



Mandatory AI Use as a Catalyst for Reflective Practice in Graphic Design Education

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Abstract

The growing presence of Artificial Intelligence (AI) in creative workflows has intensified debates around authorship, originality and learning in higher education. This paper critically reflects on an experience-based pedagogical intervention implemented in a Master's programme in Graphic Design, where the use of AI was made compulsory rather than restricted. Students were asked to design a personal self-promotion kit, combining printed artefacts and a digital portfolio, while maintaining a structured diary documenting their interaction with AI tools throughout the design process. Drawing on a qualitative analysis of students' reflective reports, process diaries and teaching observations, the study examines how enforced transparency and documentation influenced students' learning and design thinking. Rather than framing AI as a productivity tool or a threat to academic integrity, the intervention approached AI as an object of critical literacy within studio-based learning. Findings indicate that AI was predominantly used as a cognitive and organizational support for early-stage exploration, problem framing and technical facilitation, while its limitations, such as visual standardization, literal interpretations and weak material sensitivity, were consistently identified. The requirement to document iterations, failures and decision-making processes fostered reflective practice and slowed down otherwise accelerated workflows, reinforcing students' awareness of authorship and responsibility. Mandatory engagement with AI did not diminish creative agency; instead, it repositioned students as critical mediators who curate, evaluate and transform algorithmic outputs through human judgement. The paper argues that integrating AI within reflective, process-oriented pedagogical frameworks can strengthen critical thinking, ethical awareness and AI literacy in design education, offering a constructive alternative to prohibition-based responses to emerging creative technologies.

Keywords: Artificial Intelligence; Design education; Reflective practice; Design authorship; AI literacy

1. Introduction

The rapid normalisation of generative Artificial Intelligence (AI) in creative workflows has produced an unsettled debate within higher design education. On the one hand, design professionals increasingly describe AI tools as instruments of ideation, prototyping and acceleration; on the other, design educators face the difficult question of how to introduce these tools into curricula without either prohibiting them – and pushing their use underground – or naturalising them as a transparent productivity device. Both responses, in different ways, sidestep what is arguably the central pedagogical challenge: cultivating, in design students, a critical literacy in generative AI that treats it as an object of inquiry rather than as a tool of mere convenience.

The literature has begun to articulate this challenge but has only partially answered it. Recent scoping work [9] indicates that, while research on generative AI in design education has grown more than sixfold since the public release of ChatGPT in late 2022, the field remains methodologically nascent and theoretically thin: most studies do not specify measurable outcomes, employ no theoretical framework, and concentrate on a narrow geographic range. The same review identifies graphic design as a particularly under-researched sub-discipline. Within this emerging literature, Fleischmann's recent work [10, 12] proposes a structured curricular response to the integration of generative AI in design education and documents converging international practices – including the requirement that students submit “AI usage statements” alongside their work. Across these contributions, the curricular proposal is broadly consistent: AI literacy should be foregrounded, prompt engagement should be made visible through reflective documentation, and the designer's reconfigured role – as curator, mediator, decision-maker – should become an explicit object of teaching. What this literature does not yet provide is sustained empirical analysis of what such a structured curricular response produces when implemented and rigorously analysed.



This paper presents one such analysis. The empirical site is a Master's-level elective unit in Graphic Design, in which the use of generative AI was made compulsory rather than optional, and reflective documentation in the form of a weekly experimentation diary was made obligatory. Nine students developed a personal self-promotion kit articulating a printed component and a functional website, with AI integrated as an explicit support across all four phases of the design process. The corpus of technical-critical reports and process diaries produced by these students is here analysed through reflexive thematic analysis [4]. The aim is not to determine whether students benefited from AI, nor to measure the effect of AI on creativity, but to surface the patterns through which students articulated and made sense of mandatory engagement with AI within a structured pedagogical context.

