FOSTERING CRITICAL AI LITERACY THROUGH ART ASSIGNMENTS: LOOKING TO THE FUTURE WITH MY DEAR COLLEAGUE GPT

Henrique S. ANDRADE, ISCTE – Instituto Universitário de Lisboa, Portugal, henrique_andrade@iscte-iul.pt

1. Introduction

This paper argues that artistic research pedagogies, particularly those based on creative enquiry and experimentation, provide valuable approaches for developing critical AI literacy: the ability to comprehend, challenge, and engage with AI ethically.

The article explores how an art assignment situated within an art-based educational setting can function as a catalyst for critical reflection and creative agency in relation to AI. Through the case study of a collaborative artistic research laboratory (Cri_Lab) in Lisbon, the paper examines how students negotiated authorship, meaning and ethical responsibility when co-creating with AI. The assignment invited students to imagine a speculative future for education and the city, transforming AI from an instrument into a fictional collaborator.

This experiment is grounded on a framework informed by Yuk Hui's (2023) highlight the tension between the "knowing" and "not knowing", which emphasizes the cultivation of uncertainty as a prerequisite for human creativity (Dunker, 2021). Similarly, James Bridle's (2023) concept of planetary intelligence broadens the notion of intelligence to encompass non-human and technological entities. Together, these perspectives challenge the idea that knowledge is measurable or finite, inviting us to rethink learning as an open-ended, relational, and speculative process.

This paper has two aims: first, to demonstrate how artistic methods can encourage critical thinking about the use of AI in education; and second, to discuss how designing and carrying out an art assignment can encourage epistemological openness and creative-critical thinking. This argument is developed in the following sections through a theoretical discussion, an account of the session design and implementation, and a reflective analysis of its pedagogical implications.

2. Towards an Epistemology of the Unknown: The Art Assignment as a Non-Methodology

Yuk Hui (2023) connects the fear and misunderstanding surrounding artificial intelligence with an apocalyptic vision of the future, an inheritance of cultural and religious narratives that treat history as something destined to end. Drawing on Hans Blumenberg (1985), Hui (2023, p. 1) argues that modernity remains, in part, tied to secularization of religion, just like AI is tied to machines stereotype and imaginary of machines. This reduction of meaning prevents understanding and critical engagement with technology.

Interviewing Hui, Anders Dunker proposes that "if our desire to calculate everything has only succeeded in making the end predictable, then in order to regain the future we must nurture our relationship to the unknown" (Dunker, 2021, para. 2). In response to the interviewer, Hui proposes an epistemology of the unknown, where art, unlike science, operates in the in-between of what is and is not known. For this reason, art remains viable beyond the limits of knowledge. The author explains that technology is about making thought calculable; yet it also tends to cause what cannot be calculable, or is disastrous, this is where art might have a role to play. In the same interview, Hui asks: "Maybe it is time we turn the question around. What if we don't just ask how technology transforms the concept of art, but instead try to do the opposite and ask how art can transform technology?" (Dunker, 2021, para. 15).

In W*Ways of Being* 2022), James Bridle argues for a system of planetary intelligence, one shared by humans, animals, ecosystems, but also machines, and therefore technology. According to Bridle this is only possible through a redefinition of the concept of intelligence, as something not only inherently human, as something active and not only a capacity. Doing so opens possibilities of interaction and recognition with non-human entities. In this framework technology might also be seen not only as something to be mastered but instead as something to dialogue with, even if this interaction preserves indeterminacy, and the unknown. The hyperfocus on the machine or instrument can also shift to the user. "We use our machines, often without really understanding what it is they´re doing, and uncritically accept the world they present to us. They come to define our reality and to erase the awareness that other realities even exist" (Bridle, 2022, p. 175).

Artistic practice and research can activate such epistemological openness, as it situates creation and making as modes of inquiry, thinking through making. In blurring disciplinary or methodological boundaries, art-based approaches draw from cognitive, emotional, and embodied dimensions of understanding (Barrett & Bolt, 2010; Borgdorff, 2012; Leavy, 2009). In this sense, creation can be a method but also a site for knowledge production (Mäkelä, 2015). The very notion of knowledge is transformed to something relational and situational, one that can embrace experimentation and ambiguity.

In *Pedagogy of the Oppressed* Paulo Freire (1970) defines critical literacy as the ability to analyze and transform social and cultural contexts through an inherently political practice. Within technological contexts, knowledge can be framed as a form of empowerment – particularly when enacted through educational processes (Schaper et al., 2022). Pangrazio (2016) emphasizes that digital critical literacy is a complex endeavor, challenged by the persistent tension between technical mastery and critical disposition. This tension requires the capacity for inquiry, analysis, and critique, rather than mere operational competence. A recent scoping review and framework synthesis of educational activities that support young people's reflection on artificial intelligence identified the ability to analyze, question, and transform the implications of AI as critical AI literacy (Veldhuis et al., 2025). The study underscores that AI literacy should not be confined to the computer science curriculum but rather integrated across disciplines through cross-curricular projects.

> Typically, critical thinking is believed to include the component skills of analyzing arguments, making inferences by using inductive or deductive reasoning, judging or evaluating, and making decisions or solving problems. Background knowledge is believed to be a necessary, though not sufficient, condition for enabling critical thought within a given subject. Critical thinking entails cognitive skills, or abilities, and dispositions. These dispositions, which can be seen as attitudes, or habits of mind, include open- and fair-mindedness, inquisitiveness, flexibility, a propensity to seek reason, a desire to be well-informed, and a respect for and willingness to entertain diverse viewpoints (Lai, 2011, pp. 41-42).

In her literature review, Lai (2011) highlights the close association between critical thinking and creativity. Both are activated in the production of intellectual outcomes and in problem-solving processes, since each requires imagination, adaptability, and reflective judgment. Building on this premise, subsequent studies have argued that inquiry-based methods – prevalent in both art-based research and artistic practice – stimulate critical thinking by presenting problems with multiple solutions and encouraging divergent reasoning (Ankyiah & Bamfo, 2023; Lampert, 2006).

