



A Focus on Pedagogy

2025

AMPS Proceedings Series 47.3

Emerging Theories, Teaching & Technologies

AMPS PROCEEDINGS SERIES 47 v3

Leeds Beckett University, UK | Marywood University, USA | KU Leuven, Belgium

19 – 21 November, 2025

A Focus on Pedagogy

Emerging Theories, Teaching & Technologies

EDITORS & ORGANISERS:

Aurelie De Smet, Michelle Pannone, Kim Hagan, Ben Hall, Jo Hassall

EXECUTIVE PRODUCTION EDITOR:

Amany Marey

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AMPS PROCEEDINGS SERIES 47. ISSN 2398-9467

INTRODUCTION

A Focus on Pedagogy Emerging Theories, Teaching & Technologies

Academia: the epitome of an 'ivory tower'. A bastion of siloed thinking. Distanced from the 'real world'. The criticisms of what we do as educators can be cutting. However, today, many identify that academia is 'turning outwards'. No longer beholden to established practices, it is increasingly diverse and varied. We see this in student focused learning. We see it in problem-based learning. We see it in the embracing of AI. We see it in the areas we are supported to research, and the partnerships we are encouraged to make.

From a pedagogical perspective, this outward turn is accompanied by our own developments, like the rejection of 'single size' teaching styles, projects 'relevant' to the modern student, and academic-industry partnerships connecting with the 'real world'. Inside the academy we are pioneering new technologies and experimenting with educational psychology. We are pushing the boundaries of what we understand teaching and learning to be. We are influencing the world outside. The result of all this, is a modern academy that is complex, nuanced and cutting edge.

Reflecting on this, the Focus on Pedagogy 2025 conference, Emerging Theories, Teaching & Technologies, explored a multitude of issues informing contemporary academia. As a result, the papers included in this volume deal with emerging approaches to teaching and learning. They examine the effects of the digital turn, critique evolving research agendas and fields and present case studies of individual classes. Seeking to instigate debate on connecting communities, professionals and students they examine how we can best support our students – through both the changing terrain of learning, and their life outside the academy.

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REVITALIZING TEACHER AUTHORITY: A PHILOSOPHICAL FRAMEWORK CHALLENGING ADAPTIVE LEARNING SYSTEMS AND LEARNER-CENTERED EDUCATION

Author:

JONAS ROBERT L. MIRANDA

Affiliation:

SURIGAO DEL NORTE STATE UNIVERSITY, PHILIPPINES

INTRODUCTION

The desire for greater freedom and self-determination is a hallmark of progressivism in the 21st century. This shift away from authority now extends to modern educational philosophy. Learners are now given more power in the educational process. The primary argument is that education has shifted to focus on learner freedoms, influenced by progressive ideas such as Learner-Centered Education (LCE). This shift has been further supported by Adaptive Learning Systems (ALS), which utilize algorithms and artificial intelligence to tailor learning experiences to each student's needs, abilities, and progress. ALS adjusts the content, difficulty, and learning paths in real-time, helping learners receive personalized instruction that enhances their understanding and engagement.¹ These educational philosophies and technologies view education as a means to transform society, thereby promoting equality in the classroom between teachers and students. However, is greater freedom truly the approach that educative processes must adapt to fit the demands of the modern world?

Learner-Centered Education, Adaptive Learning Systems, and Their Limitations

In today's dominant LCE, teacher authority in the classroom is no longer viewed as a best practice. The prevalence of LCE has transformed classrooms into spaces that prioritize student autonomy, often at the expense of teacher authority and expertise. LCE demands a relatively high level of active control from learners over the content and processes of their education. Consequently, learners' needs, capacities, and interests shape what is learned and how it is learned.²

Meanwhile, the Philippines mandates a learner-centered curriculum under Republic Act (RA) 10533, the Enhanced Basic Education Act of 2013. According to the same law, the shift aims to provide a globally competitive education based on a sound curriculum aligned with international standards. With this law, LCE became the recommended curriculum for the entire country. Likewise, the Department of Education (DepEd) partnered with Khan Academy Philippines Inc., an example of an ALS, last August 5, 2024, through a memorandum of agreement to provide more learners access to digital learning content.³

Khan Academy offers a personalized online learning resource for individuals of all ages, embodying the ideals of LCE. With practice exercises, instructional videos, and a personalized learning dashboard, Khan Academy empowers learners to study at their own pace, both in and out of the classroom. Covering subjects from kindergarten through early college, including math, science,

reading, computing, history, art history, economics, financial literacy, and more, Khan Academy focuses on skill mastery to help learners build the strong foundations they need to succeed in higher education and in their careers.⁴

There are three ‘justificatory narratives’ for the implementation of Learner Centered Pedagogy. The first is the ‘economic’ perspective, which is based on the assumption that Learner Centered Pedagogy will better prepare students for the demands of a changing world. National governments are understandably interested in becoming as economically competitive as possible, and the argument is that young people will need specific key skills, such as critical thinking and creativity, to achieve such competitiveness. These skills are more likely to be fostered through Learner Centered Pedagogy. The second justificatory narrative is the ‘cognitive’ perspective, which essentially means that children learn more effectively under Learner-Centered Pedagogy than under previous approaches. Learner Centered Pedagogy is often associated with constructivist theories of learning, which suggest that such approaches may have significant benefits and lead to ‘deeper’ learning compared to behaviorist approaches. The third and final justificatory narrative is the ‘emancipatory’ perspective, which suggests that Learner-Centered Pedagogy may have wider benefits to society, such as reducing inequalities, giving students a greater voice, and viewing knowledge as less ‘fixed’.⁵ However, in the same paper, the findings lead to the conclusion that there is a real gap in hard data to prove or disprove the value of Learner-Centered Pedagogy, especially given its continued prominence in worldwide policy discourses.⁶

Another research article provides a comprehensive descriptive overview of the implementation of learner-centered pedagogy in low- and middle-income countries. Considering that considerable time, money, and resources have been invested in learner-centered pedagogy in many countries worldwide, a comprehensive body of evidence regarding its implementation and outcomes remains lacking.⁷ The findings of the study indicate that the most pressing call for future research emerging from this systematic review is the need for more robust, objective evidence (published regardless of whether the findings are perceived as positive or negative) regarding the effectiveness or ineffectiveness of Learner-Centered Pedagogy.⁸

Moreover, a study revealed that, in general, teachers, school administrators, and students provide support for learner-centered practices in the classroom; however, barriers included the presence of systemic practices and differences in perception about learning. In this light, the recommendations were to conduct training or forums with educational practitioners focusing on the application of Learner-Centered principles in practice and to align curriculum and programs for both students and teachers with LCE.⁹ Lastly, teachers report that discursive, cooperative strategies are used; however, they face significant challenges, including insufficient resources, large class sizes, inadequate time, and a lack of teacher knowledge/skill in LCE.¹⁰ In the meantime, a lack of economic resources among learners and inadequate internet connectivity are also significant constraints that hinder the effective utilization of ALS.

Hannah Arendt on Education

In the meantime, Hannah Arendt’s political philosophy, born from an analysis of twentieth-century totalitarianism, offers a powerful lens for critiquing contemporary education by examining how the widespread adoption of LCE and the integration of ALS, while seemingly progressive, can inadvertently undermine the conditions necessary for genuine political life and critical thought.

Hannah Arendt claimed that the educational crisis in America is rooted in the country’s political temperament, which struggles to equalize or minimize as far as possible the differences between children and adults, particularly between pupils and teachers. Such an equalization can actually be

accomplished only at the cost of the teacher's authority and at the expense of the gifted among the students.¹¹

Moreover, she also claimed that under the influence of modern psychology and the tenets of pragmatism, pedagogy has developed into a science of teaching in general in such a way as to be wholly emancipated from the material to be taught. A teacher, so it was thought, is a man who can teach anything; his training is in teaching, not in the mastery of any particular subject.¹² Finally, she made it clear that the role of pedagogy and teachers' colleges in the current crisis is attributed to a contemporary theory of learning. This theory operates under the premise that true understanding comes only through personal engagement, effectively replacing learning with doing.¹³

Arendt warned that when adults refuse to assume responsibility for the world, the peer group's authority takes its place, potentially leading to a "tyranny of the majority". Specifically, a poorly executed LCE can lead to situations where teachers act more as passive facilitators than authoritative guides, thereby leaving students to navigate their educational journey primarily through peer interaction, which may not adequately prepare them for the complexities of adult life and public engagement.

By neglecting the teacher's role as a mediator who introduces children to the existing world, LCE fosters a form of "world alienation." Students are not given a shared reference point—a stable world inherited from the past—from which to judge and act. This lack of a common ground makes them vulnerable to ideological manipulation, as they lack the shared factual reality necessary for critical judgment and deliberation. That is why Arendt asserted that, usually, the child is first introduced to the world in school. Now, "school is by no means the world and must not pretend to be; it is rather the institution that we interpose between the private domain of the home and the world, making the transition from the family to the world possible at all."¹⁴

In this paper, the researcher draws inspiration from Hannah Arendt, specifically in critiquing LCE and considering the challenges that confront the modern world, which are growing more complex. The proliferation of fake news, AI-generated content, differing opinions, and an oversupply of easily accessible information is overwhelming, especially for students who have yet to truly immerse themselves in the world. Instead of viewing teaching as a passive method, this paper presents a framework for restoring teacher authority in education by reconceptualizing *teaching as action*. This framework positions teachers as figures of authority who guide students through established traditions while allowing for innovation and creativity. Authority, in this regard, is not a privation of power. Instead, it serves as a foundation upon which communities will thrive. Arendt views authority not as imposing but as its original definition of 'augment' or enhancing and building upon what is already established.¹⁵

Teaching as action is a variation of the contemporary appropriations of Hannah Arendt's idea. For example, the pearl diver approach, which Francesca Giuseffi developed. Giuseffi asserted that although Hannah Arendt begins to close the essay *The Crisis in Education* with this observation, there are no specific suggestions on how teachers can present the past meaningfully to students. However, examining Arendt's broader ideas about the past, her understanding of tradition, and her unique positing of the pearl diver metaphor may offer possibilities and questions for teaching and learning.¹⁶

The Pearl Diver Approach encourages students and participants to actively engage with tradition by recovering, examining, and reinterpreting elements of the past, referred to as "pearls," to uncover those that are most relevant and valuable for addressing contemporary issues. Tradition serves as a resource for imaginative solutions rather than a limitation on innovation.

Another variation of the contemporary appropriations of Hannah Arendt's idea was presented by Ben Atim, who asserted that educators are responsible for introducing the world to students, orienting them to the world without our imperial imposition of a singular reading of it. It is then the proper task

of teachers/educators to show the world as it is, rather than making doctrinal assertions and imposing what the world should be, which leads to moralism and indoctrination. Teachers should expose students to the many ways the world is experienced and interpreted. Of course, such exposure to the world does not fix the world as a singular phenomenon or a one-dimensional object of analysis or reflection. Nevertheless, it motivates the students to imagine new possibilities for the future. Educators must prepare students to engage with the diverse realities of the world. It means involving them in actions to make the world a true home for humane individuals. It can only be realized when we resist the reductive approach to education.¹⁷

Lastly, a variation of the contemporary appropriations of Hannah Arendt's ideas contrasts her views with those of other philosophers who are thought to have held a similar perspective on education. Education as a deliberate activity and purposive process necessarily involves mediation, in the sense that the educator mediates between the child and the world. Anders Schinkel examines these types of mediation (or aspects of the mediating role of the educator) through the work of John Dewey, Martin Buber, Hannah Arendt, and Richard Peters to explore the bearing that the mediating role of the educator—as interpreted by these authors—has on the role wonder may play in the educational process. He suggests that initiation highlights the familiarizing function of wonder, and is most readily associated with inquisitive wonder; representation draws attention to the defamiliarizing role of (in particular contemplative) wonder, as well as to its world-affirming role; and selection (the educator as 'filter') foregrounds the distinction between momentary and dispositional wonder.¹⁸

The contemporary reinterpretation of Hannah Arendt's ideas highlights two crucial points. First, it emphasizes the past as a valuable source of learning. Second, it highlights the authority granted to teachers in presenting historical narratives, enabling students to gain insights from past experiences. This guidance ensures that their initiatives remain grounded and do not deviate into radicalism as they seek to revolutionize the world.

Teaching as Action

What makes *teaching as action* a different framework? *Teaching as action* transcends mere technical skill; it represents a deliberate intervention in the lives of children, aimed at introducing them to the world they will inherit. The notion of teaching as action is deeply connected to Arendt's political philosophy. Action signifies the spontaneous initiation of something new, a unique intervention within the public realm. Teaching, in this light, is indeed an action, as it engages a newcomer (the child) with a pre-existing world, thereby fostering new possibilities for human flourishing. The authority of the teacher is what renders this action both possible and meaningful. A greater degree of authority given to teachers would not be detrimental to the learners' free will. As Zagzebski writes in *Epistemic Authority*, the authority of others is crucial for a person to become introspective and autonomous. Genuine intellectual autonomy is not formed in isolation but through exposure to other beliefs and trust in authority. In the context of education, teacher authority is not only instrumental but also a more reliable influence for the formation of the students' free will and thinking.¹⁹

Understanding teaching as a form of action emphasizes the performative and relational aspects of authority. Teachers do not simply hold authority by virtue of their institutional roles; they enact it through moments of dialogue, inquiry, and responsiveness that shape students' intellectual and moral growth. The authority exercised is public and contingent, emerging in the interplay between teacher and student, where new realms of meaning are revealed.

Teaching is often regarded as a helping profession, where prioritizing the needs of others is valued above one's own. Chris Higgins examines the aspects of teaching that can help teachers thrive without compromising their role. He proposes the concept of 'self-ful' teaching. What does it mean to consider teaching "full"?²⁰ By 'self-ful,' it implies a state where teachers can fulfill their needs and

aspirations while serving their students. Teachers who teach as action reveal their unique teaching styles and become what they want to become while doing their jobs.

The proposed framework, "Teaching as Action," reflects Chris Higgins' view on human action. It acknowledges the essential role of educators in creating dynamic environments that foster initiative, embrace diversity, and welcome unpredictability. Within these vibrant settings, authentic human interactions thrive, fostering personal and collective growth among students and teachers alike. This richness of experience is increasingly at risk due to the rise of adaptive learning systems and learner-centered education models, which, while effective at producing quantifiable outcomes, often overlook the nuanced and multifaceted nature of human experiences in the learning process. Ultimately, the depth and complexity of human engagement in education far outweigh the mere metrics of success offered by these more mechanical approaches.

In *The Human Condition*, Arendt highlights "action" as a distinctly human activity within the public sphere. This notion of action is intrinsically linked to freedom, plurality, and speech; engaging in collective action with others allows individuals to exercise their agency and facilitate meaningful political change. Moreover, Hannah Arendt explores three fundamental human activities within the *vita activa*: labor, work, and action. Labor encompasses activities vital for biological survival, such as fulfilling basic needs. At the same time, work involves creating enduring products that help stabilize human life, including buildings, tools, and other forms of infrastructure.²¹ According to Arendt, action is a revealing activity through which individuals express their essential selves to others.²² A significant characteristic of action is the inherent uncertainty of its outcomes, rendering it a complex and fascinating dimension of human behavior.²³

Likewise, the goal of human action is not merely a target to be achieved but is intrinsically woven into the activity itself. While action contains its own purpose, teaching subjects such as grammar, algebra, history, and literature transcends being an end in itself. It presents the adult world to the young, encouraging them to engage with and revitalize it. Teaching acts as a form of cultural enrichment, preserving and enhancing culture through mediation rather than invention. Teachers play a pivotal role in sustaining and extending culture by discovering the language that allows the past to communicate with the present and exploring how ideas from one context can resonate in another. This concept embodies a unique interplay between movement and realization, as well as work and action, representing a distinctive and refined form of creation that is both revealing and non-objective.

How can we understand teaching as an action when Hannah Arendt posits that action occurs in the public political sphere among peers, and when Arendt distinguishes education from public political life? Chris Higgins offers a revisionist perspective, suggesting that the classroom can function as a "space of appearances" where action occurs without subjecting students to public scrutiny. He argues that a teacher's actions can be considered actional even when engaging with individuals outside their immediate peer group. Additionally, Higgins contends that teaching is fundamentally an activity of mediation, emphasizing that teaching outcomes do not necessarily yield tangible results. He further proposes that the classroom resembles a theater, where actions are mediated, and this mediation is essential to the nature of those actions. Moreover, the curriculum represents the world as it is, acting as a form of cultural mediation that enables teachers to bridge the past and the present. Through this process, teaching reveals a distinctive form of creation that occupies the space between work and action.²⁴

CONCLUSION

Education must adopt a conservative approach to safeguard students from societal pressures, while also preparing them to embrace new possibilities. Teachers mediate between past knowledge and prospects, fostering relationships where dialogue and debate can flourish. Teaching as action embraces uncertainty while respecting tradition. By providing foundational knowledge and ethical frameworks, teachers empower students to exercise meaningful agency. Therefore, authority and autonomy should not be seen as opposing forces.

Understanding teaching as a form of action emphasizes the performative and relational aspects of authority. Teachers do not simply hold authority by virtue of their institutional roles; they enact it through moments of dialogue, inquiry, and responsiveness that shape students' intellectual and moral growth.

NOTES

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- ¹² *Between Past and Future*, 182.
- ¹³ *Between Past and Future*, 182.
- ¹⁴ *Between Past and Future*, 188-189.
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- ²¹ Hannah Arendt, *The Human Condition*, 8.
- ²² Arendt, *The Human Condition*, 180.
- ²³ Arendt, *The Human Condition*, 260.
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TRANSFORMATIVE LEADERSHIP FOR SUSTAINABLE HIGHER EDUCATION: INTEGRATING INSTITUTIONAL AGILITY, CLIMATE RESILIENCE, AND EQUITY-DRIVEN GOVERNANCE

Author:

BENJA STIG FAGERLAND, LINCOLN BLEVEANS

Affiliation:

UNIVERSITY OF SOUTH-EASTERN NORWAY (USN), NORWAY. STANFORD UNIVERSITY, UNITED STATES

INTRODUCTION

HEIs are pivotal leverage points in the sustainability transition: they operate energy- and water-intensive campuses while shaping future policy and markets through teaching and research. This paper argues that progress toward net-zero, climate resilience, and institutional trust improves when equity is treated as a binding decision constraint rather than an ex-post communication goal. We integrate three lenses: Corporate Diversity Responsibility (CDR) as the equity doctrine, the Integrated Model for Sustainable Development (IMSD) as institutional architecture, and the Dynamic Leadership Model (DLM) as execution capability under uncertainty. CDR embeds distributive and procedural equity into rules, incentives, and information flows; IMSD embeds those guardrails into portfolios and stage-gates; and DLM makes the system auditable through decision and learning metrics.¹

Aligned with Pedagogy 2025's emphasis on emerging approaches to teaching and learning, the digital turn and partnerships that connect academia with communities and industry, we treat campus-scale sustainability initiatives as curricular infrastructure. Governance choices (rules, metrics, stage-gates) are connected to explicit learning outcomes and assessment so students can practice evidence-based trade-off reasoning with equity as an ex-ante constraint.

Pedagogically, the paper treats campus operations as curricular infrastructure: students interrogate real constraints and metrics, then translate them into stage-gates, dashboards, and equity guardrails that can be assessed in class.