The paper makes two contributions. First, it offers an empirical test of the structured curricular response that the literature has so far formulated chiefly at the level of proposal, documenting a set of findings that complicate the prevailing vocabulary of efficiency and threat. Second, it positions a Portuguese case within a sub-disciplinary and geographic gap – graphic design, Southern European higher education – that the most recent scoping review of the field [9] explicitly identifies as under-investigated. The remainder of the paper is organised as follows. Section 2 situates the work within the pedagogical traditions of design and the emerging literature on generative AI in higher education. Section 3 describes the pedagogical context and the assignment design. Section 4 articulates the methodological procedure and its ethical commitments. Section 5 presents the four themes that organise the findings. Section 6 discusses their implications, and Section 7 concludes by noting limitations and proposing directions for further inquiry.

2. Theoretical Framework

2.1 *Reflective Practice and Process-Oriented Learning in Design Education*

Design education has long understood itself as a discipline of practice rather than of declarative knowledge. The studio, identified by Shulman as one of the professions' signature pedagogies [15], is where students develop technical skill alongside professional judgement and the capacity to act under uncertainty. At the heart of this pedagogical model lies Schön's account of reflective practice [1] and its dual notions of reflection-in-action and reflection-on-action: the designer learns by acting, observing the consequences of action, and articulating the knowledge that emerges. Kolb's experiential learning cycle [2] provides a complementary structure, and Cross [3] adds that designers' problem-framing is constitutive rather than derivative – designers do not solve problems given in advance but construct the problem in the act of proposing solutions. Together, these frameworks justify the place of the journal, the diary or the process portfolio in design pedagogy: reflection becomes consequential only when it is rendered visible and traceable.

2.2 *Generative AI in Higher Design Education: An Emerging and Uneven Field*

The emergence of generative AI in higher education has produced an expanding but methodologically uneven literature. A recent scoping review by Musienko [9], drawing on 156 studies indexed in the Web of Science Core Collection between 2017 and 2026, documents a 6.4-fold increase in publication volume following the public release of ChatGPT in late 2022 while concluding that the field "remains theoretically underdeveloped and methodologically nascent". Among design sub-disciplines, graphic design is dramatically underrepresented, accounting for only 1.9% of the corpus, despite the centrality of image-generation tools in current AI discourse, and is explicitly identified as an under-researched discipline requiring focused investigation [9].

Within this emerging field, the work of Fleischmann offers the most sustained programme of inquiry into generative AI in design education. Two studies are particularly relevant: a survey of 74 design students at an Australian university [10] and qualitative interviews with nine design educators across El Salvador, Indonesia and Denmark [12]. The latter identifies three transversal themes: AI as a "thinking partner", the persistence of manual-first pedagogy as a cognitive anchor, and the rising importance of "prompt literacy" as a new professional competency. Across both studies, Fleischmann consistently argues that AI should be introduced into design curricula in a structured rather than *ad hoc* manner, and that reflective documentation of AI use should function as a metacognitive strategy rather than as a procedural requirement. However, neither study analyses the student-produced material that such a structured curricular response generates. The present paper is positioned within this gap.

The broader literature converges on a vocabulary that is internally consistent across institutional contexts. The designer is repeatedly described as moving from "maker" to "curator" or "director" of AI-

generated material [9, 12]. Bartlett and Camba [11] document, in product design education, concerns about originality and ethics that closely parallel those expressed in the graphic design context. Hwang and Wu [13], working with image-generation tools in a graphic design course, propose the figure of the “content creator” as a way of describing the designer’s reconfigured role. Lupetti et al. [14] add a further dimension, drawing attention to the environmental costs of generative AI in design education and arguing for a critical literacy that includes ecological reasoning. This last contribution is especially relevant because environmental concerns emerged spontaneously in the present study’s corpus, suggesting that the issue is not idiosyncratic but part of a wider critical horizon.