> Current educational programs in schools are generally focused on certain information or routine problem solving, which focuses only on one solution or correct answer. Unfortunately, this type of education guides students to accept information without inquiring and discovering new methods for problem solving. This type of education does not involve students' probing, critique, or creativity. However, using an open structure in visual arts education in the form of nonroutine problem solving with PBL can support the development of creative thinking skills through probing and critique while maintaining uncertainty (Ulger, 2018, pp. 16-17).

In Ulger's (2018) study, PBL – problem-based learning – was found to enhance creative thinking more strongly than critical thinking disposition. Nonetheless, the author emphasizes that openness, non-linearity, and the acceptance of multiple possible answers are essential preconditions for developing any form of creative and critical thought. While numerous researchers have identified conceptual overlaps between creativity and critical thinking, assessing the development of critical thinking remains a complex challenge (Lai, 2011, pp. 37-41).

Recognizing the interdependence of critical and creative thinking, yet still acknowledging the complexity of this relationship, the art assignment emerges as a practice-based pedagogical form capable of sustaining openness. Its openness promotes uncertainty through experimentation, multiplicity of responses, dialogue, and self-reflective inquiry. Within this framework, the art assignment, as conceptualized in literature close to art practice and pedagogy (Bremmer et al., 2024; Green, 2020), offers a structured openness that enables students to engage with materials, technologies, and ideas while exploring diverse possibilities in problem-solving.

Moreover, assignments can be intentionally designed to encourage experimentality and to frame failure as a productive and pedagogical moment within the creative process (Andrade

& Nunes, 2025; Sawyer, 2019). In such contexts, the teacher or educator acts as a co-learner or guide (Shreeve et al., 2010), acknowledging that even they do not possess the answers in advance – these only emerge through the practice of the assignment itself. In this sense, as exemplified by the experiment presented in this study, art assignments can function as laboratories for epistemological experimentation.

The knowledge generated through responding to an art assignment opens the possibility of engaging multiple modes of intelligence – intellectual, embodied, and affective (Clarke & Cripps, 2012). Ultimately, the art assignment operates simultaneously as a site of artistic inquiry, problem-solving, and methodological experimentation. This condition reflects a shift from learning as acquisition toward learning as practice: a dynamic process of engaging with the unknown through creation. In this way, it sustains the potential for both transformative and critical learning by exploring the productive tensions between knowing and not-knowing, art and technology.

3. Methodology

The present article employs a qualitative, practice-based, and interpretive research approach. The focus is on analyzing and discussing the results of a previously implemented art assignment undertaken within the framework of the Cri_Lab artistic research laboratory. Looking at the potentiality of drawing as a method of inquiry and a means of collaborative knowledge generation (Andrade, 2024), the methodology consists of a reflective and descriptive analysis of this session, aiming to understand how the assignment design and its implementation can inform pedagogical strategies for fostering critical AI literacy and epistemological openness through art-based learning.

The article process unfolds in three stages. First, the preparation and design of the session were examined. This involved an introduction to the context and settings of the sessions, as well as analyzing the conceptual premises that guided the assignment design. The preparatory stage was reconstructed through project notes, instructional materials, drawings and photography records, and reflections from the author.

Second, the article describes the session itself. This description includes the structure of the 90-minute class, the sequence of activities, and the interaction between students and the AI tool (ChatGPT). Particular attention is paid to the performative and discursive aspects of the assignment: how prompts were constructed, negotiated, and transformed, and how students collaboratively translated text-based dialogues with AI into visual representations through drawing. The collected materials, comprising annotated transcripts and A1 collaborative drawings, were treated as epistemic artefacts, evidencing processes of negotiation, critical reflection, and aesthetic reasoning, focusing on the relational processes that emerged: dialogue, negotiation, and the interplay between human and AI agency.

Finally, the results were analyzed and discussed through a reflective-interpretative lens in contrast to a methodological analysis. The evaluation did not aim to assess artistic quality but to identify indicators of critical engagement, creativity, and epistemological experimentation.

4. Experiment

4.1. Setting and Context

The laboratory sessions presented in this study emerged from the second edition (2024-25) of Cri_Lab – a pedagogical creative laboratory developed at M*Marquês de Pombal* econdary School, in Lisbon. The Cri_Lab is a research project that aims to implement a collaborative, process-based laboratory within institutional settings. Through art-based methods and interdisciplinary collaboration, the project focuses on space, promoting both the diagnosis of and transformation within the school´s physical space but in connection to its context within the city, and promoting spatial literacy and civic engagement among the participating students. The Cri_Lab takes an experimental approach, seeking to expand inquiry about space across different fields, by integrating the participation of artists, researchers, and stakeholders such as an architectural design studio and an art association. In order to do this, the lab took a workshop format, with weekly sessions in the first two editions (Andrade, 2025). This article refers to one of these sessions, which took place in the second edition.

The Cri_Lab took place at M*Marquês de Pombal* chool, a historical institution, connected to professional training education, whose buildings have not been significantly transformed since their inauguration in 1962. A proportion of the student population comes from economically and socially disadvantaged backgrounds does not live close to the school (Andrade, 2025). This set of conditions pushes the need for the participating students to critically engage with the relation between physical space and educational system, city and civic engagement. The session of the Cri_lab described in this study was attended by students of visual arts at Portuguese secondary education.

4.2. The Assignment Design

> Consequently, Cri_Lab rapidly started to present as an avenue to experiment within educational methodologies that integrate artistic and architectural practices into the analysis and intervention of urban spaces. It offers an innovative and critical perspective on the interrelationship between design, city, art, culture and education. (Andrade, 2025, p. 266)

The aim of the Cri_Lab was to encourage students to critically examine the relationship between physical space and the educational system, as well as the interplay between city and civic engagement. The question of school representation was addressed through multiple artistic methods, such as, photography, filmmaking, drawing, installation – functioning as tools of inquiry and not only expression. Through these practices students engaged in critical discussions concerning the time of this representation (past, present and future) but also, the extend through which representation may mirror or challenge reality.