Empirically, we examine Stanford's Energy System Innovations (SESI)—an all-electric heat-recovery district-energy system with thermal storage—and the Stanford Doerr School of Sustainability with its Sustainability Accelerator. Using official sources, we verify reported emissions and water outcomes and use them to link technical choices to equity and governance.²

For clarity, Stanford University did not use (and does not use) the IMSD, CDR, or DLM frameworks in its institutional decision-making; we apply these frameworks ex post as analytical lenses to interpret publicly documented sustainability initiatives at Stanford.³

POSITIONING CDR: FROM CSR ADJUNCT TO GOVERNANCE ENGINE

Corporate Diversity Responsibility (CDR)—introduced in 2015—reframes diversity and equity from a peripheral HR concern to an auditable governance and performance parameter. CDR extends CSR/ESG by embedding inclusive decision rights, representation, and distributional safeguards into the “G” in ESG, linking legitimacy to innovation and adaptive capacity.⁴

In HEIs, CDR functions as an ex-ante screen in capital planning and procurement: projects that externalize thermal-safety risks, outage exposure, or price volatility onto least-resourced groups are ruled out at the concept and design stages.

In higher education governance, this logic is developed through the IMSD framework, where CDR functions as a binding decision constraint linking equity, climate resilience, renewable energy, and sustainable institutional governance.⁵

IMSD AS INSTITUTIONAL ARCHITECTURE

IMSD specifies five interlocking pillars: (1) climate-positive infrastructure; (2) social sustainability via CDR; (3) policy/regulatory integration; (4) partnerships; and (5) implementation and monitoring. Its distinctive move is to position CDR as a binding decision constraint and to operationalize that constraint through equity screens, participatory stage-gates, and monitoring that co-reports distributional indicators with environmental and financial KPIs.⁶

DLM AS CAPABILITY GRAMMAR FOR COLLEGIAL INSTITUTIONS

DLM addresses a classic HEI challenge: moving from strategy to practice at speed without eroding academic freedom or shared governance. We treat leadership as organizational capabilities—strategic imagination, coalition-building, negotiation/facilitation, and disciplined learning. To make DLM auditable, we propose indicators such as decision latency, implementation tempo, coalition density, and iteration health.

To address reviewer expectations about “leadership styles,” we map DLM capabilities to observable behaviors (distributed, adaptive, and servant leadership in practice): who convenes, who decides, how conflict is handled, and how learning is documented and communicated.

TEACHING DESIGN AND LEARNING OUTCOMES

We operationalize the IMSD×CDR×DLM model for classroom use through a case-based, scenario-driven studio. Learning outcomes: (i) diagnose climate and reliability risks using campus data; (ii) apply an equity stage-gate screen to infrastructure and procurement; and (iii) produce recommendations that can be audited against shared metrics (carbon, water, reliability, and equity KPIs).

Assessment can be rubric-based with four criteria: evidence discipline (documented data + stated assumptions), equity reasoning (guardrails and distributional impacts), feasibility (owners, timelines, stage-gates), and transparency (dashboard/reporting cadence and version control).

For instructors, the model can be implemented with three low-friction activities:

Case brief (SESI / Educational Farm microgrid): students map decisions to IMSD pillars and identify where CDR guardrails would change the feasible set.⁷

Scenario studio: teams run heatwave / price-spike / air-quality scenarios, document assumptions, and propose mitigation actions with equity rationales.

Assessment sprint: students build a one-page ‘governance dashboard’ (carbon, water, reliability + equity KPIs) and defend it in a structured peer review.

METHODS: THEORY-TO-PRACTICE CASE AT STANFORD

We use a theory-informed case with document triangulation: peer-reviewed literature (incl. IMSD+CDR), Stanford institutional sources (Stanford Report and official SESI/Doerr pages), and SESI technical documentation. Claims are limited to publicly verifiable facts. Stanford is selected because SESI is a rare campus-scale conversion to all-electric heat recovery with published outcomes, and the Doerr School/Accelerator provides an institutional mechanism to translate research into policy and practice.⁸

This application is retrospective: the IMSD, CDR, and DLM frameworks were not employed by Stanford in the design or authorization of SESI or related decisions; they are used here solely to structure and compare publicly reported outcomes.

SESI: ARCHITECTURE AND PLATFORM EFFECTS

Stanford's Energy System Innovations (SESI) replaced gas cogeneration with low-temperature hot-water and chilled-water networks, heat-recovery chillers, and thermal storage that shifts demand across hours. Roughly 22 miles of piping connect buildings and the central energy facility, enabling simultaneous heating and cooling with high-yield heat recovery; building conversions now number ≈ 155 . A data backbone and predictive control make performance legible for governance, research, and teaching.⁹

Viewed through IMSD and CDR, SESI also compels distributional analysis: thermal comfort and complaint patterns by building/user group, outage exposure for critical services, and affordability/volatility exposure for students, labs, and residences. When the learning infrastructure is the energy infrastructure, pedagogy, governance, and technology co-produce agility and legitimacy.

SESI PERFORMANCE AND PORTFOLIO DESIGN

Stanford reports substantial outcomes. SESI reduced campus GHG emissions by $\approx 68\%$ in its first year and cut potable-water use by $\approx 18\%$.¹⁰

As the renewable-electricity portfolio matured—culminating March 24, 2022, when Stanford completed its transition to 100% renewable electricity—official sources report $\approx 80\text{--}81\%$ Scope 1–2 reductions from peak (reported as 80% in the 2025 Stanford Report and 81% on the SESI Impact page).¹¹

Portfolio design is governance: PPAs, hedge structure, and matching shape not only carbon intensity but who bears volatility and who captures savings. Under CDR, due diligence includes exposure by constituency and host-community effects, reported alongside climate metrics.

INSTITUTIONAL ARCHITECTURE: DOERR SCHOOL AND SUSTAINABILITY ACCELERATOR

The Stanford Doerr School of Sustainability (opened Sept. 1, 2022) consolidates institutes and departments and houses a Sustainability Accelerator that translates research into policy and market solutions. This structure operationalizes IMSD's policy/partnership/monitoring pillars and creates repeatable sites for DLM practice—coalition building, negotiation, indicator design, and iterative delivery.¹²

IMSD Pillar	CDR Guardrails (equity as decision filter)	DLM Capabilities (execution)	Indicative Metrics
1. Climate-positive infrastructure	Thermal-comfort distribution; outage exposure; affordability/volatility screens	Digital imagination; facilities-academia-students coalition	Campus GHG intensity; DCI; CSR*
2. Social sustainability via CDR	Representation of affected groups; transparency cadence; no-go criteria	Facilitation and negotiation routines; escalation paths	Participation Equity; Transparency Fidelity
3. Policy/regulatory integration	Public reasoning about trade-offs; conflict-of-interest guardrails	Intergovernmental coalition-building; regulatory fluency	Policy adoption latency; compliance without drift
4. Partnerships	Host-community co-benefits; fair gain/risk distribution in PPAs	Partner selection and governance; dispute resolution	PPA volatility exposure by constituency; partner satisfaction
5. Implementation / monitoring	Equity KPIs co-reported with environmental KPIs	Iteration cadence; post-implementation learning	Decision Latency; Implementation Tempo; Iteration Health

Table 1. IMSD×CDR×DLM operating model for HEIs

Gate	Key Actions	Equity Outputs
0 Concept	State distributional hypotheses; identify vulnerable groups; define no-go criteria	Preliminary exposure map; public no-go list
1 Feasibility	Quantify exposure; simulate thermal safety and rate impacts under stress	Scenario workbook with unit-level impacts
2 Design	Co-design with affected groups; test alternatives that reduce variance for least-resourced users	Selected option with lower exposure variance
3 Procurement	Evaluate suppliers/PPAs on carbon, reliability, and fairness	Supplier/portfolio shortlist with equity scores
4 Commissioning	Verify distributional outcomes; set transparency cadence	Commissioning report with equity verification
5 Operations	Publish dashboards for carbon, water, equity KPIs, reliability; trigger corrective actions	Live dashboard and action log

Table 2. CDR stage-gate equity screen (concept→operations)

PORTFOLIO GOVERNANCE: PROCUREMENT AS EQUITY

Procurement is governance. Under CDR, portfolios are assessed not only on carbon and reliability but on exposure distribution: who bears price volatility and outage risk, and what co-benefits or burdens accrue to host communities. We propose a dominance rule: a portfolio is dominated if an alternative achieves equal-or-better climate/reliability outcomes with lower equity exposure.¹³

To make equity auditable, HEIs can co-report climate, reliability, and equity KPIs; publish versioned scenario workbooks used at stage-gates; and run periodic transparency sprints that reconcile internal logs with public dashboards.

DATA ARCHITECTURE AND TRANSPARENCY

Accelerator pilots can be framed as governance exercises: selection criteria, learning objectives, and distributional impacts are specified in advance and summarized at close-out.¹⁴

PEDAGOGY 2025: GOVERNANCE AS LABORATORY SCIENCE

For Pedagogy 2025, the didactic shift is to treat governance design as laboratory work. Interdisciplinary studios use SESI and the educational-farm microgrid case to map decisions to IMSD pillars, run equity diagnostics (comfort, affordability, critical loads), and redesign stage-gates and dashboards. Modules cover thermo-governance, portfolio ethics (just procurement), and coalition practice (stakeholder mapping and negotiation).

STRESS-TESTING CAMPUS RESILIENCE: SCENARIOS AND EQUITY

Because HEIs are multi-hazard environments, stress testing is core governance. We frame four Stanford-relevant scenarios and show how CDR-constrained choices alter the response.

Scenario 0: Outage / islanding—students use a site-level microgrid case (Educational Farm) to set ‘critical load’ priorities and equity rules under scarcity.¹⁵

Scenario 1: Heatwave and Peak Demand—Elevated cooling loads threaten comfort and reliability. Levers: recovery upshift; TES pre-charge; predictive control. CDR guardrail: prioritize vulnerable cohorts (residence halls; childcare; accessible study spaces); disclose rationale in near-real time. KPIs: DCI; CSR*.

Scenario 2: Grid Price Spike / Volatility—Extreme weather or market constraints induce price spikes. Levers: demand flexibility; storage arbitrage; re-scheduling. CDR guardrail: limit pass-through to sensitive units; report AVI and hedge performance by constituency.

Scenario 3: Wildfire Smoke / Air Quality—Filtration demand and occupancy shifts increase. Levers: hydronic re-balancing; temporary setpoint changes; filtration upgrades. CDR guardrail: guarantee safe indoor air access for all; prioritize health-sensitive users and essential services.

Abbreviations: DCI = Distributional Comfort Index; CSR* = Critical Services Resilience; AVI = Affordability/Volatility Index; PE = Participation Equity; TF = Transparency Fidelity.

Scenario	Technical Levers	CDR Guardrail	Primary KPIs
Outage / islanding (microgrid)	Microgrid dispatch; storage; load shedding; critical-load sequencing	Publish critical-load priorities; protect vulnerable groups and essential services	CSR*; TF; PE
Heatwave peak	TES pre-charge; recovery upshift; predictive control	Prioritize vulnerable cohorts; publish dispatch rationale	DCI; CSR*
Price spike	Demand response; storage arbitrage; re-scheduling	Cap pass-through to sensitive units; report AVI	AVI; TF
Air-quality event	Filtration upgrades; hydronic re-balancing	Guarantee safe indoor air access; equitable rotation	DCI; PE

Table 3. Resilience scenario matrix (technical × CDR × KPIs)

Audit Trail	What to Track	Why it Matters
Decision Latency	Time from concept to authorization	Reveals bottlenecks; links leadership development to tempo
Implementation Tempo	Planned vs. actual milestone burn-down	Assesses delivery capacity, not just planning quality
Coalition Density	Cross-unit/external ties per project	Tests whether leadership is boundary-spanning
Iteration Health	Pilots launched; scaled; abandoned	Rewards learning speed and transparent decision criteria

Table 4. DLM audit trails (turning leadership into evidence)

DISCUSSION: REPLICABILITY, SCOPE, AND LIMITS

Stanford is unusually resourced, but what travels is the IMSD×CDR×DLM alignment: equity as a binding filter, pillars mapped to governance bodies, and capability metrics that reward coalition-based delivery. The building blocks (heat recovery, hydronics, storage, PPAs) exist elsewhere; integration and transparency are the differentiators.

In parallel, the Erasmus+ ST3AM project’s WP3 uses CDR as a guiding principle for gender-sensitive STEM pedagogy and HEI governance tools (KPI ownership and equity-by-design checklists), illustrating European transferability.¹⁶

LIMITATIONS AND RESEARCH AGENDA

This is a single-case, theory-to-practice analysis; we make analytic, not statistical, generalizations. Future research should compare HEIs using quasi-experimental or longitudinal designs, tracking decision latency, implementation tempo, and distributional outcomes before/after reforms across different contexts.

CONCLUSION

HEIs catalyze systemic change when equity is integral to strategy, architecture, and execution. CDR provides the fairness doctrine, IMSD embeds it structurally, and DLM makes it executable. Stanford shows that significant gains ($\approx 68\%$ year-one GHG reduction; $\approx 80\text{--}81\%$ from peak with 100% renewable electricity; $\approx 18\%$ water savings) are achievable when infrastructure, procurement, and governance are treated as one pedagogical system. For Pedagogy 2025, the lesson is practical: use real campus systems to teach decision-making under uncertainty with equity as an ex-ante constraint.

NOTES

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3. The IMSD, CDR, and DLM frameworks are applied by the authors ex post as analytical lenses; Stanford University did not employ them in internal decision-making for SESI or the Doerr School.
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SUPPORTING STUDENT-TEACHERS IN COLLABORATING WITH CHATGPT ON CULTURALLY SUSTAINING EARLY CHILDHOOD LESSON PLANS

Author:

HUI WEN CHIN

Affiliation:

SINGAPORE UNIVERSITY OF SOCIAL SCIENCES, SINGAPORE

INTRODUCTION

Large language models (LLMs) like ChatGPT have great potential as educational tools. They can strengthen teacher efficiency and efficacy in lesson planning.¹ Still, tools such as ChatGPT do not provide contextual information relating to specific children or nuanced cultural perspectives.² So, even when supported by generative artificial intelligence (AI), teachers need to augment materials and choose concepts applicable to their unique environment. Only then can they develop culturally sustaining lesson plans, which honour cultural identities and support cultural competence.³

Teacher training programs play a critical role in helping student-teachers develop the skills to refine ChatGPT outputs.⁴ Thus, as a teacher-educator at a university in Singapore, I asked the question: How can I offer assignments that aid preschool teachers in collaborating with ChatGPT on culturally sustaining lesson plans? Further investigation into ChatGPT is especially relevant in Singapore's educational context, where policy makers,⁵ teachers,⁶ and professors,⁷ are all keen to properly leverage the tool in classrooms. To respond to the research question, this paper draws on data from an undergraduate early childhood education (ECE) elective course, ECE370 Introduction to Edible Education for Children.

The Assignment

In January 2025, I offered an end-of-semester assignment for the elective ECE370 Introduction to Edible Education, which required students' use of ChatGPT. ECE370 is a course that supports preschool teachers in facilitating young children's learning through the medium of food (e.g., experiences growing, cooking and eating food). I extended this assignment to 59 student-teachers enrolled in the class.

Broadly, the assignment included the following instructions: (a) develop a prompt to "feed" into ChatGPT to generate a lesson plan; (b) edit, adapt and re-write that lesson plan to suit your (i.e., the student-teacher's) context, culture and community; and (c) reflect on and explain the changes. The generated lesson plans generally focused on cooking activities or growing fresh produce in school gardens.

LITERATURE REVIEW

Generative AI for assignments

Going into this project, I recognized that misuse of ChatGPT for plagiarism was a distinct concern among university faculty.⁸ However, the extant literature also indicated that, with the appropriate strategies, instructors may design assessments where students disclose their use of ChatGPT and collaborate with generative AI ethically.⁹ To illustrate, assignments may ask student-teachers to use ChatGPT-created lesson plans as early drafts. These can then be refined and adapted by human educators to suit their needs. As pre-service teachers become more skilled in designing ChatGPT-based lesson plans, their focus shifts from just presenting lesson plans to the higher order skills of evaluating and refining AI-generated lesson plans.¹⁰

Generative AI for lesson planning

Human input remains key to enhancing AI responses as ChatGPT and other LLMs also have significant limitations. They have been criticized for biased responses,¹¹ and can provide inaccurate information.¹² Additionally, AI-generated lessons tend to be standalone units, as AI lacks the human ability to integrate prior lessons with current learning experiences to prepare students for the future.¹³ Moreover, ChatGPT cannot provide contextual information relating to specific children or nuanced cultural perspectives,¹⁴ which is important in ECE.

Without appropriate guidance and practice, collaborating with AI on lesson plans can be challenging. Due to the errors that can arise from the use of AI tools, as well as the novelty of technology,¹⁵ teachers should be trained to maximize its effectiveness.¹⁶ Educators need content, professional, and prompt engineering skills.¹⁷ These enable them to leverage ChatGPT's full potential to enhance their educational practices.¹⁸

Effective prompt engineering

Of the skills required for educator-AI collaboration, prompt engineering (i.e., the process of writing, refining, and optimizing prompts) is especially vital.¹⁹ To craft an effective prompt, educators must know the material they would like to cover and use precise instructions and vocabulary.²⁰ They should be taught practical strategies for prompt engineering like using the PARTS framework.²¹

PARTS refers to including Persona, Aim, Recipients, Theme, and Structure in one's prompt. Essentially, when using ChatGPT to generate a preschool lesson plan, explaining the Persona means defining the role of the user inputting the prompt (e.g., "I am a Kindergarten One teacher working at private preschool in Singapore"). The Aim is the goal of the prompt (e.g., "Create a lesson plan"). The Recipients are the audience (e.g., "for 5-year-old children from Chinese, Indian and Malay ethnic backgrounds"). The Theme (sometimes called task) refers to aspects like boundaries and restrictions (e.g., "the lesson plan should not be more than 900 words"). Structure (or style) refers to the format (e.g., "present the lesson plan in a table format" or "teach through a cooking activity"). All of this comes together to create an effective prompt. Knowledge of simple prompt engineering frameworks like PARTS may now be essential to preschool teachers. After all, going beyond awareness of AI related terminologies, those working in early childhood education must today be able to integrate generative AI with diverse knowledge and practices.²²

METHODS

I generated data for this study through document review. I analyzed: (a) the assignment question paper; (b) ChatGPT-generated lesson plans and student responses; as well as (c) my own field notes and analytic memos. To analyze the data, I assigned labels to data units through process coding. Researchers often code observable or conceptual actions as process codes.²³ And in this study, I coded

the edits or alterations students made to their AI-generated lesson plans, as well as my own actions as the course developer and instructor. I condensed the data into 54 codes and developed a codebook. I then clustered the codes into nine categories. Following that, five recurring themes emerged responding to my research question.

THEMES

The five themes that emerged were: (a) changing in expected ways; (b) prompting; (c) taking unexpected action; (d) detailing; and (e) missing. The first three themes described student edits (i.e., how they changed the lesson plans). The latter two themes described my actions as the course writer and teacher-educator.

Changing in expected ways

The theme changing in expected ways encompassed any observable or conceptual changes student-teachers made to their ChatGPT-generated lesson plans, which I had anticipated.

Observable changes

Observable changes that I expected the students to make included steps like localizing the recipes in their lesson plans. For instance, one student localized the generic recipe for “magic muffins” featured in her ChatGPT-created lesson plan. She added the Southeast Asian herb pandan to the muffin recipe. She explained, “Pandan was an obvious choice as it is a plant found in our school garden.” Another student lamented that her ChatGPT-generated lesson plan featured a fruit salad “utilizing conventional fruits such as apples and pears.” She explained that she tried “changing the direction to allow the use of local, Southeast Asian fruits (e.g., mango, papaya)”, thus also localizing the fruit salad recipe. As the extant literature indicated, ChatGPT cannot provide contextual information relating to specific cultures.²⁴ ChatGPT did not evince a nuanced understanding of Singaporean cuisine. So, including the local ingredients was a logical and predicted approach to aligning the cooking experience described in the lesson plan to the student-teachers’ cultures and contexts.