Two critical perspectives complete this framing. Selwyn [6] argues against the technosolutionist narratives that frame AI primarily as an efficiency device, urging a vocabulary of literacy, context and power. Bearman, Ryan and Ajjawi [7] map the discourses of AI in higher education and identify three dominant framings – efficiency, threat to academic integrity, and inevitable opportunity – none of which adequately captures the pedagogical question of how AI becomes an object of critical inquiry rather than a tool of production. Holmes, Bialik and Fadel [8] further frame AI literacy as a competency to be cultivated rather than a skill to be acquired. The present study is positioned within this critical orientation: it does not ask whether AI should be used in design education, nor whether students enjoy using it, but what happens, pedagogically, when its use is made compulsory and reflexively documented within a structured studio assignment.

3. Pedagogical Context and Assignment Design

The assignment that constitutes the empirical site of this study was designed and delivered within the unit *Design e Tecnologias*, an elective unit offered in the first semester of the first year of the Master’s degree in Graphic Design at the School of Applied Arts (ESART) of the Polytechnic Institute of Castelo Branco, Portugal, during the academic year 2025/26. The author was the unit’s Invited Assistant Professor at the time and is the sole designer and analyst of the intervention; the analysis presented in this paper was conducted after his transition to a full-time position at the University of Aveiro, Portugal, where it forms part of his current research activity at ID+. The cohort of nine students consisted of recently enrolled Master’s students who had self-selected into an elective unit explicitly framed around the intersection of design and emerging technologies, and were therefore at an early formative stage in the negotiation of their professional identity as designers while also having actively chosen a context in which engagement with technological tools was foregrounded.

The assignment, titled *Self-Promotion Kit – Design and AI*, was framed by the working assumption that the contemporary graphic designer must develop critical literacy in generative AI, understood neither as a productivity device nor as a threat to authorship, but as an object of design inquiry in its own right. Students were required to develop a personal self-promotion kit articulating two complementary components: a printed component, conceived at full scale and to professional production standards, and a functional website prolonging the same identity into the digital domain. The printed component could take the form of any combination of graphic supports – catalogue, brochure, poster, manifesto, or other formats – provided that it operated as a coherent expression of the student’s emerging identity as a designer. The choice to centre the assignment on a self-promotion kit, rather than a fictional client brief, was deliberate: artefact and subject coincide, since students design the visual identity through which they will represent themselves as designers entering the profession (see Section 6.2). AI was to be used as an explicit support throughout the four phases of the design process – Discover, Define, Develop and Deliver – and all interactions with AI tools were to be documented in a weekly process diary.

The pedagogical structure unfolded across eight sessions over a thirteen-week period, organised around four phases: an introductory session framing the question of authorship under AI; visual identity development and iterative production of printed prototypes (three sessions); development of two successive functional versions of the website (two sessions); refinement of digital interactivity (one session); and final in-class presentation (one session). Submission was made through the institutional learning management system on 12 January 2026.

Three features of the assignment are decisive for the analysis that follows. The first is the obligatory and transparent character of AI use: students were not permitted to opt out, nor were they permitted to use AI without documentation. This deliberately inverts the dominant pattern in higher education, where AI is either prohibited or tacitly tolerated, with the consequence that its use becomes either covert or unreflexive. The second feature is the compulsory diary, conceived not as a record of activity but as a metacognitive device intended to slow the production cycle, expose decision-making and render the iterative structure of the work traceable. The third feature is the dual material constraint: the requirement to produce both a printed artefact and a functional digital interface forced students to confront the



differential behaviour of generative AI across material domains, an opposition that emerged as analytically productive in the subsequent thematic analysis. The intervention therefore operationalises, in a specific national and disciplinary context, the structured curricular response that Fleischmann [10] argued for at the level of proposal, and articulates with the practices of “AI usage statements” and prompt justification that Fleischmann [12] documented internationally.

4. Methodology

This study employs a qualitative interpretive approach to examine the material produced by students during and after the assignment. The aim is not to measure the impact of generative AI on creativity through quantifiable indicators, but to surface the patterns through which students articulated, problematised and made sense of their interactions with AI within a structured pedagogical context. Given this aim, *reflexive thematic analysis* in the sense recently consolidated by Braun and Clarke [4, 5] was selected as the analytical method. The study is framed within an interpretivist orientation with a critical-constructionist inclination: themes are understood as analytical constructions produced by the researcher in iterative engagement with the corpus rather than as entities awaiting discovery in the data; meaning is taken to be situated and shaped by the researcher’s interpretive position; and heterogeneity within the corpus is treated as a property to be represented rather than as noise to be filtered.