In this sense, the school was often imagined as it was in reality, but also how it could or should be different, emphasizing the power of imagination and speculation as tools for transformative action. Within this framework, AI tools naturally emerged as a tool continuously present in students' daily lives. At the same time, they are more and more present in educational discourse, often accompanied by fascination or fear.

The design of this assignment was, therefore, grounded on this need to imagine the future of school and education, in other to mobilize action, but also to use it to interrogate the present through critical thinking. Utopia as a method holds a lot of potential to fulfill this gap. This approach resonates with utopian imagination, and its capacity to harness imagination around architecture, repositioning students as active transformation agents of the city and education (Nascimento, 2025). Moreover, building upon Čulek (2023) understanding of utopia as a critical method, one that operates through narrative and spatial articulation, a discursive practice either when unfolding through images or words. Following this premise, the assignment foregrounded the interplay between text and drawing as a generative medium, where language becomes the catalyst for imagination, and drawing acts as a discursive tool.

This framework contributed to constructing a narrative context that introduces the assignment, adopting a storyline approach, providing a "supportive ethos which helps to develop a 'can do' attitude where pupils take a risk and are creative in order to respond of the requirements of the storyline" (Tarrant, 2019, p. 30). These approaches can start from some what the students already know– how to use AI – and builds up on characters and narratives that deliver more questions where new knowledge may appear (Bremmer et al., 2024).

Within this utopian speculative narrative framework, the activity was framed around the fiction of AI as a colleague, a fellow student who has the intention of working individually and deliver all the work finished. This colleague was tasked, along with the students, to create the school of the future as something that will happen for sure. In this way, AI becomes a symbolic actor in the realization of the utopia. The students have to decide how far they wish to participate in or resist this automated utopia, beginning a process of back and forth with the technology. Through this narrative framing, students are imagining the school and education of the future while also, reflect critically in their own role in reshaping technological futures.

4.3. Session Diary: Performing the Assignment

The 90-minute session was attended by 10 students who divided themselves in four working groups. The activity was presented as a collaborative experiment in designing a vision of what the school might look like one hundred years after 2025. This was portrayed as an important task, since the fiction was that this experiment would definitely happens. Each group was then informed that a new member would join their team and contribute to the creative process. This fictional team member, ChatGPT was personified as someone who does not know how to work collaboratively. However, since these new members, were also very efficient, they would probably end up doing all the work for the group if the other members decided to accept their ideas. The students were presented with this paradoxical dilemma: on the one hand, they had to imagine the future as both a utopia and something that would become reality, on the other hand, they had to negotiate with a non-human collaborator and decide how much they would outsource to the algorithm.

The activity began with all groups receiving the same initial prompt: 'We are a group of students from a school in Lisbon. Imagine that our descendants will attend the same school in the future. Describe their daily life, imagining that the city they travel through to get to school and back home, and the school itself, provide them with everything they need to learn, gain useful tools for their future and become free citizens. That also contribute to their happiness. Describe in three paragraphs a day in the life of one of these descendants, with all the changes that the city and the school have undergone over the next 100 years to make this happen. Do this in a 300-word text.'[1]

The first step was for each group to transcribe the provided prompt onto an A1 sheet of paper. While transcribing, the students were free to change the prompt by adding or removing parts as they saw fit. This was the text that they would deliver to their efficient colleague, ChatGPT, according to the storyline. Some groups added to the prompt, while others kept it as it was, focusing on transcribing it, a task which some of them also found useless. Ultimately, the four groups transcribed the final prompt which generated textual descriptions of the imagined school of the future.

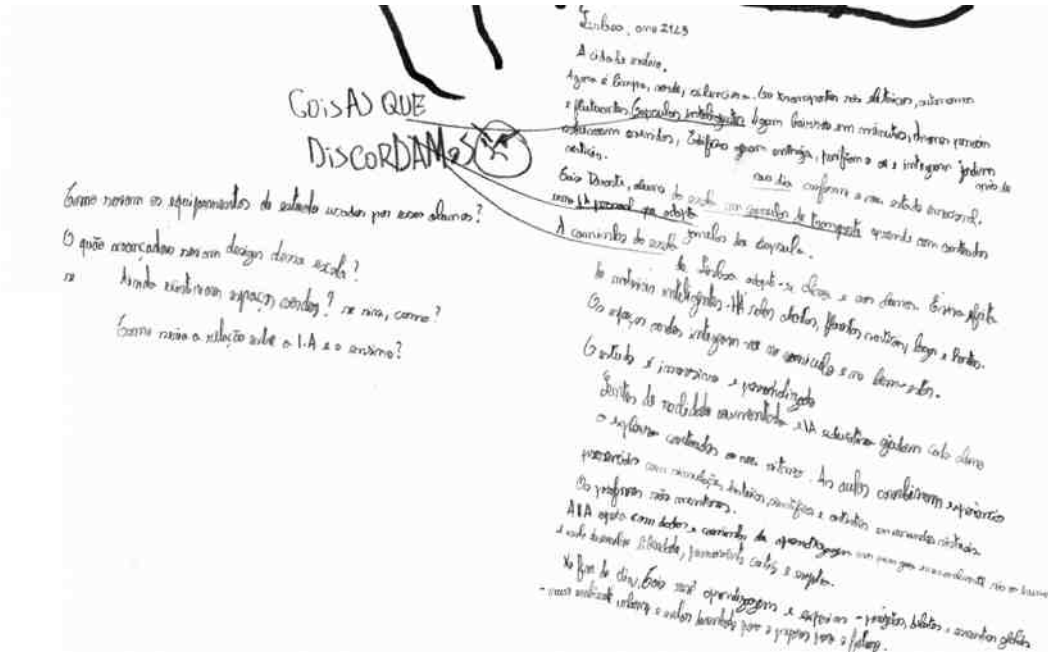


Figure 1. Detail from Transcriptions and Motes in One of the Panels, Student Works Produced During the Cri_Lab,
Source: Photograph by Henrique Andrade

[1] Translated from Portuguese to English.