Conceptual changes

Conceptual changes (which I anticipated students would make to their ChatGPT-generated lesson plans) included considering personal values and ideals, taking into account research, differentiating instruction and improving flow. These explained “why” the observable changes were made. For example, a student shared that she considered her personal values of “responsibility” and “ownership” and thus decided to add extra steps to her lesson plan. While her ChatGPT-created plan directed teachers to simply distribute pre-cut vegetables to the children as they observed the teacher making a vegetable curry, the student-teacher “expanded the children’s roles to include measuring water, adding ingredients, cutting vegetables and stirring the pot instead of only observing.” She explained, “This deeper involvement not only builds skills but strengthens children’s connection to food preparation and respect for the cooking process.” This act of reasoning—using one’s values as a basis—was a step I hoped and expected the student-teachers would take as I designed the original assignment.

Prompting

The theme described as prompting referred to all the information the student-teachers entered in ChatGPT to generate their lesson plans. Students tried prompting with concrete elements like time (e.g., a duration of 50 minutes), location (e.g., in Singapore), activity type (e.g., a cooking activity), number of children (e.g., for 10 children), as well as more abstract ideas such as culture (e.g., ethnic cultures) and ideals (e.g., guided by Slow Food values).

Taking unexpected action

The theme taking unexpected action described instances when the students behaved in ways that surprised me. Some of these actions were misaligned with the aims of the assignment. For instance, rather than crafting their own prompts, some learners copied and pasted the entire assignment question into ChatGPT as a prompt. This action was counter to the purpose of the assignment. I wanted students to develop competencies in prompt engineering.

Detailing

The theme of detailing identified the specific instructions I included in the assignment question paper. This could include articulating key elements expected in the assignment responses and providing examples of those key elements. For instance, an assignment question stated that the lesson plan had to relate to “national curriculum frameworks (either the Early Years Development Framework; EYDF or Nurturing Early Learners; NEL), edible education standards, principles and values, children’s passions, interests and goals, and/or current research on Singapore children’s health and educational needs.” Furthermore, it stipulated that “expected learning outcome(s)” and “materials required” should be included. Examples of “materials required” were also provided in the question (i.e., “food items/crops, visual aids/photographs and written recipes”).

Missing

The theme missing referred to all parts of assignment questions that I left open to interpretation, and for which I did not offer comprehensive instructions. For example, my invitation for the students to generate a prompt to feed into ChatGPT was vague. It simply said, “Use ChatGPT to draft ONE (1) edible education experience plan for young children. Share the prompt that you ‘fed’ into the AI model to generate the edible education experience plan. Briefly describe how you composed an effective prompt.” It included no key elements and offered no examples.

FINDINGS

In connecting themes with the extant literature, the following findings were identified to address the overarching research question: (a) including definitions and examples; (b) providing guidance on both prompts and lesson plans; and (c) focusing more on conceptual than observable changes.

Including definitions and examples

The first finding is that including definitions and examples in the question paper helps student-teachers provide more relevant and detailed lesson plans while working with ChatGPT. When I defined local curricular frameworks as the NEL or EYDF, students made sure to refer to the actual frameworks when crafting their learning objectives. They cited specific goals, domains and sub-outcomes. For instance, one lesson plan (on making banana bread) said, “This connects with Numeracy Learning Goal 1: Enjoy learning and using numeracy concepts and skills in daily experiences. And specifically links to Sub-Outcome 1.1: Children will develop an awareness of how numeracy ideas and processes are useful in their daily life—through counting the number of bananas and eggs they will need as well as pouring the desired volume of milk needed for the recipe—from the NEL.”

When I included examples of lesson “materials” in the question paper, student-teachers made sure to fill in any missing visual aids not included by ChatGPT. For example, a student included a visual recipe for the dumplings she planned to make with the children in her class (as illustrated in Figure 1).



Figure 1. Visual recipe for dumplings.

However, where definitions and examples were absent, students gave unexpected responses misaligned with the assignment goals. For instance, I did not explain what collaborating with generative AI meant. As part of the university efforts to support academic honesty, students had to fill out a cover sheet with a declaration of whether they used generative AI for their assignment. Typically, students use the form to declare use of tools like Grammarly. Given that collaboration with AI was required for the assignment, I assumed that all students would declare “I have” used AI for the assignment. Yet, out of the 59 students in the course, eight declared “I have not” used AI for the assignment. When I asked the students about the reasons for their response, they generally said, “I thought since it was part of the question, it is not counted.” I realized that my question paper was in many ways ambiguous about key terms. As a clear and transparent academic honesty policy is key to effective AI assignments,²⁵ including a definition and examples of AI use and collaboration could have reduced confusion.

Providing guidance on both prompts and lesson plans

The second finding was that providing just as much guidance on prompt engineering as the actual lesson plan may enhance teacher efficiency in collaborating with generative AI. In the assignment question paper, I had articulated what to include in the final lesson plan but neglected to explain how to craft a useful prompt. Prompting ChatGPT, using elements included in the PARTS framework, was a real time-saver. Students who happened to do so enabled the AI tool to draft lesson plans needing few later updates. But as I did not provide explicit guidance on engineering prompts, not all students knew what to include. Some took unexpected actions, which were not well targeted at developing an appropriate draft lesson plan.

For instance, one student-teacher only detailed only Persona and Aim but not the children she worked with (i.e., Recipients), restrictions (i.e., Theme) and the desired activity format (i.e., Structure) in her prompt for ChatGPT. The learner wrote, “You are a university student who is studying for a bachelor’s in early childhood education. You are now studying a module called Introduction to Edible Education for Children. As part of your assignment, you are to draft 1 edible education experience plan for young children.” Without any details about the children in her class (e.g., their ages, dietary preferences) or the school limitations (e.g., 30-minute class periods, no on-site oven), this generated a short and vague lesson plan about planting an unspecified seed. It was limited in its usefulness.

I had assumed the student would have highlighted a more pertinent aspect of her Persona (e.g., explaining that she was “a student-teacher who works with a Kindergarten One class” rather than “a university student”). I had also assumed that she would have noted the Structure of her experience (e.g., “through the experience of planting, caring for and harvesting water spinach”). But without guidance on prompt engineering, this was not the case. Student-teachers, in the Singapore context, generally followed instructions. But if guidance on prompt generation was insufficient, they took some unexpected actions and did not develop the desired professional competencies needed to access the benefits of generative AI.

Focusing more on conceptual than observable changes

The third finding was that it was more helpful to assess the conceptual reasons student-teachers had for the changing their lesson plans rather than the observable changes manifested in the polished or refined lesson plans. As I analyzed the student responses, I realized that most of the codes I used to label elements of their refined lesson plans were observable changes (e.g., adding questions, augmenting time). These codes were often repeated in their reflection write-ups about the changes. So, analyzing the refined lesson plans was repetitive and redundant. The reflections were far richer texts. They included rationales for the changes and tended to include both observable and conceptual changes (e.g., considering values and ideals, taking into account research).

Observable changes alone were not very useful in assessing the student-teachers’ competencies in collaborating with AI. For instance, some students made the observable change of “adding questions” (to ask children) to their lesson plan just because the question paper suggested it while other students added questions due to their own values and ideals, because they were taking into account research, or to apply theory (e.g., constructivism) in practice. Conceptual changes in the reflections explained why the edits were made, illustrating the higher order skills of evaluating and refining AI-generated lesson plans.

THE UPDATED ASSIGNMENT

Drawing on these findings, I updated the ECE370 assignment for the January 2026 semester. In the new assignment, I provided guidance on prompt engineering by suggesting that students leverage frameworks like PARTS. And rather than instructing students to rewrite their entire ChatGPT-drafted lesson plans, I ask them to propose, reflect on and explain possible changes. The new instructions read as follows: (a) develop a prompt to “feed” into ChatGPT to generate a lesson plan; (b) propose changes to improve the lesson plan for your (i.e., the student-teacher’s) context, culture and community; and (c) reflect on and explain the changes.

CONCLUSION

In summary, this study reveals how by offering assignments that include definitions and examples, providing guidance on both prompts and lesson plans, and focusing more on the conceptual than observable changes (made to update the lesson plans), instructors can support student-teachers in developing lesson plans suitable for their specific cultural contexts with ChatGPT.

It suggests that if student-teachers are offered assignments providing appropriate support, they can be highly effective in adapting lesson plans for the populations they work with. Ultimately, inviting reflection on and critique of any ChatGPT-generated lesson plan may be more helpful in assessing learning than seeing a “completed” or polished lesson plan. When aiding students in collaborating with generative AI for assignments, instructors should focus on the process of planning over final outputs.

NOTES

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SLOW PEDAGOGY FOR ELEARNING: RESISTING THE BUSYNESS REGIME IN UK HIGHER EDUCATION

Author:

SABINE SHARP

Affiliation:

UNIVERSITY OF MANCHESTER, UNITED KINGDOM

INTRODUCTION

In a keynote speech delivered at DigiFest 2025, a UK digital education conference, Sana Khareghani, former head of the UK Government's Office for AI, posed her audience a question: How will we use the productivity gains afforded by AI? In other words, what will we do with the time we save? The question troubled me, not only because reducing the workweek was not an option on the table. The idea that AI tools might finally offer us the Keynesian promise of more time to spend on relaxation, recreation, and caring responsibilities sadly remains unthinkable to many.¹ What concerned me more, however, was the realization that education leaders continue to be enthralled by rhetorics of endless economic growth and pedagogy in service of profit-maximization.

In this paper, I examine how eLearning is implicated in the neoliberal logics that hold such sway over higher education. While the use of technology for educational purposes might at first seem politically neutral, eLearning—certainly in the UK context—presents what Robin Goodfellow and Mary R. Lea describe as a “technological agenda,” a cog within the machine of a broader neoliberal framework.² Since the 1990s, eLearning has surpassed the production of downloadable and web-based learning materials, also extending to the inclusion of technologies in classroom settings to enable and enhance learner engagement and the use of virtual conferencing tools to facilitate remote learning. Today, eLearning involves the use of technology not just to support learning (and sometimes indeed to hinder it), but to assess outcomes, monitor learners, and reproduce the conditions of marketized education.³

I argue that to resist this relationship between eLearning and the neoliberal university, we might learn from a growing body of work adapting ideas from the slow movement for education: slow pedagogy. As yet, there is scant literature on slow pedagogy in relation to eLearning, though the broader field of critical digital pedagogy has long challenged assumptions about speed and efficiency in relation to online and digitally enabled teaching and learning.⁴ Contributing to critical digital pedagogy's interventions, I make the case here that eLearning can offer radical possibilities for extending slow pedagogy.

THE BUSYNESS REGIME

With this turn to slow, I draw attention to what Maggie Berg and Barbara K. Seeber, authors of *The Slow Professor* (2016), have termed “the culture of speed”, building on Carl Honoré's idea of the “cult of speed”, from his book *In Praise of Slow* (2004). With this shift from “cult” to “culture,” Berg and Seeber subvert the business-oriented language of “workplace culture” that has seeped into

discussions of academic life. In this paper, however, I refer to higher education's "busyness regime", noting that, within certain spheres of the university the emphasis lies not always on achieving things quickly but on seeming to be busy, with the use of strict schedules, tight deadlines, and calendar monitoring as techniques of workplace discipline. This is the kind of corporate make-work that anthropologist David Graeber has identified as characterizing contemporary capitalism.⁵ With my use of "busyness," I intend to echo Berg and Seeber in foregrounding ways in which higher education now functions as a business. Moreover, with the term "regime," I gesture towards the Foucauldian ideas of disciplined bodies and governmentality that Yvonne Hartman and Sandy Darab have adopted to analyze the university under capitalism.⁶ My framing of higher education as a "busyness regime" is purposeful, directing us to think about eLearning in relation to power.

Neoliberalisation

The rise of eLearning in British higher education must be understood in the context of the changing landscape of higher education more broadly. Writing in the mid-2000s, Goodfellow and Lea identified "a rapid growth in appointments to posts within universities which have been designed to promote e-learning and the use of technologies across the curriculum" in the UK higher education system.⁷ This growth in institutional eLearning jobs followed the implementation of recommendations from the 1997 National Committee of Inquiry into Higher Education, also referred to as the Dearing Report. Alongside this development, HEIs have seen the introduction of tuition fees for home students in England and Wales in 1998, raised in 2004 and again in 2012. Moreover, over the past three decades, UK higher education has moved from a local to global market, with some institutions securing significant proportions of their income from international student fees.⁸

These changes to the funding structure of universities have not simply unfolded in parallel with the increased technologization of teaching: neoliberal logics have seeped into the ways we teach. As Hartman and Darab and Tony Harland have noted, universities have increasingly followed the model of the private sector, buying into ideas of academia as a competitive marketplace rather than an intellectual community.⁹ Alongside their contributions, a slew of papers have invoked slow pedagogy or scholarship to examine different dimensions of the marketization of higher education, from alienating micromanagement,¹⁰ an audit culture,¹¹ the devaluation of teaching,¹² an overemphasis on employability,¹³ creeping adminification,¹⁴ the counting imperative,¹⁵ and the worsening quality of student feedback.¹⁶ Slow pedagogy offers vital perspectives on these issues, as well as strategies to fight back.

SLOW PEDAGOGY

The Slow Movement began with "slow food." In Rome in 1986, locals resisted the opening of a new McDonalds, maintaining that this fast-food franchise was incompatible with the Italian relationship to food. This movement sought to celebrate local culinary and agricultural traditions, promoting high-quality ingredients, enjoyable eating experiences, and environmental sustainability. The Slow Movement has exploded, with a multitude of Slow initiatives.¹⁷ Though the range of slow initiatives now varies widely, they hold certain ideas in common, emphasizing care over convenience, depth over surface, and quality over quantity.

The literature on slow pedagogy and slow scholarship is expanding steadily, with new contributions often reflecting on experiences teaching during the COVID-19 pandemic,¹⁸ as well as the impact of generative AI tools.¹⁹ Nestled within a broader field of critical and radical pedagogies sparked by works such as Paolo Freire's *Pedagogy of the Oppressed* (1996) and bell hooks' *Teaching to Transgress* (1994), slow pedagogy sits alongside related projects of wild pedagogy and pedagogies of love, kindness, and place. Perhaps unsurprisingly research on slow pedagogy is dominated, on the one

hand, by writing on outdoor education, and on the other, by research in early years education.²⁰ Through decelerating the pace of activities, slow pedagogy emphasizes learning as embodied and social. Encouraging mindfulness of the experience of learning, slow pedagogy displaces expectations, shifting attention from the end-product of achieved learning outcomes or grades onto the process of navigating uncertainty through curiosity.

This focus on embodiment works well for in-person teaching. eLearning, meanwhile, is so often assumed to be disembodied—and to contribute to the very erosion of attention spans and deep learning that slow pedagogy is meant to challenge. Several researchers in slow pedagogy have expressed concern about technology-driven teaching that fails to challenge the underlying problems that cause poor engagement.²¹ Slow pedagogy has largely presented an opportunity to take a break from technology, reconnecting with what it means to learn by disconnecting from devices and screens.

ELEARNING AS SURVEILLANCE TECHNOLOGY

In many ways, eLearning appears simply antithetical to slow pedagogy, perhaps irrevocably contaminated by the busyness regime. Indeed, eLearning so often serves the interests of the neoliberal university, contributing to the demand for faster teaching and slimmed-down content.²² This is especially the case for units of online content that can be embedded within the university's central learning management systems and websites. The usage of these resources can be tracked to identify trends, check broken links, or flag resources for updating or retiring. Within courses, teaching staff can monitor completion rates and views, chasing up with students who miss targets for engaging with this digital content.

While institutions may comply with local laws and internal guidelines on data protection, these surveillance tools are derived from digital marketing, adopting similar methods to those used by big tech companies to observe learner journeys, extract attention, and nudge behavior.²³ This use of such behavioral techniques to track engagement reflects that eLearning within higher education is conditioned by wider industry norms.²⁴ In a business setting, eLearning is all about “delivery”: the efficient transmission of information, the immediate surveillance of employee performance and progression, and the increased productivity and efficiency of the workplace. This approach to eLearning adheres to what Freire refers to as the “banking model” of education, in which learners are vaults in which knowledge can be stored for later retrieval.²⁵ Learning becomes unidirectional, isolating, and dispiriting.

eLearning beyond education settings comprises corporate onboarding materials, mandatory training packs, and professional development monitoring systems. Click-through, tick-box, compliance courses are perhaps eLearning's most recognisable form, instantiating legal requirements or institutional policies. Compared with these online health and safety training or cybersecurity modules, the “learning environments” of certain administrative platforms tracking learner data might not at first appear as sites of eLearning: learners do not learn by interacting with them. However, administrative staff learn about learners; they are a crucial part of the wider eLearning ecosystem. While these two forms of eLearning must be understood as operating in tandem, I focus on asynchronous eLearning courses (AECs) here as they are the most explicit and visible example of the relationship between eLearning and power.

Economical activities

Much of the software for creating digital learning resources that is available to eLearning specialists—in higher education and elsewhere—is made for these corporate contexts. Online training guides are assumed to be quicker to prepare and share than in-person training and support.²⁶

Increasingly, the companies behind these tools stress how much time users will save in making teaching content, often now pushing generative AI tools that they have added to their products as ways to save time and effort in creating learning content.²⁷ My own work has introduced me to applications and platforms that are not built to facilitate analytical skills, critical thinking, or reflective practice. The out-of-the-box options do not make for pedagogically sound teaching of higher-order skills.

So called “knowledge check” activities, like quizzes or matching puzzles, think only about rote learning of definitions and facts to check that learners have progressed through content. eLearning software companies might advertise that their products allow for interactivity, but their conception of “interactive” can mean only that users can insert clickable buttons for learners to open content (rather than scrolling through a page of text), not that the learner is able to interact with others or contribute to shaping the course. Alternatively, eLearning software may enable users to create roleplaying scenarios, but these are often limited to fixed responses, with no way for users to challenge assumptions or share insights from their own personal experience. To enable open-ended or long-form responses, you must build your own activities, which takes considerable time and effort.

ADAPTING SLOW PEDAGOGY FOR ELEARNING

Given these problems, it is understandable that the literature on slow pedagogy has rarely engaged with digital learning. Where it has, often the focus is on blended²⁸ or synchronous online teaching.²⁹ This consists, on the one hand, of contexts where software or technology is incorporated into the in-person classroom, or, on the other, where the instructor and learners share a virtual space simultaneously, as in online teaching via video call software. Slow pedagogy in this context thinks about responsiveness, sharing feedback, and ways to build movement and dedicated breaks into sessions to help learners maintain focus.

While there is little existing literature offering slow pedagogical approaches to AECs, there is much to gain from adapting slow pedagogy’s insights to this context—and in fact eLearning resources may offer some advantages over in-person teaching.

Removing performance pressure

Asynchronous eLearning removes the pressure to perform. As many educators discovered during the COVID-19 pandemic, learners can feel exposed and under surveillance in classroom settings.³⁰ Uncomfortable with being on camera, often in highly personal spaces, many students opted to turn their video off. While in-person classroom settings do not risk the same invasion of privacy, they nonetheless demand a certain degree of performance, with students having to project a socially appropriate version of themselves. Especially for neurodivergent students, asynchronous eLearning can allow learners to participate and even take greater risks without worrying about others’ perceptions of them. eLearning can allow learners to attend to their own personal study strategies and approaches, which may include physical and vocal stimming.