4.1 Corpus

The corpus comprises the technical-critical reports and the experimentation diaries produced by the nine students enrolled in *Design e Tecnologias* during the academic year 2025/26. Reports range in length from approximately 1,500 to 9,000 words; diaries vary more widely, from short captioned visual logs to extended weekly written entries. The combined textual corpus, after extraction and cleaning, totals approximately 31,700 words. Visual material accompanying the submissions – printed pieces, screenshots, mockups, prompt outputs – was consulted as context but was not subject to systematic analysis, since the focus of the study is on the verbal articulation of the design process.

4.2 Ethical Procedure

The reports and diaries were originally produced as coursework for academic assessment, not as research data. To use this material for research purposes, individual informed consent was obtained from each of the nine students through retrospective contact by email. The consent request explained the scope and purpose of the publication, clarified that all citations would be anonymised through alphanumeric codes (S1 to S9), specified that no visual material would be reproduced, and offered the option to refuse without academic consequence. All nine students consented to the use of anonymised excerpts. Excerpts were reviewed to remove or generalise indirect identifiers that might enable re-identification.

4.3 Analytical Procedure

The analysis followed Braun and Clarke’s [4] six-phase reflexive procedure: familiarisation, inductive coding in a structured matrix preserving provenance, iterative aggregation into candidate themes, review against the corpus as a whole, consolidation, and writing-up. Internal variation within themes, including formulations that complicate or partially counter the dominant pattern, was retained rather than excluded.

4.4 Researcher Position and Limitations

The author is, simultaneously, designer, lecturer and analyst of the intervention. This concentration of roles has both an interpretive advantage – depth of contextual knowledge – and an analytical risk: confirmation bias. To mitigate this risk, theme names were not fixed in advance but constructed through iterative engagement with the material, and points at which the corpus diverges from the pedagogical intention were sought out and explicitly retained. Three further limitations should be acknowledged: sample size (nine students; the findings are not offered as generalisable); single-coder design; and the partially mediated nature of the textual corpus, since several students declared the use of AI tools in editing their reflective writing – a complication treated as itself part of the phenomenon under study.



5. Findings

The thematic analysis constructed four themes that organise the patterns observed across the corpus. The themes are presented in the order in which they structured the design process for the participating students, from initial encounter with AI tools to retrospective evaluation of the experience. Each theme names a dominant pattern; internal variations are retained within the analytical narrative rather than smoothed over.

5.1 AI as Cognitive Scaffold Rather Than Authorial Agent

Across the corpus, students consistently describe AI as a tool that supported the organisation of thought, the structuring of unclear ideas, and the accelerated exploration of conceptual and visual possibilities. AI is recurrently positioned as an aid to ideation, not as a producer of authorial decisions. The reflective vocabulary the students adopt – “organising the thinking”, “structuring”, “clarifying”, “accelerating exploration” – converges on a model of AI as cognitive scaffold rather than creative agent. S8 articulates this most directly, noting that the tool “acts as an instrument for organising thought, not for generating concepts”, while S4 describes how “AI was integrated as a support tool, not as an autonomous creative agent”. The convergence of formulation across distinct voices is itself part of the finding. This framing aligns with the wider literature on generative AI as a “thinking partner” [12], but it also reflects the deliberate framing of the assignment, which positioned AI explicitly as a support across the Discover, Define, Develop and Deliver phases. Depth of internalisation varied across the corpus: while several students articulate the framing with conceptual sophistication, others adopt the same vocabulary in a more functional register.