The response from ChatGPT was transcribed onto paper again, and the students highlighted or annotated the parts with which they agreed or disagreed. The same tensions arose as when transcribing the prompt. Some of the students focused entirely on completing the time-consuming task of transcribing the text by hand, while others paused to reflect on or modify it. This tension also sparked some conversation between groups, as they compared strategies: to accept what the AI presented and finish earlier in comparison to the cost of accepting certain parts of their texts. Discussions and negotiations also took place between groups as they debated the kind of future they wanted, leading to questioning or supporting the AI's techno-optimistic tone. In this way, authorship was negotiated as students decided how much control they would give to the AI.

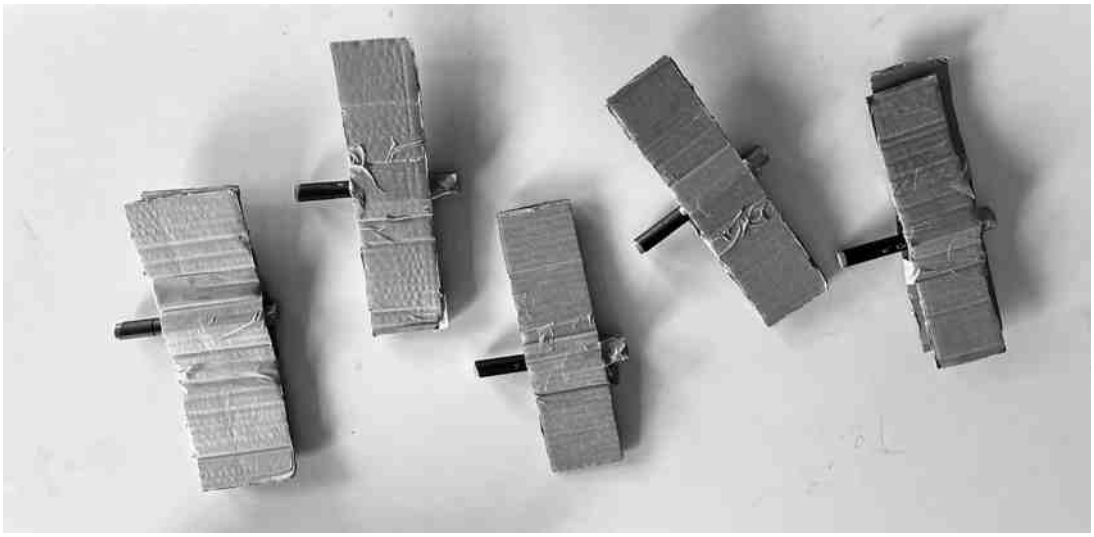


Figure 2. Collaboration Devices Used in the Session
Source: Photograph by Henrique Andrade

Once the group had finalized the revised text and transcribed it onto A1 paper, the session moved on to the collaborative drawing phase. AI was excluded from this phase, but collaboration devices were used instead, as can be seen in the figure. Each group worked on the same A1 paper on which the text had been transcribed, translating the visual text into a drawing. The collaboration device had to be operated by two people at the same time, who negotiated much as they had in the textual editing phase, but this time through gestural coordination and shared visual imagination.

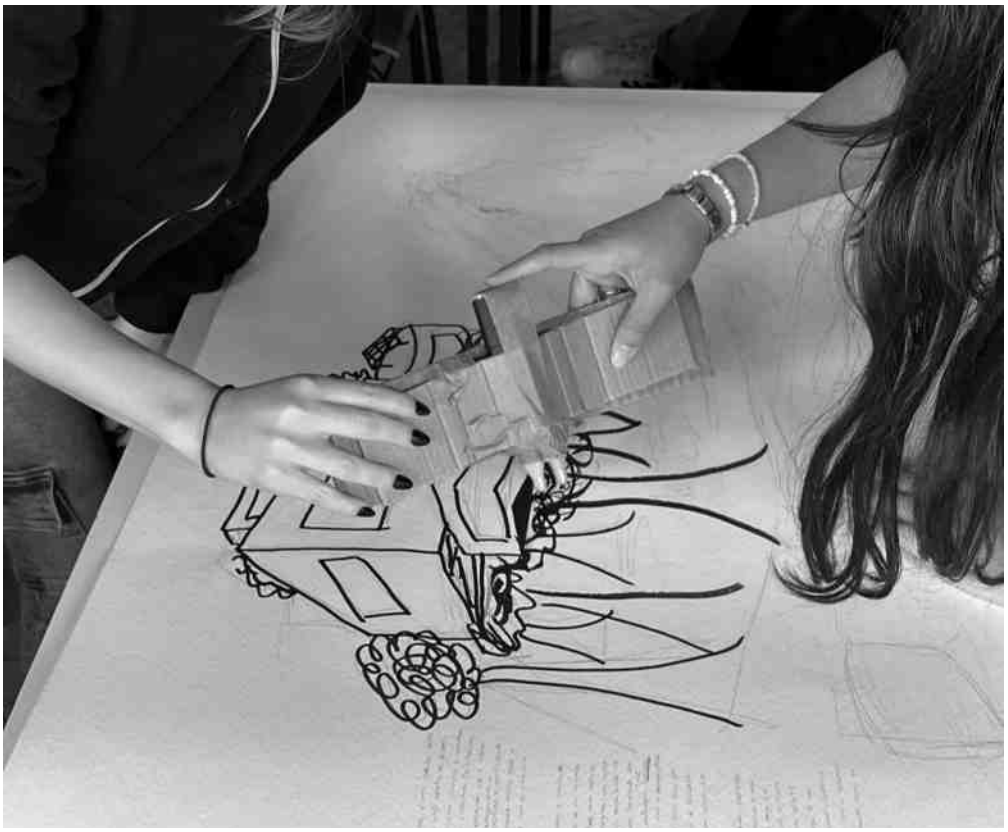


Figure 3. Two Students Using a Collaborative Device for Drawing
Source: Photograph by Henrique Andrade

Ultimately, the resulting A1 papers encapsulated the collaborative process between students and AI, combining text and images. Each panel combined transcriptions of the prompt and ChatGPT response, handwritten edits and critical comments, notes of agreement or disagreement, and a layered collaborative drawing representing the school of the future. The resulting images varied widely and included hints at renewable energy sources, new construction methods and alternative means of transportation. Observation showed that the groups focused intensely on following every part of the text while performing the collaborative drawing. Conversation continued throughout but took a more visual-based approach as the students were drawing. In the richness of the elements, the drawings became deeply hybrid as they merged different representation strategies and were dialogical.