Autonomy over pace

eLearning offers autonomy over the pace and timing of learning. Slow pedagogy and slow scholarship stress the value of going at your own pace: a common refrain in the literature is that the “slow” in slow pedagogy does not necessarily mean going slowly, but rather thinking more deliberately about the speed of leaning, and having the freedom to decide how swiftly to change topics.³¹ It does not mean never going fast but going fast when it suits you.

In combination with the reduction in performance pressure, AECs can allow for more relaxed learning. Without the time-pressures of a classroom or meeting, where another group may require the

physical space after you, or you need to accommodate the schedules of several people, asynchronous eLearning can allow learners to take as long or as little as they want exploring a topic. This might mean taking breaks when needed and skipping ahead or back to the content that is most relevant to them.

SLOW INTERVENTIONS

Through the lens of the busyness regime, asynchronous eLearning is often seen as enabling learners to be more productive, to extract information more quickly and attain learning outcomes sooner: AECs can be neatly sandwiched between other tasks or used to fill empty moments of the day like commutes on public transport. Instead, taking a slow pedagogical approach might mean we impress on learners the idea of this format as supporting them in developing independence in a field of study, moving more intentionally through a topic, and taking time to hone a skill.

Counterintuitively, eLearning could even present mechanisms for directing attention back onto embodiment, returning learners to the present moment. Alongside reminders to pause, slow down, and reflect, we might introduce prompts in our AECs to disengage from digital devices, turning to analogue methods that necessarily slow learners down so that they have time to think. It might also mean encouraging learners to acknowledge where they are learning and consider ways to adjust their learning environment where possible: reducing background noise; removing distractions like mobile phones or gaming devices; or potentially switching to a more appropriate location, like physical library spaces. Reminding learners that all learning is embodied supports them to intervene in and improve their own learning experience.

The risks of slow

Slow pedagogy does, however, pose some stubborn obstacles for eLearning. While autonomy is important, learners are not always pedagogic experts and may be affected by forms of cognitive bias. Learners can struggle to know when spending time on a topic has lapsed into procrastination. They might skim through a topic assuming they already know it, when they have in fact misunderstood a key idea. Without the external accountability of a classroom setting, learners may avoid working on certain skills because they generate anxiety. We need to ensure that eLearning produces opportunities for bravery, pushing through discomfort, and checking in with others to assess our understanding.

There is also the risk of slow pedagogy being co-opted by the busyness regime of UK higher education: Slow can become a way to fold productivity back in, with the seductive idea of learners becoming more resilient or efficient in the long run.³² As Harland points out, the actual subversiveness of slow pedagogy and slow scholarship may be limited, because these are areas of higher education easily understood by university management as demanding time and space to produce results.³³ It would be easy for universities to celebrate slow pedagogy initiatives without making any actual changes to workloads, contracts, or metrics of success.

CONCLUSION

Today, colleges and universities are likely inextricably enmeshed in neoliberal ideologies of productivity and efficiency, with no sign of turning back. Yet this is a time when we most need alternatives. As Kate Schick and Claire Timperley argue, shifting to slow is an urgent matter.³⁴ The collective authors of the 2015 essay “For Slow Scholarship” note that staff are under intense physical and emotional pressures in higher education.³⁵ Likewise, Émilie Dionne highlights the detrimental impact higher education institutions have on university workers’ bodies and minds, with health conditions caused or amplified by stress, and concomitant effects on social and family lives.³⁶ The busyness regime comes at a high cost, paid for with our bodies and minds.

Moreover, we as educators and our students face “multiple pandemics”: public health crises, the imminent collapse of interconnected environmental systems, heightening geopolitical tensions and conflicts, violent systemic racism, and growing wealth disparities, to name just a few.³⁷ We need both to prepare learners for the inevitable societal shifts and environmental catastrophes that will characterize their futures, but also to empower them to mitigate the worst of what lies ahead. As Greta Thunberg put it, “we are running out of time”.³⁸ When it comes to eLearning in higher education, we must rush to slow down.

NOTES

- ¹ David Graeber, *Bullshit Jobs: A Theory* (London: Penguin, 2019), XIV-XV.
- ² Mary R. Lea, "Approaches to Learning: Developing E-Learning Agendas," in *Challenging E-Learning in the University: A Literacies Perspective*, ed. Robin Goodfellow and Mary R. Lea (Maidenhead: Open University Press, 2007), 15.
- ³ Eamon Costello and Stephen Gow, "Authoritarian EdTech," *Dialogues on Digital Society* 1, no. 3 (December 2025): 304, <https://doi.org/10.1177/29768640251377165>.
- ⁴ Robin Goodfellow, "Learning Technologies in the University: From 'Tools for Learning' to 'Sites of Practice,'" in Goodfellow and Lea, *Challenging E-Learning in the University*, 44.
- ⁵ Graeber, *Bullshit Jobs*, XIV-XVI.
- ⁶ Yvonne Hartman and Sandy Darab, "A Call for Slow Scholarship: A Case Study on the Intensification of Academic Life and Its Implications for Pedagogy," *Review of Education, Pedagogy and Cultural Studies* 34, no. 1/2 (2012): 51.
- ⁷ Goodfellow and Lea, *Challenging E-Learning in the University*, 11.
- ⁸ Goodfellow and Lea, *Challenging E-Learning in the University*, 14.
- ⁹ Hartman and Darab, "A Call for Slow Scholarship," 52; Tony Harland, "Deliberate Subversion of Time: Slow Scholarship and Learning Through Research," in *Educating the Deliberate Professional: Preparing for Future Practices*, ed. Franziska Trede and Celina McEwen (Cham: Springer, 2016), 177, 178.
- ¹⁰ Kate Schick and Claire Timperley, "(Post)-Pandemic Subversive Pedagogies: Slowness, Relationality and Care," *Journal of International Political Theory* 20, no. 3 (2024): 222.
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- ¹² Harland, "Deliberate Subversion of Time," 179.
- ¹³ Bryoni Trezise, Alexandra Tálamo, and Maria White, "How to Play in Slow Time: Embodying Creative Literacies in Digital Learning Environments," *Convergence* 29, no. 1 (February 2023): 62.
- ¹⁴ Tony Harland, *University Challenge: Critical Issues for Teaching and Learning* (London: Routledge, 2020), 62-79.
- ¹⁵ Mountz et al., "For Slow Scholarship: A Feminist Politics of Resistance through Collective Action in the Neoliberal University," *ACME: An International Journal for Critical Geographies* 14, no. 4 (December 2015): 1240-1243.
- ¹⁶ Joanne Ailwood and Margot Ford "Slow Pedagogies and Care-Full, Deep Learning in Preservice Teacher Education," in *Reimagining the Academy: Shifting Towards Kindness, Connection, and an Ethics of Care*, ed. Alison L. Black and Rachael Dwyer (Cham: Palgrave Macmillan, 2021), 165.
- ¹⁷ Carl Honoré, *In Praise of Slow: How a Worldwide Movement is Challenging the Cult of Speed* (London: Orion, 2004), 15-16; Peter A. Shaw, Bob Cole, and Jennifer L. Russell, "Determining Our Own Tempos: Exploring Slow Pedagogy, Curriculum, Assessment, and Professional Development," *To Improve the Academy: A Journal of Educational Development* 32, no. 1 (June 2013): 320-321, <https://doi.org/10.1002/j.2334-4822.2013.tb00713.x>.
- ¹⁸ Judy Battaglia, "Slow Media, Slow Time, and Slow Pedagogy in the Zeitgeist and Context of Multiple Pandemics," in *Slow Media: Sensibility, Process, and Technology*, ed. Mary P. Erickson (Lanham: Lexington 2025), 76; Frederic Fovet, "When Being Online Hinders the Act of Challenging Banking Model Pedagogy: Neo-Liberalism in Digital Higher Education," in *Critical Digital Pedagogy in Higher Education*, ed. Suzan Köseoğlu, George Veletsianos, and Chris Rowell (Athabasca: AU Press, 2023), 104; Maria V. Luna-Thomas and Enilda Romero-Hall, "La Clave: Culturally Relevant Pedagogy in Digital Praxis," in Köseoğlu, Veletsianos, and Rowell, *Critical Digital Pedagogy in Higher Education*, 153-154; Bradley Rink, "For Slow Teaching: Courageous and Compassionate Pedagogy in Times of Change," *South African Geographical Journal* 107, no. 4 (Oct 2025), 518; Schick and Timperley "(Post)-Pandemic Subversive Pedagogies," 219-220; Shan Simmonds, "Don't Let the Curriculum Become a Stranger! Embracing Slow Pedagogy to Engender a Curriculum as Lived," in *Re-thinking the Humanities Curriculum in the Time of COVID-19*, ed. Labby Ramrathan et al. (Pietermaritzburg: CSALL 2020), 23-26; Trezise, Tálamo, and White, "How to Play in Slow Time," 61-62.
- ¹⁹ Katlynnne Davis et al., "What Do We Mean By 'AI Literacy'? Tensions in Current Institutional Guidelines and Recommendations for a Slow, Reflective Future," *Programmatic Perspectives* 17, no. 1 (Spring 2026): 41-45; Yulu Hou, "What's the Rush? Temporality, Anxiety and the Pursuit of Immediacy with Generative AI," *Teaching in Higher Education*, October 13, 2025, 1-2, <https://doi.org/10.1080/13562517.2025.2571914>; Ya Ping Hsiao,

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²⁰ For writing on slow pedagogy in outdoor education, see: Phillip G. Payne and Brian Wattchow, "Slow Pedagogy and Placing Education in Post-Traditional Outdoor Education," *Australian Journal of Outdoor Education* 12, no. 1 (April 2008), 25-38, <https://doi.org/10.1007/BF03401021>; Phillip G. Payne and Brian Wattchow, "Phenomenological Deconstruction, Slow Pedagogy, and the Corporeal Turn in Wild Environmental/Outdoor Education," *Canadian Journal of Environmental Education*, 14 (2009), 16-32. For writing on slow pedagogy in early years education, see: Maja Haals Brosnan, Rhona Stallard, and Natasha O'Donnell, "Where are You Going?: Lessons Learned from Irish ECEC Educators' Intuitive Implementation of Slow Pedagogy during the COVID-19 Pandemic," *European Early Childhood Education Research Journal*, July 30, 2025, <https://doi-org.manchester.idm.oclc.org/10.1080/1350293X.2025.2532552>; Alison Clark, *Slow Knowledge and the Unhurried Child: Time for Slow Pedagogies in Early Childhood Education* (Abingdon, Oxon: Routledge, 2023); Kristín Dýrfjörð and Anna Magnea Hreinsdóttir, "Paving the Way for Slow Pedagogy: Leadership Lessons from Icelandic Preschools," *European Early Childhood Education Research Journal*, July 23, 2025, 1-16, <https://doi.org/10.1080/1350293X.2025.2523040>; Natasha O'Donnell et al., "Reconceptualising Time and Pace in Early Childhood Education: Situating Slow Pedagogy as Inclusive Post-Pandemic Pedagogical Practice," *European Early Childhood Education Research Journal*, April 7, 2026, <https://doi.org/10.1080/1350293X.2026.2645033>; Minsun Shin, "Against the Clock: Slow Pedagogy, Care, and Relational Time in the Early Years under Neoliberalism," *Contemporary Issues in Early Childhood*, August 4, 2025, <https://doi.org/10.1177/14639491251363260>.

²¹ Schick and Timperley, "(Post)-Pandemic Subversive Pedagogies", 220, 222; Shaw, Cole, and Russell, "Determining Our Own Tempos," 321-322.

²² Fovet, "When Being Online," 102-104; Hartman and Darab, "A Call for Slow Scholarship," 52; Hou, "What's the Rush?" 6-7.

²³ Abdullah Çiftçi "A Socio-Political Critique of Educational Technology and the Digital Reshaping of Pedagogy," *Educational Philosophy and Theory* 58, no. 1-2 (2026), 121-123, <https://doi.org/10.1080/00131857.2025.2562208>; Costello and Gow, "Authoritarian EdTech," 304; Ricky D'Andrea Crano, "A Pedagogy of the Inevitable," review of *Teaching with AI: A Practical Guide to a New Era of Human Learning*, by José Antonio Bowen and C. Edward Watson, *Critical AI* 3, no. 2 (2025), <https://doi.org/10.1215/2834703X-12095991>.

²⁴ Lee Skallerup Bessett, "Digital Redlining, Minimal Computing, and Equity," in Köseoğlu, Veletsianos, and Rowell, *Critical Digital Pedagogy in Higher Education*, 115-118; Costello and Gow, "Authoritarian EdTech," 303; Çiftçi "A Socio-Political Critique," 118.

²⁵ Paulo Freire, *Pedagogy of the Oppressed*, trans. Myra Bergman Ramos (London: Penguin, 1996).

²⁶ Fovet, "When Being Online," 101, 102.

²⁷ Costello and Gow, "Authoritarian EdTech," 304.

²⁸ Collett et al., "Incubating a Slow Pedagogy," 122-123; Fovet, "When Being Online," 97-98.

²⁹ Schick and Timperley, "(Post)-Pandemic Subversive Pedagogies," 224-225; Trezise, Tálamo, and White, "How to Play in Slow Time," 65-66.

³⁰ Skallerup Bessett "Digital Redlining, Minimal Computing, and Equity," 115-118.

³¹ Collett et al., "Incubating a Slow Pedagogy," 120, 130; Mountz et al., "For Slow Scholarship," 1248.

³² Émilie Dionne, "Slowing Down with Non-Human Matter: The Contribution of Feminist New Materialism to Slow Scholarship," in *Posthuman and Political Care Ethics for Reconfiguring Higher Education Pedagogies*, ed. Vivienne Bozalek, Michalinos Zembylas, and Joan Tronto (London: Routledge, 2020), 92.

³³ Harland, "Deliberate Subversion of Time," 181.

³⁴ Schick and Timperley, "(Post)-Pandemic Subversive Pedagogies," 222.

³⁵ Mountz et al., "For Slow Scholarship," 1245-1246.

³⁶ Dionne, "Slowing Down with Non-Human Matter," 92-93.

³⁷ Judy Battaglia, "Slow Media, Slow Time, and Slow Pedagogy," 75.

³⁸ NPR/TED Staff, "Greta Thunberg: Are We Running Out of Time to Save Our Planet?" *npr.org*. Last Modified June 7, 2019. <https://www.npr.org/2019/06/07/730383662/greta-thunberg-are-we-running-out-of-time-to-save-our-planet>.

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EXPLORING AI-ASSISTED CONVERSATION PRACTICE IN LANGUAGE LEARNING: A PILOT STUDY COMPARING CONVERSATIONAL AI ROLES

Author:

MICHAL MACINKA, ŠTĚPÁN HUBÁLOVSKÝ

Affiliation:

UNIVERSITY OF HRADEC KRÁLOVÉ, CZECH REPUBLIC

INTRODUCTION

The development of spoken proficiency remains one of the most challenging aspects of second language learning. Most second language students still struggle with spoken communication despite 40 years of language teaching development. In formal educational settings, students who experience speaking anxiety and who fear making mistakes and who have restricted chances for practice tend to stay silent and their ability to express themselves develops slowly.¹ Affective barriers have been extensively documented because they strongly determine how much learners will speak and how long they will study languages.²

Conversational artificial intelligence (AI) has become a useful solution for particular challenges which educational institutions face. Through their automated systems, AI-driven chatbots and speech-based agents provide learners with opportunities to practice spoken communication whenever they wish, beyond regular classroom settings and in environments which function as non-evaluative spaces.³ Multiple studies prove that conversational practice with AI assistance helps learners speak better while their anxiety decreases and their interest in learning foreign languages increases.⁴ Students prefer to use AI systems for language practice because they provide instant availability and their systems function as non-judgmental communication partners.⁵

However, existing research often treats conversational AI systems as relatively uniform instructional tools.⁶ Researchers assess the effectiveness of AI-assisted practice through their studies which focus on its general benefits instead of studying specific teaching methods that produce various educational results. The practice of conversation in second language acquisition helps learners develop three core skills which include accuracy and fluency and confidence in their abilities. These dimensions do not necessarily develop in parallel and respond differently to task design, interactional focus, and feedback mechanisms. Corrective feedback is typically associated with form-focused development and accuracy, whereas sustained meaning-focused interaction is more closely linked to gains in fluency.⁷

Despite these theoretical distinctions, relatively little empirical work has explored how conversational AI systems might be intentionally designed to emphasize different instructional functions through differentiated interaction roles.⁸ Emerging studies comparing feedback-rich and interaction-focused AI designs suggest that corrective feedback may enhance accuracy-oriented outcomes, while more naturalistic conversational interaction may better support fluency and willingness to communicate.

Such comparisons remain limited, particularly in mobile-assisted learning contexts and across different educational cultures.⁹

Affective variables such as foreign language anxiety and intrinsic motivation also play a central role in learners' engagement with speaking tasks.¹⁰ Several studies report reductions in anxiety and increases in motivation following AI-mediated practice, yet fewer investigations systematically combine affective measures with session-level performance data or examine these outcomes across cultural contexts.¹¹

From a design perspective, recent work has called for more principled and pedagogically informed uses of conversational AI in language education, emphasizing alignment between AI behavior and instructional objectives. Prior design-oriented research by the present author proposed an AI-orchestrated language learning platform that differentiates conversational roles to support adaptive goals such as accuracy-focused feedback and fluency-oriented interaction.¹² The present study builds on this design precedent by empirically examining such roles in practice.

Specifically, this pilot study compares two configurations of AI-assisted conversational practice within a mobile-assisted language learning application: an AI Coach providing real-time corrective feedback and an AI Partner simulating fluent interaction without direct correction. The study examines how these roles relate to changes in learners' foreign language classroom anxiety, intrinsic motivation, and session-based performance metrics.

Parallel trials conducted in Japan and the Czech Republic enable exploratory cross-contextual comparison and provide initial insight into how differentiated conversational AI roles may support complementary aspects of language learning.

METHODS

Participants

The study included 40 university students recruited from two educational sites in the Czech Republic and Japan. Participants were enrolled in language-related programs and represented lower-intermediate to intermediate proficiency levels. The pre-study questionnaire was completed by all participants, while the post-study questionnaire was completed by most participants with only minimal loss of study subjects.

The study sites used stratified randomization to assign participants to the two groups, which included the AI Coach group and the AI Partner group. Variation in baseline proficiency, prior AI experience, and linguistic background was retained to reflect authentic learning contexts.

Study Design

The study employed a between-subjects pilot design comparing two configurations of AI-assisted conversational practice. Participants interacted exclusively with one AI role throughout the intervention to avoid carryover effects.

The two conditions were defined as follows:

- **AI Coach:** an AI conversational agent providing real-time corrective feedback and performance-oriented insights, emphasizing form-focused support.
- **AI Partner:** an AI conversational agent simulating a fluent conversational interlocutor, prioritizing natural interaction and meaning-focused communication without explicit corrective feedback.

The short-term intervention was designed to assess feasibility and measurement coherence and exploratory outcome trends instead of establishing causal effects.

Instruments

Affective Measures

Two established self-report instruments were used to assess affective dimensions of language learning. The Foreign Language Classroom Anxiety Scale (FLCAS) was administered at pre- and post-test to measure speaking-related anxiety, with higher scores indicating greater anxiety.¹³ Intrinsic motivation was assessed using selected subscales of the Intrinsic Motivation Inventory (IMI), with mean scores representing overall motivation levels. Both instruments were administered digitally within the application environment.

Performance Measures

Session-based performance data were collected automatically during AI-mediated conversational interactions. Accuracy was operationalized using AI-based scoring of conversational output, while fluency was measured as speech rate (words per minute) derived from transcribed interaction. These metrics were recorded for each session, enabling longitudinal analysis of performance trends.