5.2 Friction, Slowing and the Productive Role of Documentation

Contrary to the dominant narrative of AI as a productivity accelerator, several participants reported that mandatory AI use slowed their work, generated frustration, and required iteration cycles that exceeded those of unaided practice. Under the conditions of obligatory documentation imposed by the assignment, this difficulty became available for reflection: the weekly diary forced students to translate the experience of misalignment between intention and output into language, and in doing so to make explicit the criteria, preferences and intentions that would otherwise have remained tacit. The dual finding – that mandatory engagement produces friction, and that obligatory documentation transforms friction into learning material – recurs across the corpus and stands as one of the central patterns of the analysis.

S4 articulates the experience of slowing directly: “I often spent more time on AI than producing from scratch”. S6 describes how “the difficulty hindered the creative process; it took time to understand how to use it”. The most quantitatively striking instance is S8, who reports that “about 29 versions of the website were generated; small prompt changes produced significant layout shifts” before concluding the work through a further iteration cycle of comparable magnitude. The pattern is consistent: mandatory AI use, far from removing struggle from the design process, introduced new forms of struggle – versioning loops, prompt reformulation, repeated rejection of generated material.

This pattern does not, however, operate uniformly. At least one student articulates a different relation to difficulty: S7 narrates initial trouble with AI tools but resolves it through a strategy of “maximum specificity in prompting” that effectively eliminates friction rather than transforming it into reflective material. This case is instructive precisely because it shows that the transition from difficulty to reflection is not automatic: a student may respond to friction by optimising it away rather than by documenting and interrogating it.

5.3 The Asymmetry Between Print and Digital

The dual material constraint of the assignment – printed component plus functional website – produced a recurrent and analytically productive asymmetry in the corpus. Students consistently report that AI was less effective in supporting decisions about the printed component, where considerations of scale, sequence, paper, binding and bodily interaction with the artefact required forms of judgement that the AI did not adequately scaffold. S4 puts this directly: “in the printed portfolio AI tended towards literal interpretations”. In contrast, AI was reported as significantly more useful in the digital component, where it lowered the technical threshold of website production, generated functional code or layouts, and operated within a domain whose conventions are more amenable to algorithmic manipulation. S4 again: “in the digital portfolio AI proved more effective as it facilitates more technical processes”.



The asymmetry surfaces a distinction that prevailing accounts of AI in design education have rarely articulated: AI's pedagogical effects are not uniform across material domains, and the materiality of the artefact mediates the cognitive contribution of the tool. For most students, the asymmetry is articulated pragmatically: AI is *more useful for the technical aspects of the website*. For S7, however, the same asymmetry is articulated through an ethical-environmental register: she used AI principally in the digital domain because doing so aligned with her own concern for energy efficiency in the design process. This second formulation extends the discussion of tacit knowledge in design practice [10] by suggesting that print and digital not only make different demands on tacit understanding but invite different normative framings of when and why AI engagement is justified.

5.4 Reconfiguration, Not Dissolution, of Authorship

Across the corpus, students articulate a consistent reframing of their role as designers, not as a loss of authorship in the face of automation, but as a redistribution of authorial activity. The students describe themselves as curators, editors, decision-makers, mediators between human intention and algorithmic output. S4 puts the reframing most concisely: *"the designer's role will evolve from executor to curator, editor and strategist"*. S1 echoes this in describing *"a transition from the role of craftsman to that of strategist and visual curator"*. This vocabulary is not imposed by the assignment; the brief uses the term "mediator", but the language of curation, editing and selection emerges in the reflective writing in formulations that are recognisably the students' own. The convergence of vocabulary across distinct individual trajectories, and across the international literature [9, 12, 13], suggests that the figure of the designer-as-curator is not a rhetorical commonplace but a substantive reorganisation of design practice that is being negotiated, in real time, by the practitioners themselves.

The reframing is not, however, articulated in a single register. S7 formulates the same shift in markedly more anxious terms, suggesting that *"the junior designer's future lies not in execution speed but in management capacity"* – a formulation that positions curatorship as a strategic response to perceived professional threat rather than as a serene reappropriation of authorial role.