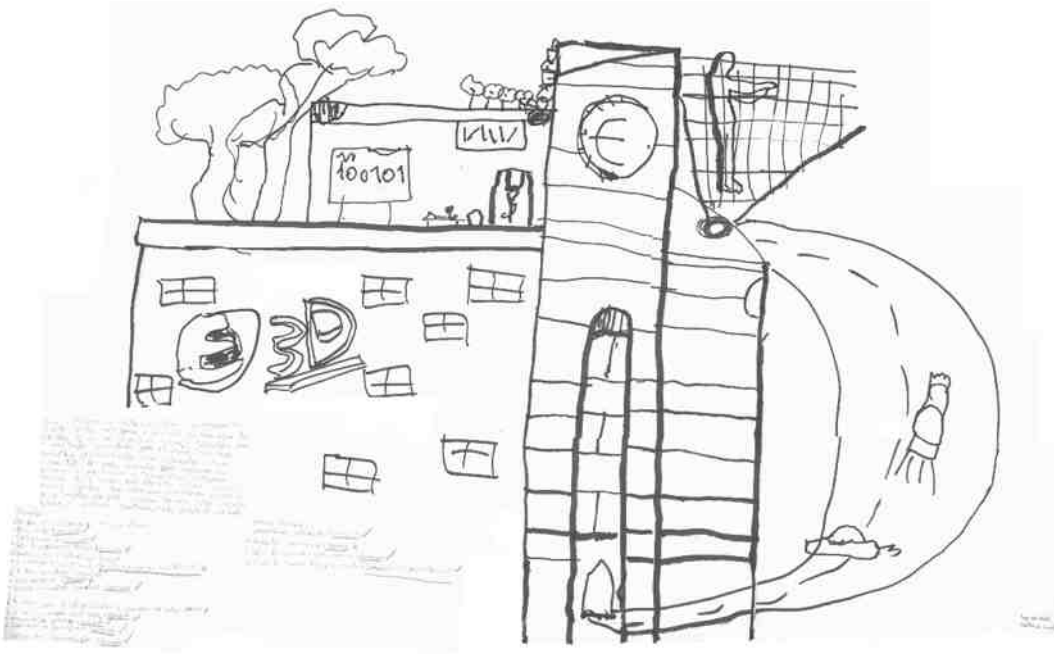


Figure 4. Group Panel 1, Student Works Produced During the Cri_Lab
Source: Photograph by Henrique Andrade

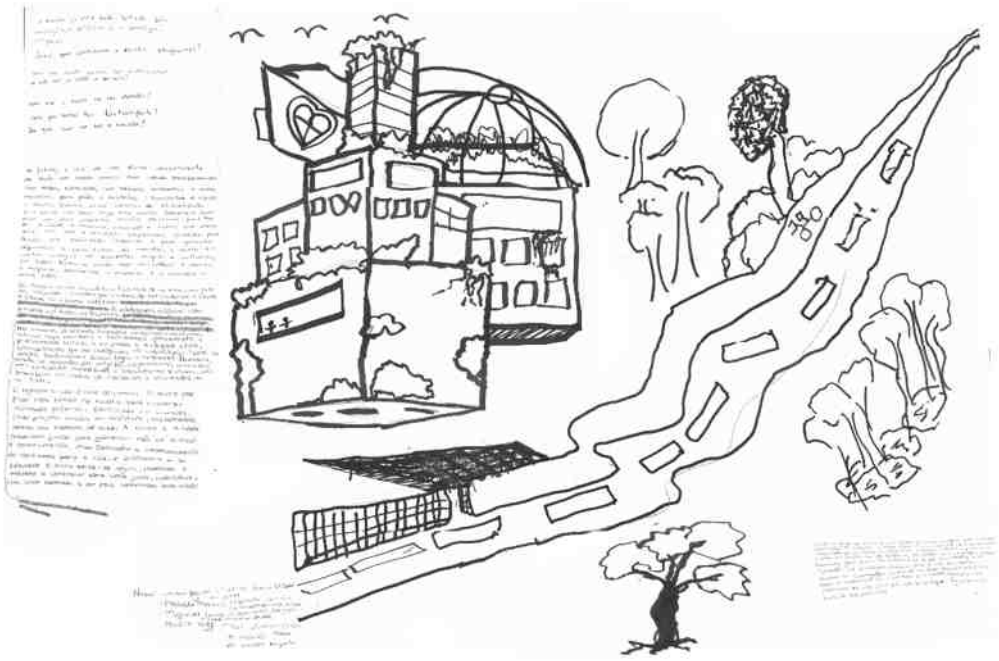


Figure 5. Group Panel 2, Student Works Produced During the Cri_Lab
Source: Photograph by Henrique Andrade