Procedure

The study began when researchers handed out pre-test questionnaires to participants while demonstrating the conversational AI system which matched their designated experimental group. The participants took part in multiple AI-driven dialogue sessions which used a mobile language learning app to create speaking activities through task instructions that required lengthy speaking responses. The participants finished their post-test questionnaires after they completed the last session of the study. The research team collected automatic performance data which tracked participant progress during the entire duration of the study.

Data Analysis

Descriptive and exploratory analyses appropriate for a pilot study were applied. Questionnaire data were summarized using means and standard deviations, and pre-to-post difference scores were used to examine changes over time. Effect size estimates were calculated to characterize the magnitude of observed changes.

Session-based performance data were analyzed longitudinally by estimating linear slopes for accuracy and fluency at the participant level and summarizing trends at the group level. All analyses were conducted using Python-based tools, with emphasis placed on observed patterns rather than inferential testing.

RESULTS

Sample and Data Completeness

The pilot study involved 40 participants who were tested at two different research locations. The study gathered pre-study questionnaires from all participants, while post-study data collection reached 38 participants, which showed only minor participant loss. The research team gathered session-level performance data throughout the intervention period, which resulted in multiple performance assessments for each participant. Minor differences in post-test availability between the AI Coach and AI Partner groups did not affect the balance between conditions. Overall, the dataset was sufficient for exploratory analysis of questionnaire outcomes and session-based performance trends.

Questionnaire Outcomes

Foreign Language Classroom Anxiety (FLCAS)

The two groups began their study with intense foreign language classroom anxiety which was measured through FLCAS scoring and resulted in higher pre-test scores for the AI Partner group (Table 1). The participants from both groups showed a decrease in their FLCAS scores after the intervention which showed that their anxiety levels had decreased.

Timepoint	Condition	n	FLCAS Mean (SD)	Min–Max
Pre	AI Coach	20	110.0 (20.4)	73.0–155.1
Pre	AI Partner	20	118.8 (19.6)	72.7–154.1
Post	AI Coach	18	95.7 (21.7)	59.8–141.1
Post	AI Partner	20	104.8 (25.4)	53.2–144.6

Table 1. Descriptive statistics for FLCAS scores by condition and timepoint (pre, post)

he FLCAS scores showed a negative pre-to-post change across both study groups. The AI Coach group experienced an average reduction of about 14 points whereas the AI Partner group showed a similar decrease which was slightly higher than 14 points (Table 2). The two groups showed comparable average changes but the AI Partner condition showed more variability which indicated that people experienced different levels of anxiety reduction.

Outcome	Condition	n	Mean Δ (SD)
FLCAS Δ	AI Coach	18	-14.22 (7.91)
FLCAS Δ	AI Partner	20	-14.05 (9.51)
IMI Δ	AI Coach	18	0.38 (0.41)
IMI Δ	AI Partner	20	0.55 (0.56)

Table 2. Pre–post change scores (Δ) for FLCAS and IMI by condition

The effect size estimates revealed that both study groups experienced significant changes which resulted in large effect sizes for both the AI Coach and AI Partner groups (Table 3). The findings demonstrate that AI-assisted conversational practice led to a substantial decrease in foreign language classroom anxiety for all participants, irrespective of their AI role.

Outcome	Condition	n	Cohen's d	Hedges' g
FLCAS Δ	AI Coach	18	-1.80	-1.71
FLCAS Δ	AI Partner	20	-1.48	-1.42
IMI Δ	AI Coach	18	0.94	0.89
IMI Δ	AI Partner	20	0.99	0.95

Table 3. Within-group effect sizes for pre–post changes in FLCAS and IMI

Intrinsic Motivation (IMI)

Both groups demonstrated similar baseline scores for intrinsic motivation which showed moderate motivation levels during the pre-test assessment (Table 4).

Timepoint	Condition	n	IMI Mean (SD)	Min–Max
Pre	AI Coach	20	4.63 (0.54)	3.87–5.54
Pre	AI Partner	20	4.38 (0.87)	2.69–5.72
Post	AI Coach	18	5.02 (0.66)	3.92–6.01
Post	AI Partner	20	4.93 (1.10)	3.15–7.00

Table 4. Descriptive statistics for intrinsic motivation (IMI) by condition and timepoint

The AI Coach group demonstrated a modest increase in IMI scores, whereas the AI Partner group showed a slightly larger mean gain (Table 2). As with FLCAS, greater variability in motivational change was observed in the AI Partner condition. The effect size estimates showed that both groups experienced moderate to large increases in intrinsic motivation which the two conditions tested failed to show any specific advantages (Table 3).

Session-Based Performance Outcomes

Accuracy Trends

Both groups achieved better session-level accuracy scores throughout the study period (Figure 1). The AI Coach condition participants achieved better accuracy progress throughout the study sessions than the AI Partner condition participants, which resulted in better accuracy performance results (Table 5).

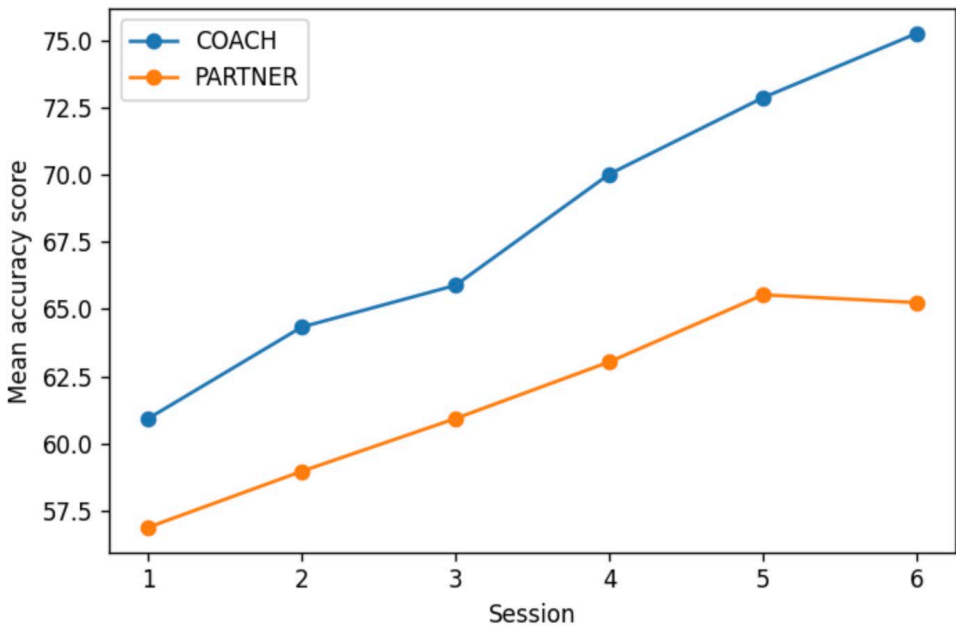


Figure 1. Accuracy trends across sessions

Metric	Condition	n	Mean slope (SD)
Accuracy slope	AI Coach	19	2.68 (1.31)
Accuracy slope	AI Partner	20	1.82 (1.18)
Fluency slope (WPM/session)	AI Coach	19	2.99 (1.83)
Fluency slope (WPM/session)	AI Partner	20	4.06 (2.25)

Table 5. Mean participant-level performance slopes across sessions by condition (accuracy and fluency)

The overall pattern showed different results for each individual study participant. The study participants exhibited two different improvement patterns, which included participants who showed fast initial progress and participants who showed slow progress throughout the study sessions.

Fluency Trends

Fluency developed throughout the three sessions of both testing conditions according to the measurement of words per minute which showed improvement across all testing periods (Figure 2). The AI Partner group showed greater improvement in average fluency progression compared to the AI Coach group (Table 5), which indicates that fluent conversational partners particularly assist with developing fluency skills.

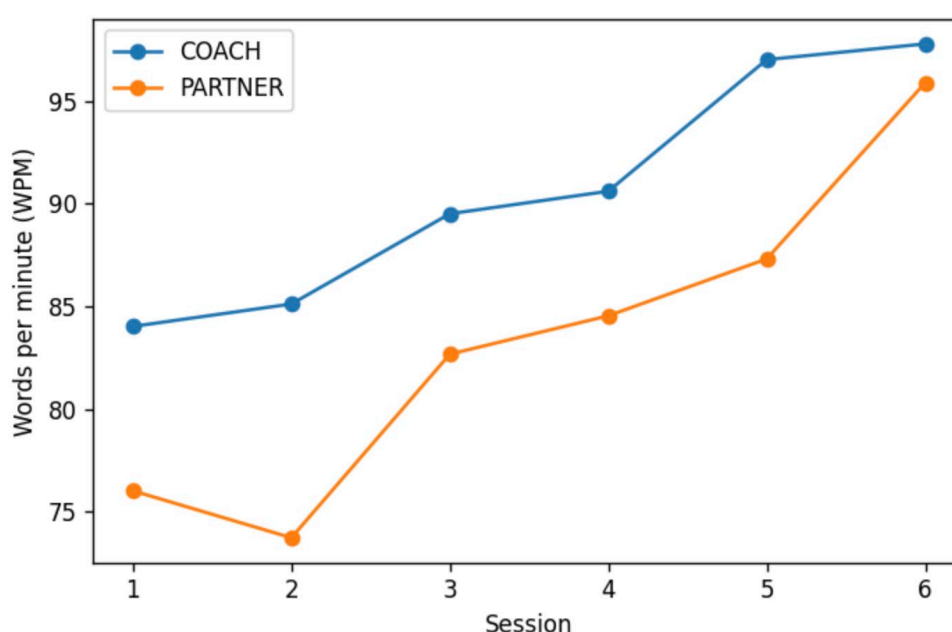


Figure 2. Fluency trends across sessions

The accuracy results showed substantial differences among the participants, yet the study found positive trends with no evidence of fluency decrease over time.

Results Summary

- The foreign language classroom anxiety levels of students showed significant improvement because both AI Coach and AI Partner conditions were implemented.
- Both groups demonstrated increased intrinsic motivation which resulted in moderate to large effect sizes.
- The session-based performance metrics showed different patterns of results with the AI Coach condition producing better accuracy gains and the AI Partner condition producing greater fluency improvements.
- The pilot study results showed high variability between individuals because of its exploratory research approach.
- The study results demonstrate that different AI conversational roles provide distinct benefits for language learning.

DISCUSSION

The results of this pilot investigation provide initial empirical support for the notion that distinct configurations of AI-assisted conversational practice in mobile language learning can differentially influence affective and performance-related outcomes. Consistent with prior research, both AI roles were associated with positive trends in learner affect and skill development, though with patterns that align with theoretical expectations regarding task orientation and interactional focus.

Researchers have demonstrated that conversational AI systems improve second language speaking abilities and decrease learner anxiety through their provision of non-threatening practice sessions which students can access anytime.¹⁴ The study by Ebadi et al. demonstrated that EFL learners who used AI-driven speaking tasks showed better speaking abilities and less anxiety compared to their traditional classroom work.¹⁵ AI chatbot studies have shown that these systems increase learner confidence and improve their willingness to communicate while they take part in interactive sessions.¹⁶ Both AI Coach and AI Partner conditions led to decreased language anxiety and increased intrinsic motivation according to the study results which confirmed earlier findings about how conversational AI usage affects emotional factors that are essential for effective language acquisition.

The other processes are very captivating, although performance was the main area related to my focus, really. The AI Coach condition demonstrated stronger gains in accuracy, whereas the AI Partner condition showed steeper improvements in fluency. This pattern supports the view that task design and feedback modality influence different facets of language development.¹⁷ Conversational agents emphasizing corrective feedback may orient learners toward form-focused processing and accuracy, while agents prioritizing naturalistic interaction may better support fluency development.¹⁸ These findings are consistent with broader second language acquisition research indicating that accuracy and fluency are semi-independent constructs sensitive to interactional framing.

People show different emotional responses which affects their capacity to do work tasks. The study found that some students showed significant progress while others maintained their same level of motivation and anxiety throughout the study. Small-scale exploratory research shows this type of variability because it results from differences in initial skills and student learning preferences and their opinions about using AI for practice.¹⁹ The development of adaptive systems which adjust their interaction methods according to student learning profiles requires educational institutions to conduct research on how previous AI exposure and learning methods affect their learning process.

The observed patterns strengthen the research results which show how emotional qualities of conversational AI systems function, especially through their capacity to provide constant non-critical dialogue which helps people practice speaking²⁰. The existing body of research shows that three specific areas, which include emotional awareness and cultural sensitivity and learner autonomy, continue to create obstacles because these elements were not completely resolved during the current pilot study.

The study produces multiple practical outcomes which result from its findings. Educators and designers can use different AI roles to create conversational practices which support particular educational goals according to the research findings.²¹ Coach-like agents which provide corrective feedback improve accuracy learning outcomes for students while Partner-like interactions which focus on conversational flow benefit students who value communicative fluency. The study shows that affective variables can change which leads researchers to support anxiety and motivation assessment together with performance assessment in their upcoming research on AI-powered language learning evaluation methods.

The pilot project has reached its endpoint, which requires researchers to recognize its existing limitations. The study results cannot be applied to broader populations because of their small sample size and brief duration of the research intervention. The study results show promising decreases in

anxiety levels together with rising motivation, but these results must await validation through future studies that will use more extensive research approaches based on authentic learner information from longitudinal research studies.²²

In summary, this pilot study demonstrates through its research results that different AI functions provide language learners with two distinct advantages. The research demonstrates that AI interaction design needs to match educational objectives while the study develops a base for future research on AI-assisted language practice through specific role-based AI functions.

LIMITATIONS

The study results face multiple limits which researchers need to address during their analysis. First, the work required testing by using a small group of people because it functioned as a pilot study. The research results should only lead to tentative conclusions because their current level of evidence establishes only limited understanding of trends and potential study results.

The brief intervention period prevents researchers from determining how learning results will persist over an extended period. The observed changes in anxiety and motivation and performance results could indicate short-term adaptation or they might show novelty effects which do not lead to long-term advancement.

The research uses self-report tools together with AI-based performance evaluation systems. FLCAS and IMI questionnaires collect critical emotional information yet self-reporting their information creates a problem because it produces personal biased results. AI-based scoring allows researchers to analyze data at large scale however the system needs validation through real human judgment comparison using outside measurement methods.

CONCLUSION

The study tested two AI-based conversational practice methods which included an AI Coach who gave correctional feedback and an AI Partner who created realistic conversational experiences to assess their impact on mobile language learning. The researchers investigated how learners experienced anxiety and motivation and language accuracy and fluency improvements between their initial assessment and their final assessment and their performance results during study sessions.

The research results demonstrate that both AI roles enable students to achieve positive results through their different support functions. Participants experienced lower levels of foreign language anxiety together with higher levels of intrinsic motivation across all study conditions. The AI Coach led to more accuracy improvements while the AI Partner resulted in bigger gains for fluency development. The results support the theoretical framework which distinguishes between two different types of second language acquisition practices: form-focused and meaning-focused practice.

The study demonstrates that researchers need to create conversational AI systems which use specific teaching objectives while showing successful implementation of a research method that connects emotional assessment with performance measurement.

ACKNOWLEDGEMENTS

The authors are grateful to the project of the Specific Research Faculty of Science UHK 2110/2025 for the financial support.

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DESIGNING FOR WELLBEING: TEACHING AI AS A MEDIUM OF CARE

Author:

MINJEE JEON

Affiliation:

MONTANA STATE UNIVERSITY, UNITED STATES

INTRODUCTION

As artificial intelligence weaves itself into the fabric of labor and self-perception, its role in design education is often flattened into a conversation about speed. In UX/UI, where design decisions are grounded in empathy and human experience, this emphasis can feel incomplete. A focus on productivity leaves little space to notice how AI meets people in the small, ordinary moments of use.

This paper begins with a set of consequential questions. What changes when undergraduate designers are asked to approach AI as a medium of care rather than a mechanism of efficiency? How does this shift change the way students think about empathy, responsibility, and ethical judgment within their design practice? These questions guided a two-project sequence in which students built AI-integrated applications to support emotional, cognitive, and physical wellbeing. Rather than positioning AI as an unseen technical layer, the course directed attention to how tone, pacing, boundaries, and restraint shape a user's experience of being addressed.

The need for such an approach is evident in existing digital environments. Research on digital health and self-tracking shows that many wellbeing and habit-tracking applications generate pressure, guilt, or ongoing self-surveillance, even when they are designed with supportive intentions.¹ When optimization becomes the dominant logic, interfaces often encourage constant monitoring or frame missed goals as failures, conditions that can erode emotional safety.² Students entering AI design spaces without ethical or affective frameworks may reproduce these patterns simply by following established norms of efficiency.

In response, the course foregrounded wellbeing as the central design problem, asking students to weigh affect, trust, cognitive load, and emotional safety alongside functionality at every stage of the design process. Approaching the work this way made care concrete. AI was no longer framed as a tool for optimization, but as something whose presence, restraint, and timing shape experience.

CONTEXTS SHAPING AI, DESIGN, AND CARE

The Logic of Optimization in Pedagogy and Practice

In most design and computing programs, AI is introduced as a tool for automation, efficiency, and rapid production. AI literacy research reflects this emphasis, often privileging functional competence over social or ethical reasoning.³ Students learn to create prompts, accelerate workflows, and generate visual output, but they receive far less guidance on how AI behaviors shape human experience. This pattern aligns with findings by Liao and colleagues in "Evaluating Moral and Social Dimensions of

AI Literacy,” which shows how many AI curricula emphasize functional competence at the expense of moral or social capacity.⁴ When technical mastery becomes the primary goal, students are not encouraged to consider how tone, boundaries, or affective cues influence the people who encounter their systems.

Researchers in human–computer interaction have noted that an optimization-first approach leaves a gap in UX/UI pedagogy, offering students few tools for thinking through the relational and ethical consequences of interaction. In *Human-Centered Artificial Intelligence*, Shneiderman foregrounds safety, agency, and emotional wellbeing as central to responsible AI design. When AI is framed chiefly around productivity, these qualities are often overlooked.⁵ In UX/UI pedagogy, where interaction shapes how people feel and respond, this absence of ethical grounding becomes difficult to ignore. Without shared ways to reason through these questions, students are left to judge AI systems primarily by output rather than by how their behavior is experienced by the people they address.

These curricular tendencies are reinforced by the interfaces students encounter in everyday digital life. Wellbeing and habit-tracking applications offer a clear example. Digital health research shows that such systems frequently structure interaction around measurement and compliance, even when framed as supportive.⁶ Scholars of self-tracking and datafication have shown how metrics-driven interfaces can intensify self-evaluation and emotional strain, particularly when users are encouraged to quantify internal states.⁷ UX research on persuasive design and dark patterns extends this critique by demonstrating how interfaces quietly pressure users toward particular actions or restrict choice.⁸ Over time, these mechanisms normalize interaction strategies driven by engagement and compliance rather than care. For students, repeated exposure to such designs can shape assumptions about what effective interaction looks like, underscoring the need for pedagogical frameworks that make the ethical and affective consequences of design decisions visible.

Care, Affect, and the Relational Nature of AI

Care ethics offers a way to think more carefully about what interaction design asks of designers, especially in situations where systems address people in moments of vulnerability. Rather than centering performance or outcomes, care ethics draws attention to how actions unfold over time and how responsibility is expressed through response. In *Moral Boundaries and Caring*, Tronto and Noddings frame care as a situated practice that depends on attentiveness to others’ needs and responsiveness to their circumstances.⁹ In UX/UI, these ethical concerns manifest through decisions about tone, friction, boundaries, visibility, and cognitive load, shaping whether interactions feel supportive, controlling, or dismissive.