A further dimension surfaces in two of the reports: a small but consistent articulation of environmental and ethical concerns about the use of AI, including its energy cost. S7 frames this most directly: *"the ethics of this project rests on ecological responsibility"*, complemented by her observation that *"the use of AI was guided by energy efficiency"*. S8 articulates a related concern: *"ethical reflection came to include awareness of the invisible costs of automated generation technologies"*. This articulation, which echoes recent critical work on the environmental impact of generative AI in design education [14], emerges as part of the same reconfiguration of authorship: to be a designer who works with AI is, for these students, also to be a designer who must take responsibility for the choice to do so. Supported by a minority of the corpus rather than by the majority, the articulation is an emerging minority position rather than a generalised pattern; its analytical significance lies less in its frequency than in its independent emergence, in two distinct voices, in formulations not solicited by the assignment.

6. Discussion

The four themes presented in Section 5 articulate, in the voices of the participating students, a set of patterns that the wider literature has identified at the level of proposal but rarely surfaced in the textured form that a structured pedagogical intervention permits. This section reads those themes against the literature, identifies points of convergence and tension, and discusses the implications of the present case for the wider field.

6.1 Confirmation, Extension and Tension with the Literature

The first theme – AI as cognitive scaffold rather than authorial agent – confirms a finding that has emerged repeatedly across recent studies, including Fleischmann's account of "AI as a thinking partner" [12] and the broader literature on prompt engagement as a metacognitive practice. The vocabulary the students adopt ("organising thought", "structuring", "clarifying") closely tracks the language documented in Australian, Danish, Indonesian and Salvadoran contexts [10, 12]. The convergence is striking precisely because the participating students did not have access to that literature; the formulation is one they reach independently, in negotiation with the assignment and with the tools themselves.

The second theme departs more clearly from the dominant narrative in the literature. Industrial accounts of generative AI consistently describe acceleration, speed and efficiency as its primary affordances [10]; even critical accounts that warn against uncritical adoption [12] do so by reference to AI's excess of

fluency rather than to its difficulty. The students in this corpus describe a more uncomfortable experience: AI, far from accelerating their work, often slowed it; far from removing struggle from the design process, it introduced new forms of struggle – versioning loops, prompt reformulation, repeated rejection of generated material. The pedagogical lesson is not that AI is slower than expected, but that mandatory engagement, when reflexively documented, transforms friction from an obstacle to a learning surface – though, as the findings have shown, not for all students and not always.

The third theme – the asymmetry between print and digital – articulates a finding that is largely absent from the existing literature, which has tended to treat AI's effects on design as if they were uniform across material domains. The students consistently report that AI was less effective in supporting decisions about the printed component, where considerations of scale, sequence, material and physical interaction with the artefact resisted the algorithmic vocabulary of the tools, and significantly more useful in the digital component, where AI lowered the technical threshold of website production. The asymmetry is analytically productive because it surfaces the role of materiality in mediating the cognitive contribution of AI: print and digital make different demands on the tacit understanding designers bring to AI engagement, and AI engages differently with each in consequence.

The fourth theme – reconfiguration, not dissolution, of authorship – converges with what the broader literature has begun to call the shift from “maker” to “curator” [9] or from “designer” to “director” [12]. The vocabulary of curation, mediation and decision-making is articulated by the participating students with notable consistency and in formulations that are recognisably their own rather than imposed by the assignment brief. The convergence is not uniform in register, however: while several students frame the shift as an expansion of authorial agency, at least one articulates the same reconfiguration in markedly more anxious terms, positioning curatorship as a defensive adaptation to perceived professional pressure. A subsidiary strand of this theme – the articulation of environmental and ethical concerns about AI use – deserves particular emphasis. Two students independently raise ecological responsibility as part of their design reasoning, in formulations not prompted by the assignment and aligned with recent critical work on the environmental costs of generative AI in design education [14]. The articulation is supported by a minority of the corpus rather than by the majority, and its analytical significance lies less in its frequency than in its independent emergence in distinct voices. That this concern emerges at all, framed as part of the designer's professional responsibility rather than as an external imposition, suggests that ethical literacy is being internalised as an integral dimension of authorship rather than as a separate compliance requirement – at least for some students.