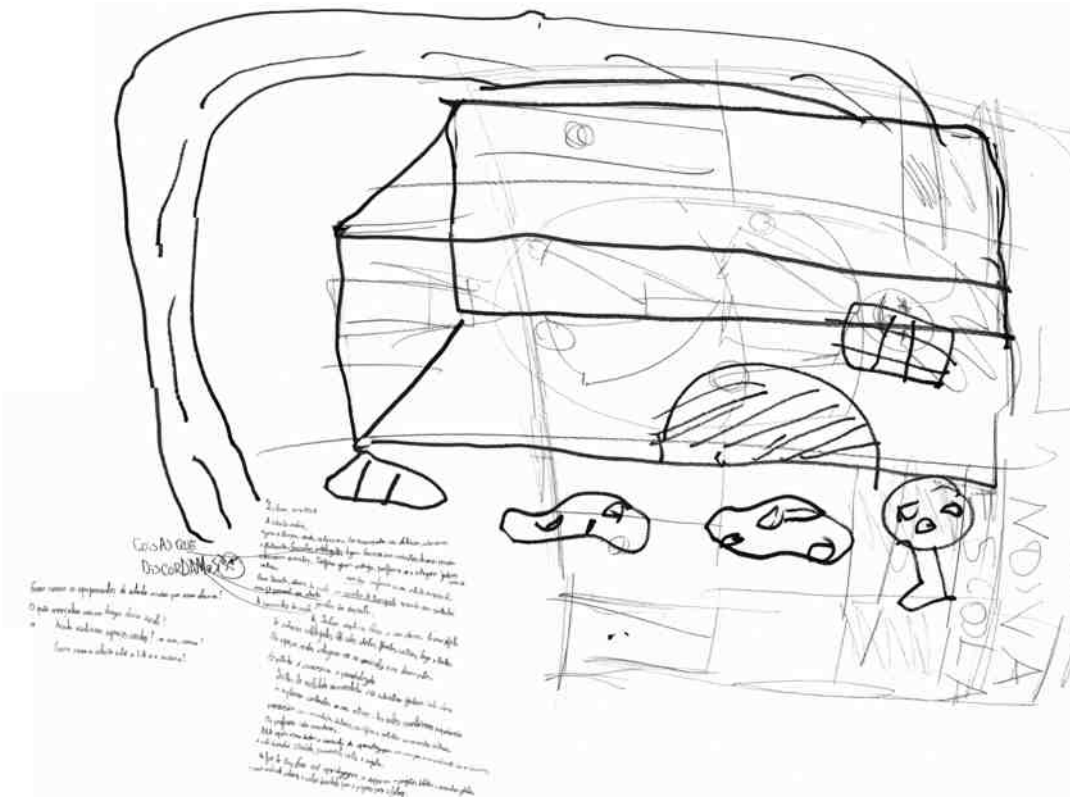


Figure 6. Group Panel 3, Student Works Produced During the Cri_Lab
Source: Photograph by Henrique Andrade

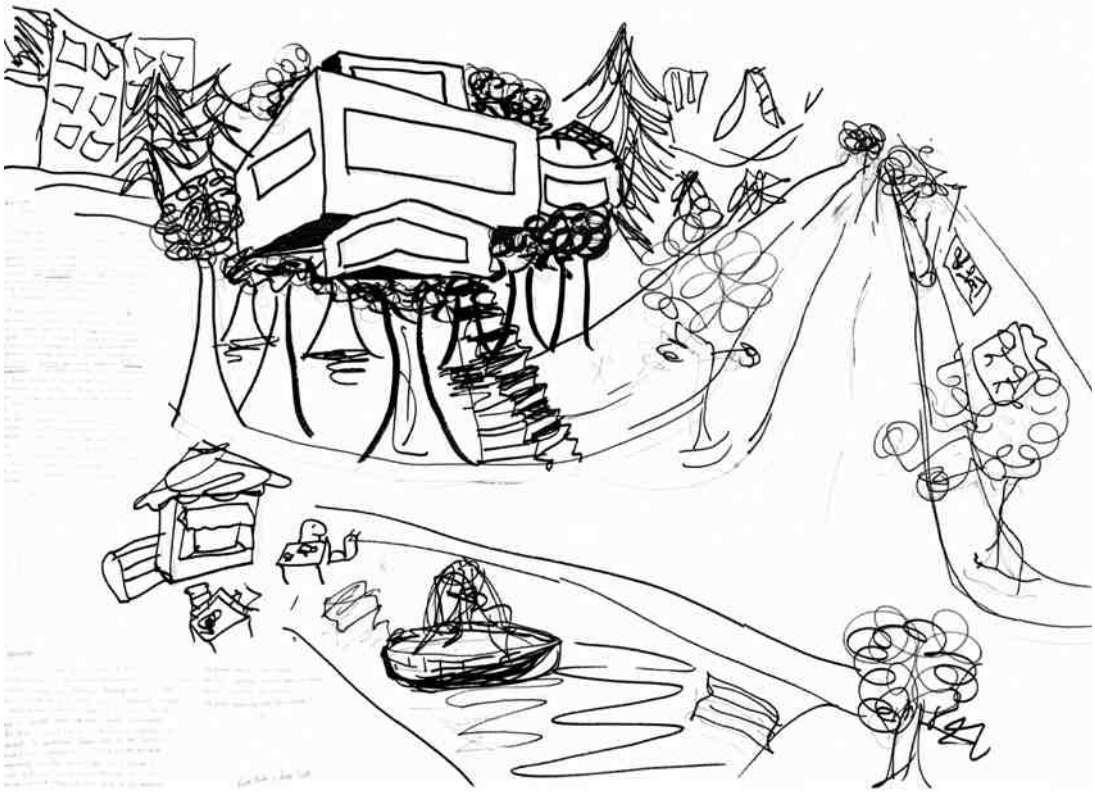


Figure 7. Group Panel 4, Student Works Produced During the Cri_Lab
Source: Photograph by Henrique Andrade

5. Discussion

Within the framework of artistic and design research, as well as critical pedagogy, the activity discussed in this paper highlights the potential of the art assignment as a catalyst for inquiry, transformative and critical thinking when applied to the use of ChatGPT in a creative process. The session revealed how the assignment inverted the classical hierarchical interaction between user and tool, as referred by Bridle (2023). By repositioning roles, through a narrative approach, the assignment activated new forms of negotiation, reflection and creative agency. In an epistemological experimentation, uncertainty, possibility and dialogue became the main drivers of learning. The discussion will follow seven points of pedagogic value identified in this experience: (1) uncertainty; (2) dialogue and collaboration; (3) creativity and authorship; (4) utopia and possibility; (5) a non-methodology, (6) process as knowledge; (7) critical AI literacy in practice.