Research in affective interaction and affective computing adds a complementary perspective by showing that interfaces actively shape emotional experience. Studies by McDuff, Picard, and others demonstrate how timing, language, pacing, and feedback influence attention, motivation, and perceived safety.¹⁰ These effects do not depend on overt emotional signaling; they emerge through everyday micro-interactions that users often register indirectly. When AI systems respond, ask questions, or withhold guidance, these moments are commonly interpreted as expressive acts rather than neutral outputs. Even when users understand a system as computational, its behavior is often experienced relationally, as something that addresses them rather than simply processing data.

Taken together, care ethics and affective interaction challenge the idea of AI as a neutral tool. They instead point to systems that shape experience through what they say, how they respond, and when they remain silent. For students learning UX/UI, this reframes the design task, shifting attention away from what a system can accomplish and toward how it comes across to the person encountering it. In the context of this course, these perspectives function less as abstract theories than as ways of noticing

consequence, helping students recognize how technological behavior carries ethical weight and how responsibility emerges through design decisions.

DESIGNING THE COURSE AS AN ETHICAL SYSTEM
Orienting the UX/UI Course Toward Care and Responsibility

This course introduces UX/UI as a mode of design practice concerned with interaction, sequencing, and behavior rather than visual form alone. For many graphic design students, it marks their first sustained encounter with systems whose structure shapes how users act, interpret information, and feel over time. Because UX/UI foregrounds interpretation, response, and affect, it provides a natural context for examining how design decisions carry ethical and relational consequences.

Rather than treating ethics as an external constraint or post-hoc consideration, the course integrates ethical reasoning into the design process itself. Students are asked to consider how systems behave toward users, particularly in moments involving vulnerability, attention, or self-regulation. This orientation prepares students to approach AI not as a neutral tool for efficiency, but as a participant in human experience whose presence, timing, and restraint matter.

From Groundwork to Form: Structuring Ethical Design

The course operates through a three-part project sequence: Groundwork, Framework, and Form – as outlined in Table 1. Each phase plays a distinct role in supporting ethical reasoning as a design practice, moving students from observation to synthesis to authorship.

Phase	Scope	Key Methods & Activities	Pedagogical Goal
1. Groundwork	Individual (UX Focus)	- Reverse-engineering UX design, analyzing apps - User flow & journey mapping - Empathy mapping	Recognize emotional friction & ethical blind spots. Students deconstruct existing apps to identify where "optimization" creates pressure.
2. Framework	Group & Individual (UX/UI Focus)	- Problem/Solution synthesis - Ethics Q&A & Strategy - AI Tone & Boundary definition	Synthesize shared problems & define AI mission. Moving from critique to proposal; students establish the ethical "rules" for the AI's behavior.
3. Form	Individual (UI Focus)	- Visual System & Micro-copy - Prototyping (Animation) - Final UI Design	Translate ethics into designed experience. Students use visual voice and motion to express the care-centered values defined in the Framework.

Table 1. The Pedagogical Scaffold: From Groundwork to Form

Groundwork centers on reverse engineering existing wellbeing applications to surface ethical and emotional consequences embedded in interface design. Working individually, students map

interaction flows and identify moments where interfaces introduce pressure, ambiguity, or cognitive strain. This process shifts attention away from surface aesthetics and toward the lived experience of moving through a system over time.

Framework moves the work into structured group synthesis. Drawing on Groundwork findings, students identify recurring ethical and experiential risks and articulate care-centered design aims. Through discussion and negotiation, these aims are translated into shared UX frameworks that guide subsequent design decisions.

Form returns the work to individual authorship, where students develop interface and interaction systems in direct relation to earlier ethical commitments. Visual design, micro-interactions, and AI behavior are shaped by previously defined boundaries and relational intentions, making ethical responsibility visible within everyday design choices.

CASE STUDIES IN CARE-CENTERED AI DESIGN

The following case studies examine two student projects developed within the same care-centered UX/UI sequence. *Ripple* and *Lock-In* address different domains, recovery and focus, but follow the same pedagogical structure, allowing ethical reasoning to be observed across distinct interaction contexts. Rather than presenting comprehensive project documentation, these cases highlight how students translated care-centered intentions into interaction structures and AI behavior.

***Ripple*: Designing for Recovery Without Pressure**

Ripple is a sobriety-focused application developed by a group of four students. Following Groundwork analysis of existing recovery applications, the group identified recurring interaction patterns that framed progress through discipline, surveillance, and self-control. Streak-based tracking, punitive notifications, and clinical language were found to intensify pressure during moments of vulnerability.

In response, the group reframed their design question. Rather than asking how an application might enforce sobriety, they asked what recovery could look like when dignity and emotional safety guide interaction design. This reframing shaped decisions throughout the Framework and Form phases, particularly in how AI was scoped within the system.

At the UX level, *Ripple* avoids continuous tracking and persistent reminders. Core features include a journaling space, an optional urge log, and a pattern-reflection tool that allows users to notice emotional trends without quantifying success or failure. The system does not require daily engagement and does not penalize inactivity.

AI support within *Ripple* is deliberately limited and optional. Rather than operating as a default guide, AI is available only when users choose to engage it. When activated, it offers gentle prompts or reflective questions framed in neutral, non-directive language. The group explicitly designed AI responses to avoid interpreting user data or assuming emotional intent. In moments where restraint felt more appropriate than response, the system remains silent.

Across individual executions, the group shared a guiding principle that the application should stand on its own, with AI present only to support its structure of care. As a result, *Ripple* presents AI not as a monitoring agent or corrective force, but as a restrained participant within a broader system designed to support recovery without pressure.

***Lock-In*: Designing Focus Without Coercion**

Lock-In is a focus-support application developed by another student group. Groundwork analysis revealed that many focus applications rely on rigid timers, lockout mechanisms, and punitive alerts that frame distraction as failure.

In response, the group reframed focus as a fluctuating condition rather than a resource to be enforced. The resulting design avoids mandatory sessions or performance tracking, instead offering flexible focus intervals that users can enter or exit without penalty. AI behavior mirrors this stance: the system does not monitor productivity or evaluate success. When engaged, AI offers brief check-ins or reflective prompts and remains silent when intervention would add pressure.

Together, *Ripple* and *Lock-In* demonstrate how students applied care-centered reasoning across different contexts. In both projects, ethical considerations were operationalized through restraint, optionality, and respect for user autonomy, illustrating how AI can be designed to participate in human experience without coercion or surveillance.

PEDAGOGICAL INSIGHTS FROM CARE-CENTERED DESIGN

Shifts in How Students Reasoned About AI

A consistent shift emerged across both case studies in how students contextualized AI within the UX/UI framework. Moving beyond a narrow focus on system capability or output, students began to evaluate AI through its behavioral and relational consequences. This evolution did not result from prescriptive ethical instruction, but from repeated encounters with existing systems and the need to account for their effects on users.

First, students developed a capacity to diagnose harm within everyday interaction design. During the Groundwork phase, reverse engineering revealed that features often viewed as neutral, such as streaks and rigid timers, can intensify pressure, guilt, and loss of agency. This shift resonates with critical design pedagogy, which emphasizes situated critique over abstract ethical instruction.¹¹ By tracing interaction flows and identifying points of emotional strain, students came to see harm not as an unintended side effect, but as something produced through ordinary, deliberate design choices.

Second, students transitioned from a logic of enforcement to a logic of care. In both *Ripple* and *Lock-In*, this marked a departure from industry norms that typically treat recovery and focus as matters of discipline. Rather than seeking to correct user behavior, students began to prioritize the conditions necessary for user dignity, autonomy, and emotional safety. This reframing aligns with core principles of care ethics, which emphasize attentiveness and responsiveness to vulnerability as the basis for ethical action.¹² Crucially, this shift occurred at the conceptual stage, shaping the project's direction before interface details or AI logic were finalized.

Third, students demonstrated the ability to operationalize ethical intent through tangible design decisions. Ethical reasoning moved beyond abstraction and manifested in concrete decisions regarding pacing, boundaries, and restraint. In practice, this meant designing systems that functioned without constant monitoring, allowed for disengagement without penalty, and respected silence as a valid interaction. AI was scoped with precision, appearing only when invited and withdrawing before becoming intrusive. These choices reflect a growing realization that responsibility in AI design resides not only in what a system can do, but in the designer's discipline to withhold intervention where it might be intrusive.¹³

Across these projects, this progression suggests an expansion of the students' ethical imagination. Rather than treating ethics as an external constraint or a final checklist, students came to see it as inseparable from the architecture of interaction. Care was no longer an added value, but a quality emerging from structure, timing, and relational stance. This evolution supports the argument that ethical capacity is best cultivated through practice, particularly when designers are compelled to confront the lived, emotional consequences of their technical decisions.

Learning to Design AI as a Relational Medium

Across projects, students consistently emphasized autonomy, restraint, and transparency as ethical priorities, framing AI as something that should assist without directing user behavior. Rather than evaluating AI primarily in terms of capability or efficiency, students began to ask how a system’s presence, timing, and restraint might be experienced by a person over time. This shift reframed AI from a tool that produces outputs to a participant in interaction, whose actions, silences, and limits shape how users feel addressed. This emphasis was echoed in students’ ethical rationale statements, as summarized in Table 2, where autonomy, restraint, tone, and transparency consistently surfaced as markers of care rather than control.

Ethical Theme	Frequency	Student Definition of Care (Qualitative Coding)
Autonomy / User Control	88%(14/16)	AI helps, not tells. Students emphasized that AI should assist but never direct, ensuring users maintain agency (e.g., "AI assists but never directs").
Empathy / Tone Design	81%(13/16)	Warm but not intimate. Designing a voice that is supportive yet professional, avoiding false friendship (e.g., "Friendly but not a friend").
Boundary / Restraint	75%(12/16)	No emotional mimicry. Deliberate decisions to limit AI monitoring or pushiness to preserve emotional safety (e.g., "No over-monitoring").
Inclusivity / Fairness	69%(11/16)	Personalization without stereotype. Adapting to user needs (like irregular cycles) without making generalized assumptions.
Transparency	63%(10/16)	Clarity without overload. Ensuring the user can see what the AI sees and understands how data is used.
Reflection / Revision	56%(9/16)	Ethics refined through critique. Evidence of students simplifying or revising tone based on feedback regarding safety or clarity.

Table 2. Thematic Coding of Student Rationales

This understanding emerged through encounter rather than instruction. Students did not begin by designing AI features, instead, they began by critically examining existing systems and tracing how interaction patterns unfold across moments of use. Reverse engineering wellbeing and productivity applications exposed how seemingly minor design decisions, such as automated nudges, persistent reminders, or performance indicators, can accumulate into experiences of pressure or surveillance. This process aligns with research in reflective and critical design pedagogy, which argues that ethical judgment is most effectively developed through situated critique of real systems rather than through abstract principles alone.¹⁴ By confronting the lived consequences of existing interfaces, students learned to recognize ethical stakes embedded in ordinary interaction choices.

As projects progressed, students increasingly treated restraint as a deliberate design action rather than an absence of functionality. Decisions to limit AI intervention, allow disengagement, or withhold feedback were framed not as missed opportunities, but as ways of preserving user autonomy and

emotional safety. This orientation echoes long-standing arguments in human–computer interaction that non-intervention, calmness, and background presence can be as consequential as overt system behavior.¹⁵ In both *Ripple* and *Lock-In*, students learned that choosing when not to respond is itself a form of responsibility, particularly in contexts involving vulnerability, fatigue, or cognitive strain. Importantly, this relational framing of AI proved transferable across domains. Although recovery and focus present different experiential demands, students applied similar ethical reasoning in both contexts, suggesting that care is not domain-specific but structurally enacted. By learning to shape interaction through pacing, boundaries, and optionality, students demonstrated that care-centered AI design is not opposed to functionality, but oriented toward how functionality is encountered. This supports broader arguments in human-centered AI research that responsibility in AI systems emerges not only from what systems can do, but from how designers delimit their role within human experience.¹⁶

CONCLUSION

This paper has argued for a reframing of AI within UX/UI education, not as a mechanism of efficiency, but as a relational system whose behaviors shape emotional, cognitive, and ethical experience. Through a care-centered pedagogical framework and two student case studies, it has shown how undergraduate designers can develop ethical capacity by attending to how AI systems speak, respond, withdraw, and set boundaries.

The student projects examined here demonstrate that when care is treated as a design constraint rather than an abstract value, it produces tangible shifts in reasoning and practice. Students moved from enforcing behavior to supporting conditions, from optimizing outcomes to safeguarding dignity, and from maximizing system presence to practicing restraint. These shifts did not arise from prescriptive ethical instruction, but from sustained engagement with the consequences of interaction design.

As AI continues to be integrated into everyday digital systems, the responsibility placed on designers will only grow. UX/UI education therefore plays a critical role in shaping how future designers understand that responsibility. Teaching students to design AI as care offers one pathway for cultivating designers who are not only technically capable, but ethically attentive to the lived experiences their systems produce.

While this study is limited to a single course context, its findings suggest that ethical reasoning in AI design is most effectively developed through situated practice. When students are asked to confront the emotional realities of interaction and to account for them through design, ethics becomes inseparable from craft. In this sense, care is not an add-on to AI design education, but a foundational lens through which responsible systems can be imagined and built.

NOTES

- ¹ Deborah Lupton, *The Quantified Self* (Cambridge: Polity Press, 2016).
- ² Deborah Lupton, "Health Promotion in the Digital Era: A Critical Commentary," *Health Promotion International* 30, no. 1 (2015): 174–183.
- ³ Q. Vera Liao, Daniel Gruen, and Sarah Miller, "Evaluating Moral and Social Dimensions of AI Literacy," *ACM Transactions on Computer-Human Interaction* 27, no. 4 (2020): Article 27, <https://doi.org/10.1145/3375627>.
- ⁴ Liao, Gruen, and Miller, "Evaluating Moral and Social Dimensions of AI Literacy."
- ⁵ Ben Shneiderman, *Human-Centered Artificial Intelligence: Reliable, Safe, and Trustworthy* (New York: Oxford University Press, 2022).
- ⁶ Deborah Lupton, *The Quantified Self* (Cambridge: Polity Press, 2016).
- ⁷ Minna Ruckenstein and Natasha Dow Schüll, "The Datafication of Self," *Annual Review of Anthropology* 46 (2017): 261–278.
- ⁸ Colin M. Gray, Yubo Kou, Bryan Battles, Joseph Hoggatt, and Austin Toombs, "The Dark (Patterns) Side of UX Design," in *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (New York: ACM, 2018), 1–14.
- ⁹ Joan C. Tronto, *Moral Boundaries: A Political Argument for an Ethic of Care* (New York: Routledge, 1993); Nel Noddings, *Caring: A Relational Approach to Ethics and Moral Education*, 2nd ed. (Berkeley: University of California Press, 2003).
- ¹⁰ Rosalind W. Picard, *Affective Computing* (Cambridge, MA: MIT Press, 1997); Daniel McDuff, "Affect-Aware Interactive Systems: Strengths, Limitations, and Opportunities," *Journal of Human-Computer Interaction* 35, no. 4–5 (2019): 295–308.
- ¹¹ Anthony Dunne and Fiona Raby, *Speculative Everything: Design, Fiction, and Social Dreaming* (Cambridge, MA: MIT Press, 2013).
- ¹² Joan C. Tronto, "An Ethic of Care," *Generations* 22, no. 3 (1998): 15–20.
- ¹³ Donald A. Schön, *The Reflective Practitioner: How Professionals Think in Action* (New York: Basic Books, 1983).
- ¹⁴ Paul Dourish, *Where the Action Is: The Foundations of Embodied Interaction* (Cambridge, MA: MIT Press, 2001).
- ¹⁵ Mark Weiser and John Seely Brown, "Designing Calm Technology," *PowerGrid Journal* 1, no. 1 (1996).
- ¹⁶ Virginia Dignum, *Responsible Artificial Intelligence: How to Develop and Use AI in a Responsible Way* (Cham, Switzerland: Springer, 2019).

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VOICING: A STORYTELLING APPROACH TO TEACHING AND LEARNING

Author:

ELISABETH BIRK, UDO BIRK AND HANNE BIRK

Affiliation:

L-UNIVERSITÀ TA' MALTA (UM), MALTA. UNIVERSITY OF APPLIED SCIENCES OF THE GRISONS, SWITZERLAND. UNIVERSITY OF ST. GALLEN, SWITZERLAND

INTRODUCTION

Finding one's own voice, reflecting, being open to listen and embracing diversity is more vital than ever in the age of genAI – these competencies are essential for human encounters and the construction of communities of responsible global citizens. In consequence, this contribution tries to find answers to the following core question: How can the reconceptualization of teaching and learning as dynamic, co-creative narrative processes contribute to the students finding their own voices, i.e. to the unfolding of specific competencies, such as AI Literacy, and Future Skills (Ehlers)¹ which also assure lifelong learning. As the students of today already are the agents in charge of our shared future, the research focus requires a methodological approach based on Scholarship of Teaching and Learning (SoTL) frameworks which rely on systematic, evidence-based, qualitative inquiries into learning processes, correlates the perspectives of teachers and learners and reflects on given (curricular) frameworks.

In order to establish a theoretical foundation, the first step of the contribution involves mapping these innovative transformations by reimagining teaching and learning designs (including e.g. learning objectives, methods and assessment) fundamentally through the lens of narratological concepts (such as narration/focalization or telling/showing).² What does it mean to act as a storyteller in class? What happens when you turn into a listener to stories co-created with/by your students? Are all narrators reliable, and in which genres do we find ourselves proficient—utopian or dystopian? Foci include the relevance of diverse, multiperspective storytelling in hybrid learning settings addressing phenomena such as post-pandemic student absences and the necessity for supporting the students' voicing (instead of silencing). Secondly, by combining evidence-based examples from three universities – encompassing both the humanities and natural sciences – the scalability of this approach, the transfer potentials going beyond the actual contexts will become clearer. It will be demonstrated that storytelling is intrinsically transdisciplinary, correlates with a broad range of competence models, and is – due to its flexibility and potential correlations with gamified teaching designs – not only very apt to be broadly disseminated but can easily act as a driving force in curricular innovations.

Reconceptualizing Teaching and Learning from a Narratological Perspective

In the following, teaching and learning designs are fundamentally reimagined through the lens of narratological concepts. This means a) to map interfaces between the didactic hexagon, devised by Meyer,³ and narratological approaches, and b) to focus on the concept of constructive alignment⁴ in

order to identify more clearly the competency bundles we are addressing by introducing storytelling practices in teaching and learning with and without generative AI.

Transfer of the Didactic Hexagon (Meyer) into a Narratological Context

In his hexagon Meyer discusses the six steps (1-6) that are useful to reflect on in the process of preparing for a course and how they are correlated with teaching quality criteria. If a teaching sequence is cast as a, maybe even collaborative, storytelling event, the following shifting process or transfer, is initiated:

The transparency of learning objectives (1) lecturers try to achieve in their course designs is correlated with the specific functional potentials of storytelling, that is for example the creation of alternative worlds⁵, “mak[ing] the unimaginable imaginable”.⁶ In consequence, thoughts on content structure and clarity (2) address now specifically narrative selection, sequencing and emplotment. The time structure (3) of the course may be correlated with all of the temporal narratological strategies (such as order, duration, frequency...) Thoughts on methodological plurality and design (4) refer to how storytelling is employed in class, is it done collaboratively or is generative AI used and which genres are introduced? Or are specific means such as unreliable narration⁷ employed in order to show the students how powerful e.g. fake news can be? Furthermore, the social dimensions (5) of a course or the learning atmosphere are certainly associated with authorship, with the questions of who works together in the making of the story. Moreover, this dimension is specifically about voice,⁸ about whose narrative voices surface, who can be heard, and about the question whether there are any strategies of silencing in class that we have to undermine. And finally there is the spatial structure or setting (6), which again can be understood rather literally as establishing the narrative environment but may also refer to questions, such as: How can we establish a safe space, in which students speak out, in which storytelling can help the students to find their own voice, to experience cultural diversity within their own group.