6.2 The Artefact and the Subject

A pedagogical decision that warrants explicit discussion is the choice to centre the assignment on a self-promotion kit rather than on a fictional client brief. In conventional studio assignments, the artefact and the subject are kept separate: the student designs for an external party, and the rejection of mediocre output carries no personal cost. In the present case, the artefact and the subject coincide: the kit represents the student as a designer entering the profession. We hypothesise that this coincidence is one of the conditions that produced the patterns observed, particularly the systematic rejection of AI-generated material as “not me” reported across multiple cases. When the cost of accepting standardised output is the standardisation of one's own professional self-presentation, the threshold for acceptance rises. This is a hypothesis the present corpus cannot definitively test, but it is consistent with the data and worth marking as a conjecture for further inquiry. It also suggests a practical curricular implication: assignments in which AI use is mandatory may benefit from a high degree of personal investment in the artefact, as a pedagogical multiplier of reflective engagement.

6.3 Implications for the Field

Three implications follow for the wider field. First, the structured curricular response that the literature has been calling for [10] is implementable, produces analytically rich material, and can be defended ethically and methodologically when the appropriate procedural commitments are in place. Second, the dominant rhetoric of AI as a productivity device deserves complication: when AI use is mandatory and reflexively documented, friction and slowed engagement emerge as primary pedagogical resources. The three discourses mapped by Bearman, Ryan and Ajjawi [7] – efficiency, threat to academic integrity, inevitable opportunity – do not adequately capture this pedagogical possibility, and a fourth orientation, organised around critical literacy and structured reflection, deserves explicit articulation alongside them. Third, the development of AI literacy in design education appears to entail not the rejection of AI nor its



naturalisation, but its repositioning as an object of design inquiry – something the designer thinks *with* and *about*, rather than something the designer simply uses.

7. Conclusion

This paper has reported on a pedagogical intervention in which generative AI use was made compulsory within a Master's-level graphic design unit, and student engagement was rendered traceable through obligatory weekly diaries. The reflexive thematic analysis of the resulting corpus constructed four patterns: AI as cognitive scaffold rather than authorial agent; friction and slowed engagement as a counter-narrative to dominant accounts of AI as efficiency device; the asymmetry between AI's effects on print and digital components; and the reconfiguration, rather than dissolution, of authorial agency, including the articulation of environmental and ethical concerns. These patterns are dominant but not uniform: the corpus also includes more utilitarian engagements, anxious framings of the designer's reconfigured role, and at least one case in which friction was optimised away rather than transformed into reflection.

Two contributions follow. The first is empirical: the study offers a qualitative analysis of student-produced material from a structured intervention combining mandatory AI use with obligatory reflective documentation, complicating the prevailing vocabulary of efficiency and threat by documenting difficulty, slowed engagement and material asymmetry as outcomes. The second is positional: the study contributes a Portuguese case to a sub-disciplinary and geographic landscape mapped as significantly under-researched [9].

The limitations of the study are explicit. The sample is small and the corpus partially mediated; the analyst is also the educator, and the findings are presented as theoretically suggestive rather than as statistically generalisable. The pedagogical context is specific: an elective unit in a Portuguese polytechnic Master's programme, with a particular cohort and a particular brief. No claim is offered that the same patterns would emerge under different framings.

Three directions for further inquiry follow naturally from this work: replication across institutional contexts, attentive to the variables that the present case holds fixed; longitudinal study of how the dispositions documented here evolve as students move into professional practice; and cross-disciplinary comparison across design sub-disciplines that may engage AI under materially different conditions. Whatever the trajectory of generative AI itself, design education's task is unlikely to consist in choosing between adoption and prohibition. It is more likely to consist in cultivating, in students, the critical literacy through which AI can be read as one more material of design – a material with particular affordances, particular costs, and a particular relationship to the question of who, in the act of designing, is doing the deciding.

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