(1) Inverting the pursuit of predictability and control, as suggested by Hui (2023) and Bridle (2022), changes the paradigm of everyday interaction with technology. Technology was introduced, not as a tool, but an entity, whose actions students could not fully anticipate, meaning they had to negotiate with it. Students were aware that ChatGPT could produce coherent and convincing narratives, but not necessarily meaningful, ethical or in accordance with what they want or believe. This tension allowed for the practice of critical inquiry, by editing, contesting, rewriting or even deciding to accept, in a setting of controlled destabilization, that encouraged students to assume responsibility for meaning making. In this way, uncertainty became, not only a limitation but a condition for learning from a field of indeterminacy, where the state of not knowing is the only productive one.

(2) Dialogue happened both among the participating students but also between humans and the non-human actor. Dialogue and collaboration were of course strategies of the previous referred negation process. The tension between individual and other subjects allowed for the recognition of plurality of ways of thinking, through disagreement, agreement but also empathy and care amplified by the presence of AI. As groups moved from text to drawing, dialogue became embodied, both to the collaborative use of the drawing devices and recognizing that some contributes of AI made their way to the representation of the school of the future through the body of the students, in a logic role inversion. In this way, collaboration was utilized as a method of thinking by doing, that highlighted empathy, negotiation and co-creation as potential components of critical literacy.

(3) Building from dialogue and collaboration, both with other students and AI, presents a need for critically disturb notions of authorship. A problem very pertinent to critical AI literacy around contemporary discussions of how the tool could replace humans in creative processes and ethics around authorship. Through the assignment, this matter was treated through a relation approach as AI takes a similar role to human participants of the group. This confrontation weighted on the process of creative decision making. However, the assignment allowed for the problem to appear in a constructive way, as authorship became dialogic, in a performative process of negotiating creative control while recognizing apposition for a hybrid authorship.

(4) Utopia as a method contributed to add a sense of ethical weighed to creative decision making in a context of hybrid authorship. On the one hand, utopia provides a framework for expanding possibility beyond the boundaries of a status quo, by enabling participants to imagine alternatives, yet grounded in the existing reality of the school. By setting utopia, in the narrative context of the assignment, as a future that will be materialized, decision carries moral and social implications. In this way, the act of making is weighted by ethical responsibility. Along these lines, utopia becomes a space for freedom but also accountability. When applied to AI literacy utopia as a method as the potential to become a form of critical pedagogy.

(5) The term 'non-methodology' is not used in this study to describe a process without methodology, but rather a way of designing an assignment that deliberately resists closure or formula in order to allow for possibility and adaptability. This applies not only to students, but also to educators, researchers and facilitators involved in the process. The goal is to design a methodology that enables all participants to navigate uncertainty without predetermined outcomes, positioning the educator as equally subject to discovery. This role situates facilitators within the same field of inquiry as the students, confronting the same challenges and questions. Such a configuration not only flattens hierarchies but also opens the possibility of exploring alternative ways of doing research, grounded in reciprocity, reflection, and shared experimentation.

(6) Linked to the framework of 'non-methodology' this session highlights the potential of the process as a site for knowledge production. Learning happened mostly on reflective, relational, and embodied actions in the process, then in the final outputs. Iteration was a big part of the session, present in both moments of writing, editing, discussing and drawing. By prioritizing process, failure hesitation and trial and error, can all be forms of learning. Results are more evidence of inquiry than representations of solutions to the fictional problem.

(7) Through all the previously referred pedagogical values, critical AI literacy was reframed as an embodied practice, something you can not only learn but practice. In this way students learn through AI, by being present with complex problems through its use. This fact was elevated by the inversion of the role of technology as a tool. Decisions taken by the groups of students, even when deciding to accept, became an exercise of agency and discernment towards it. Ultimately, the attempt to learn critical AI literacy by doing, emerged as both cognitive, creative and ethical.

Looking at this session, it is important to note some limitations and difficulties. This small-scale experiment explored the potential of art- and design-based approaches to promote critical AI literacy. Replicating or expanding this experience would be a valuable contribution to research, for instance by increasing the scale or the time available for the experiment. Ethical and sustainability issues regarding the use of AI must also be considered when suggesting the possibility of its integration into art practice, particularly in the context of art education. These include the environmental impact of AI use and the possible reproduction of cultural bias and commercial logics. However, this experiment was based on the premise that such issues should be addressed through critical thinking and education. Despite these concerns, the study demonstrates the transformative potential of the art assignment in fostering critical thinking when addressing complex issues such as the ethical, cultural, and creative aspects of AI systems.

6. Conclusion

This study explored the potential of art-based research pedagogies to promote critical AI literacy by designing and implementing an art assignment that deliberately engaged with uncertainty, collaboration, and speculative imagination. Within the framework of an epistemology of the unknown, the experiment demonstrated how the work of Yuk Hui's (2023) and James Bridle's (2022) can inform educational experimentation. This involved reconsidering technology as a relational field that can foster empathy, reflection, and agency, rather than as a deterministic force. By framing AI as an unpredictable collaborator rather, the activity positioned students as critical agents within a co-creative process. The assignment's structure encouraged students to negotiate meaning, authorship, and ethical responsibility. Through writing, editing and collaborative drawing, students practiced critical reflection as an embodied and dialogical practice.

The findings suggest that uncertainty and experimentation have the potential to be used as pedagogical tools for cultivating critical literacy. An approach that intentionally resisted closure or predetermined outcomes was utilized, enabling the classroom to operate as a laboratory of experimental openness. This approach redefined the educator's role as a co-learner, fostering reciprocity and shared discovery.

Although limited in duration and scope, this experiment points towards possible future developments. Extending the timeframe, adapting it to different contexts or conducting follow-up sessions with participants could provide valuable insights, particularly by incorporating students' reflections on the process and its perceived value.

Finally, acknowledging the difficulty of quantifying the contribution of these methods to critical thinking, this study reiterates Hui's (2023) warning against reducing technology, and by extension knowledge itself, to what can be measured or calculated. Some forms of learning and awareness resist quantification precisely because they engage with the relational, affective, and ethical dimensions of knowledge. This study therefore contributes to reimagining pedagogy as a form of action research. Rather than producing fixed formulas, it continually subjects itself to critical reflection. As an artistic experiment, it also highlights the need to recognize that, even when treated as a non-human entity, technology is still shaped by humans and that identifying this tension is a critical and creative task itself.