Narrativizing the Constructive Alignment

The theoretical sketch presented so far needs to be complemented by drawing on Bigg's and Tang's concept of Constructive Alignment and transferring it into a storytelling environment. This transfer entails the following core questions.

With a focus on learning objectives, the main question is: What happens if the learning objectives are mapped on storytelling processes? Firstly, especially cognitive and affective learning objectives will tend to correlate to competencies that manifest themselves in communicative performances that can easily be designed as storytelling. Referring to Bloom's taxonomy differentiation⁹ in various cognitive domain levels, including 'remembering', 'understanding', 'applying', 'analysing', 'evaluating' and 'creating', it can be stated that all these domains seem to be downright predestined to be stimulated by narrative practice.

Secondly, narration provides media-specific process characteristics (such as focalization for example) that provide ideal vantage points for acquiring higher level learning objectives such as 'critical thinking' or 'being able to change perspectives'.

In respect to teaching methods or learning activities, it needs to be stated that storytelling is an extremely multifaceted and versatile teaching method that can easily be combined with exercises that boost AI Literacy. For example, co-creative storytelling can either affirm collaborative competencies in the process of working with other humans (lecturers or students) or AI Literacy in case of narrative prompting exercises. A further specific area of its application has surfaced in post-Covid educational contexts that face sometimes the phenomenon of student absences. Combining flipped classroom set-ups with narrative practice allows for lecturers to cast themselves truly as storytellers, who can focus

on their own specific professional experiences, on phenomena no shared slide deck can substitute. And this in turn tends to draw students back into classrooms. This method of experiential storytelling on-campus can of course be carried out in combination with guest speakers and student interview formats and has proven to be very promising.¹⁰

Finally in reference to the alignment with modes of assessment it can be stated that due to the fact that narratives are specifically apt to be included in peer-review processes or portfolio exams, storytelling may function as boosters of curricular transformation towards more flexible and diverse study regulations.

Storytelling Approaches to Teaching and Learning: Three Use Cases

In the following section, three evidence-based good-practice examples provide an international and transdisciplinary storytelling approach to teaching and learning by linking insights from the area of Higher Educations Studies (University of St. Gallen, Switzerland) with experiences in the realm of MedTech curriculum design (University of Applied Sciences of the Grisons, Switzerland) and an innovative teaching format rooted at the interfaces of linguistics, cultural studies, and German as a foreign language at the University of Malta.

Teaching Alliance Exchange (TAE): A Narratological Format for Teaching Visits

The first use case focuses on a narrativized template for the observation of teaching processes at the University of St. Gallen; it grows out of a teaching consultant's experiences. Part of the job are 'teaching visits' in order to provide observation data, that can then be used in discussions with the lecturers to advance teaching innovation. As the templates for teaching visits that had been researched did not seem to fit the purpose adequately, an innovative, narratological approach was devised, which is the 'Teaching Alliance Exchange (TAE) template'. It represents a fundamental revision of the concept of peer observation/teaching supervision, as it is based on conceptualizing a teaching sequence as a storytelling event or more precisely on the transfer of narratological categories into university teaching observation parameters.

Main aims of the approach have been, firstly to be transparent in the communication with the lecturers, i.e. to be able to give them a more precise overview of what the teaching consultant team is looking out for when visiting their class. Secondly it is intended to establish a kind of teaching alliance, to clarify that the teaching consultants are there for them, to work with them towards teaching innovation, that the team is not personifying judging observers thus unwillingly contributing to unmooring experiences with teaching visits.

One main effect, that could be noticed using TAE so far has been that the narratological categories have provided the consultants with the chance to observe in much more detail. In other words, going through the narratological toolkit helps the consultants to see more and understand the phenomena noticed better. For example, by using the differentiation between narration and focalization, it cannot only be determined whose voices we hear and discuss, describing teaching interaction or student participation, it can also be explored whether there are dominant perspectives or whether maybe other perspectives have even been marginalized.

Another example includes temporal aspects, not only teaching speed can be focused on but much more detail can surface and debriefings can address achronological sequences, pauses, summaries and the orchestration of temporal teaching strategies. In sum, it can be stated that the increase in precision has had an extremely positive impact, it affirmed mutual trust in the discussions with the lecturers due to a higher degree of transparency and the lecturers have provided so far very positive feedback telling us that the TAE represents a productive means towards teaching innovation.

But another outcome has been even more promising: several lecturers reported that they enjoyed the fact that talking about their teaching in the terms of a storytelling event, cast them implicitly in the role of a narrator or even an author. Seeing their teaching as a narrative artefact meant that they felt not only more in control, being able to change the ‘story’, but furthermore they could reflect on their role from a distance, they could think about themselves as a ‘lecturer persona’ without a potential loss of authenticity. And naturally the construction of a ‘persona’ can be worked on or revised – which in turn means an increase in professional teaching agency.

Storytelling as a Design Principle in Medical Engineering Education

The second use case explores the functional potentials of narration as an innovative format in Medical Engineering Education at the University of Applied Sciences of the Grisons. Storytelling has proven a useful tool for both practical teaching and curriculum development in engineering. In a classroom setting, the contrast between developing a blackboard chart and using a pre-structured PowerPoint presentation reflects two narrative modalities: Blackboard charts enable an emergent narrative that can adapt to the interaction with students and make conceptual development visible. PowerPoint, by contrast, tends to represent a purposeful narrative structure, where the problem, its development, and the resolution can be presented multimodally.¹¹ In both situations, keeping a consistent point of view¹² helps the audience to follow the story without losing track, while changing perspectives can contribute to the students realizing multifaceted complexities, literally seeing them visualized.

In curriculum design, narrative approaches facilitate especially coordination processes with partners within and outside the university. Co-constructed ‘student journey’ narratives function as boundary objects,¹³ enabling teams consisting of staff from engineering, medicine, and ethics to co-construct students’ perspectives, identify competencies, understand course prerequisites and sequencing, and anticipate gaps. Due to transdisciplinary communication and understanding being strengthened, such narratives also help to constitute communal identities within the study program.¹⁴

Furthermore, the task of engaging stakeholders, in particular industry partners, has also been supported by storytelling. Shared future-oriented narratives help to develop active industry collaboration by highlighting mutual benefits and align expectations: For instance, joint lab teaching arrangements simultaneously advance student competencies and provide companies with design insights. Evidence-based success stories¹⁵ strengthen these partnerships even more, thereby further promoting the study program.

In sum, these examples show especially the potentials of visualized narratives and future-oriented narratives in curriculum design, they highlight not only that narrative involvement may support changes in perspective but also that stories may advance understanding in heterogeneous teams, thus contributing to shared visions and the construction of communal identities.

Narrative Games in a Linguistics Class

The third good practice example illustrates the multifaceted competencies which can be empowered by introducing a narrative game in a linguistics class. Roleplaying games (RPGs), such as, e.g., Dungeons and Dragons, are narrative games with game mechanics that often use elements from board games or card games. Invented in the 1970s, RPGs have since developed to include multiple different genres and themes. And today they are increasingly being used for didactic purposes.

The game Dialect (developed by the studio Thorny Games) lets players take on the roles of a group of isolated people (e.g. settlers stranded on Mars in a SF setting). Players then make decisions about their environment and use prompts from the game to invent words that could be meaningfully used in this environment. The game always concludes with a change in the characters’ situation, that ends their

isolation and forces them to abandon their newly created language. Dialect is “a game about language and how it dies”, as the subtitle of the rulebook states.¹⁶

Dialect was used in a linguistics class (on BA level) in a module dedicated to the endangerment and loss of languages. The game was adapted (and abridged) to fit a two hour slot and safety mechanisms were introduced that allowed players to opt out should the experience become too intense.

The game allowed students to experience some of the joy of linguistic creation and the loss of language in a safe, fictional environment. The principal learning objective was to make students aware of the value communities place on their languages and of the circumstances potentially involved in language change and language loss. These objectives were certainly achieved – e.g., students enthusiastically took pictures of their linguistic creations and were reluctant to let go of them. The game achieved this precisely by inviting students to take on the perspective of speakers affected by a partial loss of a language. So in sum, it can be stated, the narrative game invited the students to change perspectives and thus not only to understand but also to emotionally experience the main learning objectives.

On the Functional Potentials of Storytelling in Teaching and Learning: Future Skills and AI Literacy

A range of competency bundles directly correlated with storytelling have repeatedly been emerging so far, implicitly in the theoretical foundation as well as explicitly in the use cases. These include certainly narrative collaboration competences:¹⁷ Naturally communication and presentation skills¹⁸ are trained in the narrative process as well as digital competencies¹⁹ or, e.g., prompting when lecturers/students work with generative AI. But, either way, in order to work on the creation of stories together a specifically high degree of teamwork is required which entails not only the application of problem-solving skills.

Furthermore, and on a more general level, the application of sensemaking abilities²⁰ is required: When participants try to work on narrative emplotment, they have to make decisions which have consequences on the set-up of their fictional universe, consequences the impact of which they will realize themselves pretty quickly in shared feedback loops.

In addition, the creation of a story and the reading of it draws the authors and readers (or players) into their created story-world, they begin to see the world from other perspectives, they necessarily realize in turn that their construction of the world, the way they see things is not the only option. Thus, storytelling invites changing perspectives by shifting narrative focalizations, it allows the students and lecturers to experience plurality and cultural diversity.²¹ This results not only in affirming openness, it can also require a high degree of ambiguity tolerance,²² to be able to endure the fact that things are not clear-cut, not either-or but everything in-between. Necessarily this results in the participants’ reflecting on their own ways of perception and on their own cognitive frames, they are drawn into self-reflexion processes which include critical thinking, when they try to position themselves.²³

Moreover, when a story is created, creative imagination is used in an innovative process, to construct something new,²⁴ but precisely this authorship implies a tremendous responsibility, the narrated world created underlies ownership and governance, it is the result of the authors’ decisions, their selections, their emplotment, it is human agency that called it into this world.²⁵ And whether the participants work together with friends or generativeAI, there will be narrative voices surfacing and it is precisely this voicing of, e.g., students that will be met by other students’ listening and resonance, by responses to the narrative perspectives they have been invited to share. In other words, storytelling in class is a transformative means of communicative exchange posing emotional as well as reflexive challenges as students can explore ever new contexts together, thus narrative production can contribute to students

acquiring Learning Literacy:²⁶ Storytelling in class may empower lifelong learning as well as the construction of heterogeneous communal identities.

This discussion and the references to Ehler's concept of Future Skills on the one hand and the UNESCO AI competency framework for students as well as the UNESCO policy framework for the use of generative AI in education and research on the other hand, illustrate that the potential effects of a storytelling approach in teaching and learning correlate with a really broad range of future-oriented competencies. Finding one's own voice together with others, reflecting, being open to listen and embracing diversity are all competencies that, given the fact that genAI is ever-present, are certainly now more vital than ever, as these competencies are essential for respectful and mindful human encounters and the construction of communities of responsible global citizens.

NOTES

¹ Ulf-Daniel Ehlers, *Future Skills: Lernen der Zukunft - Hochschule der Zukunft* (Wiesbaden: Springer VS, 2020), <https://doi.org/10.1007/978-3-658-29297-3>.

² For representations of narratological core concepts, see for example: Mieke Bal, *Narratology: Introduction to the Theory of Narrative* (Toronto and Buffalo: University of Toronto Press, 1985); Walter Grünzweig and Andreas Solbach, eds., *Grenzüberschreitungen: Narratologie im Kontext / Transcending Boundaries: Narratology in Context* (Tübingen: Narr, 1999); Manfred Jahn, "Frames, Preferences, and the Reading of Third-Person Narratives: Towards a Cognitive Narratology," *Poetics Today* 18, no. 4 (1997): 441-68; James Phelan and Peter J. Rabinowitz, eds., *A Companion to Narrative Theory* (London: Blackwell, 2005).

³ Hilbert Meyer, *Leitfaden Unterrichtsvorbereitung* (Berlin: Cornelsen, 2007), 177-82.

⁴ John Biggs and Catherine Tang, *Teaching for Quality Learning at University: What the Student Does* (Maidenhead: Open University Press, 2011) and Johannes Wildt and Beatrix Wildt, "Lernprozessorientiertes Prüfen im 'Constructive Alignment,'" in *Neues Handbuch Hochschullehre*, Teil H: *Prüfungen und Leistungskontrollen. Weiterentwicklung des Prüfungssystems in der Konsequenz des Bologna-Prozesses*, ed. Bernd Berendt et al. (Berlin: Raabe, 2011), 1-46.

⁵ Hanne Birk, *AlterNative Memories: Kulturspezifische Inszenierungen von Erinnerung in zeitgenössischen Romanen indigener Autor/inn/en Australiens, Kanadas und Aotearoas/Neuseelands* (Trier: WVT, 2008).

⁶ Marco S. Maffei, "Storytelling," *powernavi ecosystems of trust*, accessed January 29, 2026, Storytelling.

⁷ Ansgar Nünning, "'But Why Will You Say That I Am Mad?' On the Theory, History, and Signals of Unreliable Narration in British Fiction," *Arbeiten aus Anglistik und Amerikanistik* 22, no. 1 (1997): 83-106.

⁸ Susan Sniader Lanser, *Fictions of Authority: Women Writers and Narrative Voice* (Ithaca: Cornell University Press, 1992).

⁹ Benjamin S. Bloom, Max D. Engelhart, Edward J. Furst, Walker H. Hill, and David R. Krathwohl, eds., *Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I: Cognitive Domain* (New York: David McKay Company, 1956).

¹⁰ Hanne Birk and Sebastian Meisel, "TEST: Blended Narratives – Ein Lehransatz für die digitale Zukunft," *Hochschulforum Digitalisierung*, November 22, 2024, accessed January 28, 2026, TEST : Blended Narratives – Ein Lehransatz für die digitale Zukunft - Hochschulforum Digitalisierung.

¹¹ Gunther R. Kress, *Multimodality: A Social Semiotic Approach to Contemporary Communication* (London: Routledge, 2010).

¹² Burkhard Niederhoff, "Perspective – Point of View," in *The Living Handbook of Narratology*, ed. Peter Hühn et al. (Hamburg: Hamburg University), accessed January 28, 2026, Perspective - Point of View - the living handbook of narratology

¹³ Susan Leigh Star and James R. Griesemer, "Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39," *Social Studies of Science* 19, no. 3 (1989): 387-420.

¹⁴ Anna Sfard and Anna Prusak, "Telling Identities: In Search of an Analytic Tool for Investigating Learning as a Culturally Shaped Activity," *Educational Researcher* 34, no. 4 (2005): 14-22.

¹⁵ Maxine Alterio and Janice McDrury, *Learning Through Storytelling in Higher Education: Using Reflection and Experience to Improve Learning* (London: Routledge, 2003).

¹⁶ Thorny Games, "Dialect: A Game About Language and How It Dies," *Thorny Games*, accessed January 29, 2026, Dialect: A Game About Language and How it Dies – Thorny Games

¹⁷ If you are interested in collaboratively designing your own story for free (no strings attached), getting it published online and taking part in the ensuing discussions and research with a focus on the transformative potential of narratives, please feel welcome to visit the following website: <https://powernavi.ch/storytelling/>, accessed January 29, 2026

¹⁸ This corresponds directly to the "Cooperation Competence" and "Communication Competence" described in Ulf-Daniel Ehlers, "Future Skills as New Currency for the World of Tomorrow," in *Handbook of Open, Distance and Digital Education*, ed. Olaf Zawacki-Richter and Insung Jung (Singapore: Springer, 2023), 1119.

¹⁹ Cf. "Digital Literacy" in Ehlers, 1119.

²⁰ Cf. "Sensemaking" in Ehlers, 1119.

²¹ Cf. Fengchun Miao and Wayne Holmes, *Guidance for Generative AI in Education and Research* (Paris: UNESCO, 2023), 24, 26.

²² Cf. "Ambiguity Competence" in Ehlers, "Future Skills as New Currency", 1119.

²³ Cf. "Reflective Competence" in Ehlers, 1119.

²⁴ Cf. "Innovation Competence" in Ehlers, 1119.

²⁵ In the context of narrative collaborations with genAI please see the references to "Human agency", "Human accountability" and "Embodied ethics" in Fengchun Miao, Kelly Shiohira, and Natalie Lao, *AI Competency Framework for Students* (Paris: UNESCO Publishing, 2024), 19. Cf. "Ethical Competence" in Ehlers, 1119.

²⁶ Cf. "Learning Literacy" in Ehlers, 1119.

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A PEER FEEDBACK TOOL AND LEARNING ANALYTICS CASE STUDY FOR EQUITABLE GROUP ASSESSMENT

Author:

RABEYA KHATOON, KARINE YUSUFF

Affiliation:

UNIVERSITY OF BRISTOL, UNITED KINGDOM

INTRODUCTION

Peer review has long been recognized as a valuable educational practice that actively involves learners in the assessment process. Traditional instructor-led approaches often position students as passive recipients of feedback, whereas peer review encourages learners to critically engage with their peers' work, fostering higher-order cognitive skills such as analysis, evaluation, and reflection.¹ Peer assessment not only enhances students' understanding of disciplinary standards but also supports the development of evaluative judgement - the ability to make informed judgements about the quality of work, both one's own and that of others.

Despite these pedagogical benefits, implementing peer review effectively presents challenges, including staff workload, inconsistent feedback quality, and issues with student motivation.² Digital tools that scaffold peer review activities increasingly play a crucial role in addressing these problems. By structuring peer-to-peer interactions, standardizing processes, and providing clear rubrics, these tools reduce administrative burdens while maintaining pedagogical value.

Several studies have demonstrated how learning technologies and analytics can support teamwork evaluation and peer engagement. Fidalgo-Blanco et al.³ designed a learning tool that generated analytics of teamwork engagement based on student-to-student interactions in dedicated message boards. Their empirical implementation incorporated these analytics into individual teamwork grades and distinguished between active participants (message authors) and passive participants (viewers). Similarly, Hernández-García et al.⁴ used learning management system log data to evaluate teamwork and highlighted the importance of tracking participation to ensure a fair distribution of tasks among team members.

One such tool, FeedbackFruits, is an educational technology platform that supports active learning through structured peer review, interactive student-to-student feedback, collaborative assignments, and integrated assessment workflows. It is designed to integrate seamlessly with common Learning Management Systems (LMS) such as Canvas, Blackboard, and Moodle, enabling instructors to embed activities directly within course modules.⁵ This learning technology effectively masks its complex analytical systems and has been shown to be user-friendly from both staff and student perspectives⁶ (e.g., Campbell et al.). The peer review and group member evaluation tools within FeedbackFruits allow instructors to set clear rubrics and criteria, automate the distribution of submissions and reviews, support multiple formats (documents, presentations, multimedia), offer anonymity options, and facilitate self-assessment and reflection phases.

