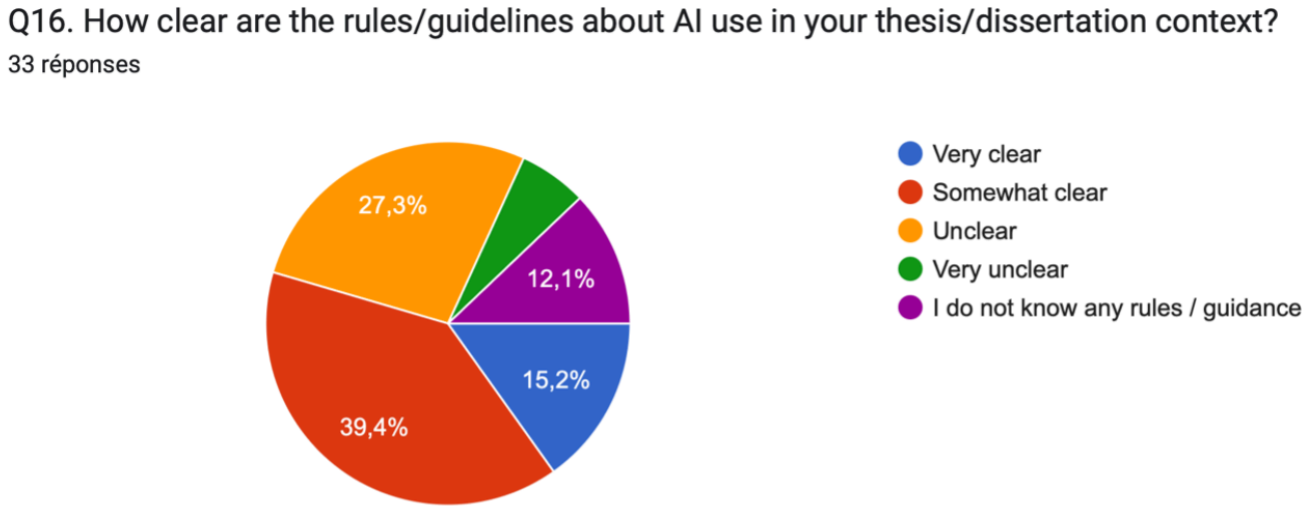


Figure 3

A Likert-Style Answer Example

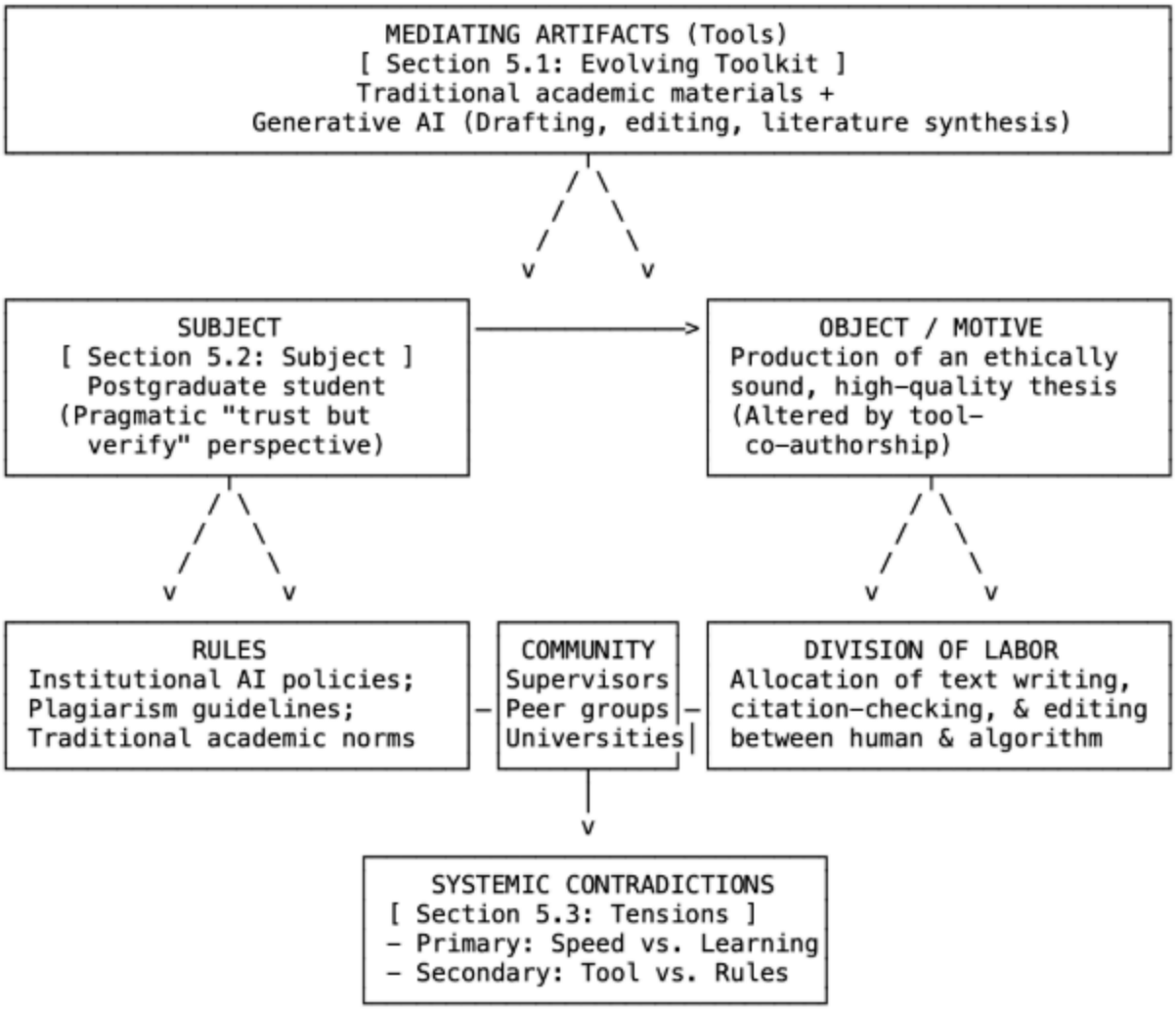


Figure 4

Empirical mapping of the postgraduate thesis writing activity system, highlighting the thematic focus of each upcoming section.

Supplementary Files

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- Table2.docx