Acknowledgements

Sincere thanks to the Marquês Pombal students who participated in the workshop. The author also expresses gratitude to Fundação para a Ciência e Tecnologia (FCT) for the research grant funding, and to DINÂMIA'CET – Iscte – Centre for Socioeconomic and Territorial Studies for supporting the author's research activities.

Funding

Fundação para a Ciência e a Tecnologia (FCT), funding of the research grant with the reference 2024.04693.BD.

References

Andrade, H. (2024). Drawing Research: Creative Approaches to Architectural Research. In P. Guerra & S. Sousa (Eds.), *Todas as artes*, Vol. 3 (pp. 228-243). Universidade do Porto, Faculdade de Letras.

Andrade, H. (2025). Critical Spatial Practice in the Context of Art Education: The Cri_Lab Sessions Conducted at Marquês de Pombal School, in Lisbon. In P. Guerra & S. Sousa (Eds.), *Todas as artes: todos os nomes* (pp. 264-279). Faculdade de Letras da Universidade do Porto.

Andrade, H. S., & Nunes, J. (2025). The Pedagogy of Failure in Experimental Art Processes: Cyanotype and Monotype as Methods to Foster Creativity and Build Up Artistic Confidence. In MUSICOGUIA (Ed.), *7th interdisciplinary and virtual conference on arts in education*. Adaya Press.

Ankyiah, F., & Bamfo, F. (2023). Examining Studio-Based Art Practices as a Means of Fostering Critical Thinking Skills in Young Learners. *International Journal of Childhood Education*, 4(2), 106-116.

Barrett, E., & Bolt, B. (Eds.). (2010). *Practice as Research: Approaches to Creative Arts Inquiry*. I.B. Tauris.

Blumenberg, H. (1985). Progress Exposed as Fate. In Wallace, R. M. (Trans.). *The Legitimacy of the Modern age*. MIT Press.

Borgdorff, H. (2012). *The Conflict of the Faculties: Perspectives on Artistic Research and Academia*. Leiden University Press.

Bremmer, M., Heijnen, E., & Haanstra, F. (2024). *Wicked Arts Education: Designing Creative Programmes*. Valiz.

Bridle, J. (2023). *Ways of Being: Animals, Plants, Machines: The Search for a Planetary Intelligence*. Penguin Books.

Clarke, A., & Cripps, P. (2012). Fostering Creativity: A Multiple Intelligences Approach to Designing Learning in Undergraduate Fine Art. *International Journal of Art & Design Education*, 31(2), 113-126.

Čulek, J. (2023). *Utopia as Critical Method: A Comparative Analysis of Six Architectural and Literary Utopias* (Doctoral dissertation). Delft University of Technology.

Dunker, A. (2021). *Planetary Thinking: Philosopher Yuk Hui Asks How Art Can Transform Technology* [Interview]. Kunstkritikk. https://kunstkritikk.com/planetary-thinking/

Freire, P. (1970). *Pedagogy of the Oppressed*. Herder and Herder.

Hui, Y. (2023). ChatGPT, or the Eschatology of Machines. *e-flux journal*, (137). https://www.e-flux.com/journal/137/544816/ChatGPT-or-the-eschatology-of-machines

Lai, E. R. (2011). *Critical Thinking: A Literature Review. Pearson's Research Reports*, 6(1), 40-41.

Lampert, N. (2006). Enhancing Critical Thinking with Aesthetic, Critical, and Creative Inquiry. *Art Education*, 59(5), 46-50.

Leavy, P. (2009). *Method Meets Art: Arts-Based Research Practice*. The Guilford Press.

, M., Flint, A. S., & Van Sluys, K. (2002). Taking on Critical Literacy: The Journey of Newcomers and Novices. *Language Arts*, 79(5), 382-392.

Mäkelä, M. (2015). Knowing Through Making: The Role of the Artefact in Practice-Led Research. In R. Nelson (Ed.), *Practice as Research in the Arts: Principles, Protocols, Pedagogies, Resistances* (pp. 162-179). Palgrave Macmillan.

Nascimento, I. (2025). The New Fado of the Students. In R. Assoreira Almendra (Ed.), *Which Proximity in Design Education?* (pp. 15-23). Routledge.

Pangrazio, L. (2016). Reconceptualising Critical Digital Literacy. *Discourse: Studies in the Cultural Politics of Education*, 37(2), 163-174.

Sawyer, R. K. (2019). The Role of Failure in Learning How to Create in Art and Design. *Thinking Skills and Creativity,* 33, 100527 10.1016/j.tsc.2018.08.002

Schaper, M.-M., Smith, R. C., Tamashiro, M. A., Van Mechelen, M., Lunding, M. S., Bilstrup, K.-E. K., Kaspersen, M. H., Jensen, K. L., Petersen, M. G., & Iversen, O. S. (2022). Computational Empowerment in Practice: Scaffolding Teenagers' Learning about Emerging Technologies and their Ethical and Societal Impact. *International Journal of Child-Computer Interaction*, 34, 100537.

Shreeve, A., Sims, E., & Trowler, P. (2010). 'A kind of Exchange': Learning from Art and Design Teaching. *Higher Education Research & Development*, 29(2), 125-138. 10.1080/07294360903277333

Tarrant, P. (2018). *A Practical Guide to Using Storyline Across the Curriculum: Inspiring Learning with Passion*. Routledge.

Ulger, K. (2018). The Effect of Problem-Based Learning on the Creative Thinking and Critical Thinking Disposition of Students in Visual Arts Education. *Interdisciplinary Journal of Problem-Based Learning*, 12(1).

Veldhuis, A., Lo, P. Y., Kenny, S., & Antle, A. N. (2025). Critical Artificial Intelligence Literacy: A Scoping Review and Framework Synthesis. *International Journal of Child-Computer Interaction*, 43, 100708.