Several real-world case studies further demonstrate the impact of FeedbackFruits on student engagement and learning. The Paul Merage School of Business at UC Irvine reported that integrating the Peer Review tool resulted in high participation rates and richer peer interactions, with educators noting that thoughtful assignment design supported diverse perspectives and improved engagement with course content.⁷ A use case from Imperial College London highlighted the flexibility and ease of activity design within FeedbackFruits, as well as its ability to provide a safe space for students to voice opinions.⁸ In contrast, a Monash University case study emphasized the need for continuous reminders to encourage student participation and ensure that the pedagogical benefits of the tool are fully realized.⁹

In this paper, we present a case study demonstrating how formative, anonymised peer ratings within FeedbackFruits can enhance fairness in teamwork in a diverse MSc cohort. Our design aligns with Francis et al.'s¹⁰ all four key elements to support effective teamwork activities where we focus on the usefulness of ongoing monitoring and support in this paper. We investigate whether receiving higher peer ratings helps build student confidence over time and facilitates agreement on equity-based work-share. To our knowledge, this is the first study examining how FeedbackFruits contributes to confidence building and negotiation skills in group dissertation settings.

Our analysis also situates this work within the broader literature on learning analytics and formative assessment, highlighting the role of peer-generated data in shaping trust, self-perception, and group dynamics (see e.g., Banihashem et al.,¹¹ Darvishi et al.,¹² Lu and Hoek¹³). We contribute new insights into how light-touch, ongoing evaluations can support equitable teamwork and relational contract formation across diverse student groups.

CASE STUDY DESIGN AND DATA

We examine teamwork dynamics in an MSc programme at a Russell Group university using weekly group member evaluation data. The cohort consists of 14 teams, each comprising three to five students, working on a group dissertation that accounts for 60 credits, or one-third of the MSc degree. The dissertation is organised into three phases running from January to August. In total, students submit self- and peer-evaluations 14 times: weekly for seven weeks between January and March (Phase 1), weekly for three weeks between June and July (Phase 2), and fortnightly for three additional rounds between July and August (Phase 3).

In Phase 1, students work in teams to collect and process data and prepare a lab report. This component is assessed on a pass/fail basis and does not contribute marks toward the final dissertation grade. During this phase, students complete weekly self- and peer-evaluations using the group member evaluation function in FeedbackFruits, with both ratings and written comments remaining anonymous.

In Phase 2, students prepare for an individual presentation that contributes 20% to their final grade. Although the assessment is individual, students continue to work in groups and submit weekly self- and peer-evaluations.

In the final phase, students produce a group report. Teamwork evaluations during this phase are collected fortnightly and remain formative until students submit a final, agreed summative teamwork share. This agreed share is then used to weight the group mark to derive individual marks. Further details of the study design are provided in Khatoun.¹⁴ It is important to note that the total contribution must sum to one, with an equal division representing a fair equity share. Students receiving less than their fair share obtain a lower individual mark than the group mark, while those receiving more obtain a higher individual mark.

		Self-Evaluation		Average Peer Evaluation	
		Frequency	Percent	Frequency	Percent
No contribution (0)	Below the fair share	12	2.35	24	3.39
Much less than average contribution (1)					
Little less than average contribution (2)					
Average contribution (3)	Fair share	252	49.41	298	42.09
Little more than average contribution (4)	Above the fair share	246	48.24	386	54.52
Much more than average contribution (5)					
Total (68 students x 14 periods)		510	100	708	100

Table 1. Rubric of weekly group member evaluation, equity share mapping, and summary data

Table 1 summarizes how weekly contribution ratings map onto equity-share categories. Not all 68 students participated every week, resulting in 510 self-evaluations and 708 peer evaluations. The higher number of peer evaluations reflects that a student may receive a rating as long as one teammate submits feedback that week.¹⁵

Across those who participated, nearly half rated themselves and their peers above the fair share; only 2 to 3% rated below. Engagement peaked in Week 1 and Week 10 (coinciding with the summative presentation). Only two students participated every week, and one student never engaged at all (Figure 1).

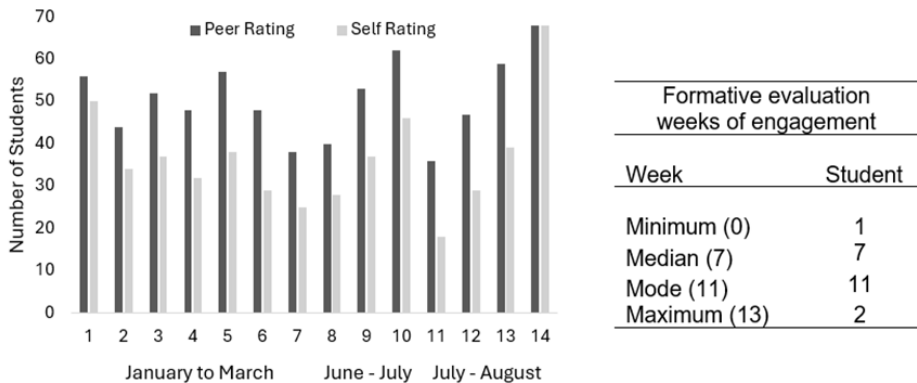


Figure 1. Student engagement with Group Member Evaluation. Week 14 is the final agreed summative evaluation with a 100% engagement.

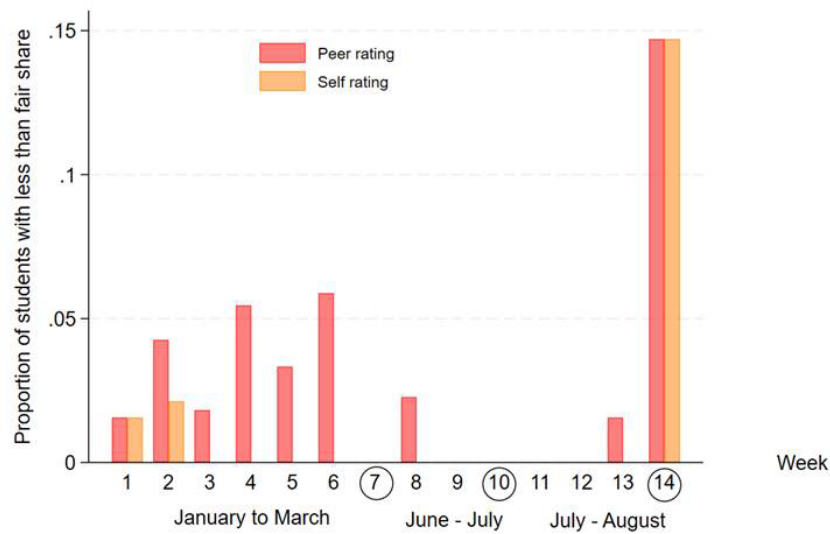


Figure 2 (a). Over time rating: Below the fair share

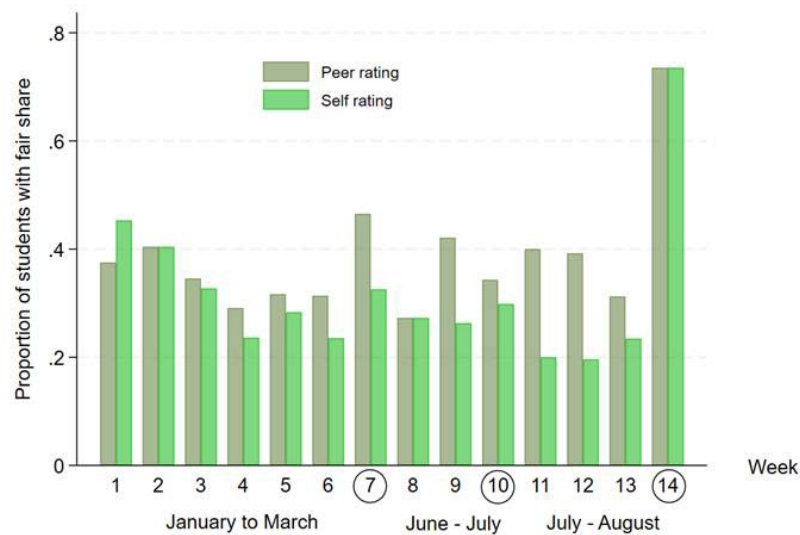


Figure 2 (b). Over time rating: Fair share

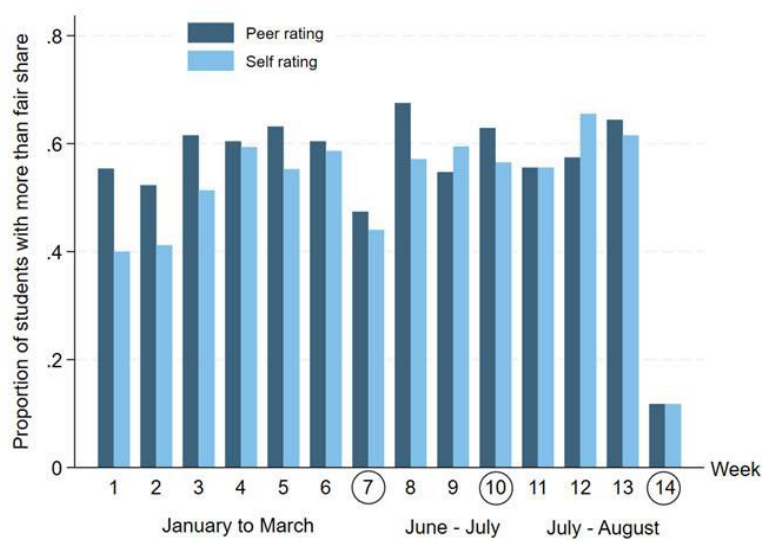


Figure 2 (c). Over time rating: Above the fair share

Figure 2(a), (b), and (c) illustrate the distribution of ratings over time. Although the proportion of students receiving below the fair share during the formative evaluations in Weeks 1–13 never exceeded 6%, approximately 15% of students received below the fair share in the final agreed summative evaluation. Throughout the formative stages, there is a clear tendency for students to rate both themselves and their peers above the fair share; however, this pattern materialises for only 11.7% of students in the final agreed share.

A further pattern emerges in Figure 2(c). Early in the process, the proportion of students self-rating above the fair share is lower than the proportion receiving such ratings from peers. Over time, this gap narrows, with self-ratings surpassing peer ratings in several weeks (e.g. Weeks 9 and 12). In the next section, we investigate this pattern using regression analysis to examine whether higher peer ratings contribute to increased self-confidence over time, as reflected in rising self-ratings.

METHOD AND ESTIMATION

Rather than relying on simple correlations, which capture association without accounting for confounding factors, we estimate a regression model to examine whether peer ratings from the previous period help improve confidence, as reflected in students' self-ratings. With 68 students observed over 14 time periods, we construct a panel dataset of self- and peer-ratings, where peer ratings are measured as the average rating received from all peers within a group in a given period.

Because engagement and confidence may be influenced by time-invariant unobserved individual characteristics, such as motivation, a fixed effects estimator is used to address potential endogeneity arising from omitted variables and to support causal interpretation. In addition, the self-rating outcome has three ordered categories, below the fair share, fair share, and above the fair share, necessitating an ordered logit specification. The resulting fixed effects ordered logit model estimates the probability of a student self-rating below, at, or above the fair share as a function of lagged peer ratings.

Equation (1) presents the regression specification, following Baetschmann et al.¹⁶

$$self\ rate_{it} = \beta_0 + \beta_1 peer\ rate\ above_{it-1} + \beta_2 peer\ rate\ above_{it-2} + (\alpha_i + u_{it}) \quad (1)$$

where,

$$self\ rate_{it} = \begin{cases} 1, & \text{if below fair share at period } t \text{ for individual } i \\ 2, & \text{if fair share at period } t \text{ for individual } i \\ 3, & \text{if above fair share at period } t \text{ for individual } i \end{cases}$$

and peer rate above is a categorical variable with

$$peer\ rate\ above_{it} = \begin{cases} 1, & \text{if peer rate is above fair share at period } t \text{ for individual } i \\ 0, & \text{otherwise} \end{cases}$$

The term u_{it} denotes the idiosyncratic error, while α_i captures individual-specific, time-invariant unobserved fixed effects such as motivation. Together, these form the composite error term in Equation (1). The fixed effects estimator uses time-demeaned data and thereby drops any time invariant effect (here α_i), leaving only the time-demeaned idiosyncratic error term. This term is uncorrelated with the explanatory variables, satisfying the exogeneity condition.

We include up to two lags of peer ratings, i.e., ratings from the previous two periods, to explain self-rating behaviour. This specification minimizes the Akaike Information Criterion (AIC) and is therefore preferred.

Table 2 reports the marginal effects of lagged peer ratings on self-ratings, estimated using a fixed effects ordered logistic regression.

	<i>Peer rate above_{it-1}</i>	<i>Peer rate above_{it-2}</i>
<i>Self rate below_{it}</i>	-0.033** (0.013)	-0.042*** (0.012)
<i>Self rate fair_{it}</i>	-0.326** (0.135)	-0.414*** (0.121)
<i>Self rate above_{it}</i>	0.359** (0.148)	0.456*** (0.133)
Observations	150 (IDs 25)	

Standard errors in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table 2. Marginal effects of lagged peer-rating on self-rating estimated using Fixed Effects ordered logistic regression

Unlike coefficients from linear regression models, the coefficients from Equation (1) cannot be interpreted directly as marginal effects. Instead, marginal effects must be calculated for each category of the dependent variable, representing the change in the probability of self-rating below, at, or above the fair share.

As shown in Table 2, the probability of self-rating above the fair share increases by 36% when the peer rating in the previous period was above the fair share, and by 46% when the peer rating two periods earlier was above the fair share. These increases occur relative to the probabilities of self-rating at or below the fair share. Correspondingly, the probabilities of self-rating a fair share and below the fair share decrease by 33% and 3%, respectively, when the peer rating in the previous period was above the fair share, and by 42% and 4%, respectively, when the peer rating two periods earlier was above the fair share.

Given the visible and invisible diversity within groups, it is plausible that students' confidence improves over time when their work is perceived as highly valued by their peers.

To better understand why some groups agreed on uneven final equity shares, we examine the final period (Period 14) in greater detail. Four of the 14 groups agreed on uneven final shares. Table 3 presents information on these groups, including visible group diversity and students' taught averages.

	Group 2 (Medium visible diversity)		Group 4 (Minimal visible diversity)		Group 8 (High visible diversity)		Group 10 (Medium visible diversity)	
	Taught average	Agreed share	Taught average	Agreed share	Taught average	Agreed share	Taught average	Agreed share
Member 1	77	Above	60	Below	78	Above	68	Above
Member 2	68	Below	64	Below	59	Below	69	Above
Member 3	64	Below	75	Above	69	Fair	60	Below
Member 4	64	Below	60	Below	68	Above	61	Above
Member 5	64	Below	69	Above	62	Below	-	-

Table 3. In-depth on groups with mixed final equity share

A notable pattern emerges from Table 3; students who received above the fair share in the final agreed evaluation tend to be high achievers within their groups. This may reflect that high-achieving students invest more effort, while lower-achieving students may be willing to allocate greater responsibility to them in order to maximise the overall group mark. Importantly, this pattern holds irrespective of the level of visible diversity within the group, such as gender or country of origin.

Reassuringly, these mixed final equity shares do not appear to be driven by lower engagement with the formative weekly evaluation system. Responses from the end-of-year survey indicate strong engagement, as summarised in Figure 3. The most frequently cited reason for participation was that students were following instructions, indicating compliance and consistent engagement. This was followed by the incentive built into the design, namely that the evaluations affect final grades.

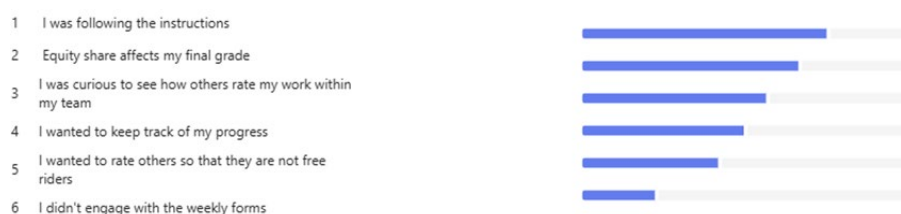


Figure 3. Ranked reasons for engagement with the learning tool

DISCUSSION AND CONCLUSION

Consistent with O'Connell et al.,¹⁷ we find that the use of FeedbackFruits facilitates early identification of teamwork issues through regular monitoring, without increasing staff workload. Our findings differ from those of Lu and Hoek:¹⁸ rather than students rating themselves higher than their peers, we observe the opposite pattern for many students, particularly in the early stages.

We attribute this difference to task design. Lu and Hoek¹⁹ analyse three teamwork settings within a single module and term, with random group allocation for each task. In contrast, our design spans multiple terms and is explicitly structured to foster a relational contract among team members.²⁰ Similar to Planas-Lladó et al.,²¹ our design incorporates an agreed equity share that affects final grades. A key distinction, however, is that we use learning analytics to enable students to agree on equity shares before the teacher assigns marks. As a result, students distribute shares under incomplete information about final grades, which encourages calibration, dialogue, and sustained incentives throughout the process.

As shown in Table 3, the most likely reason for agreeing on unequal equity shares appears to be prior academic performance, aligning with the findings of Khatoon.²²

Our equity share incentive - where individual contribution translates the group mark into an individual mark (see Khatoon²³) - is conceptually similar to FeedbackFruits' group contribution factor, although we have yet to examine the differences between the two approaches. While such mechanisms are claimed to reduce free-riding in teamwork,²⁴ we argue that careful task design and prior student training are essential for establishing a relational contract.²⁵ Future research could directly compare these functionalities.

Finally, in line with Hui,²⁶ we find that FeedbackFruits enables tracking of individuals across different team settings, providing flexibility to test the implications of alternative group formation strategies. We plan to explore this dimension further in future research.

NOTES

¹ Dennis L. Sun, Naftali Harris, Guenther Walther, and Michael Baiocchi. "Peer assessment enhances student learning: The results of a matched randomized crossover experiment in a college statistics class." *PloS one* 10, no. 12 (2015): e0143177.

² Rabeya Khatoon and Elinor Jones. "Flipped small group classes and peer marking: incentives, student participation and performance in a quasi-experimental approach." *Assessment & Evaluation in Higher Education* 47, no. 6 (2022): 910-927; Uchswas Paul, Ananya Mantravadi, Jash Shah, Shail Shah, Sri Vaishnavi Mylavarapu, M. Parvez Rashid, and Edward Gehringer. "Scaling Success: A Systematic Review of Peer Grading Strategies for Accuracy, Efficiency, and Learning in Contemporary Education." *arXiv preprint arXiv:2508.11677* (2025).

³ Ángel Fidalgo-Blanco, María Luisa Sein-Echaluce, Francisco J. García-Peñalvo, and Miguel Ángel Conde. "Using Learning Analytics to improve teamwork assessment." *Computers in Human Behavior* 47 (2015): 149-156.

⁴ Ángel Hernández-García, Emiliano Acquila-Natale, Julián Chaparro-Peláez, and Miguel Á. Conde. "Predicting teamwork group assessment using log data-based learning analytics." *Computers in Human Behavior* 89 (2018). 10.1016/J.CHB.2018.07.016.

⁵ <https://feedbackfruits.com/>

⁶ Chris Campbell, Lenka Borer, and Sheila McCarthy. "Enhancing feedback with FeedbackFruits: Scaling for transformative implementation." *ASCILITE Publications* (2020): 322-327.

⁷ Nhi Nguyen. "Transforming collaboration with technology-enhanced peer learning".

<https://feedbackfruits.com/use-case/transforming-collaboration-with-technology-enhanced-peer-learning> (2024).

⁸ Dan Hasan. "From peer assessment to teaching excellence at Imperial College London". <https://feedbackfruits.com/use-case/from-peer-assessment-to-teaching-excellence-at-imperial-college-london> (2023).

⁹ Nhi Nguyen. "Optimising the flipped classroom and group assessment at Monash University". <https://feedbackfruits.com/use-case/optimising-the-flipped-classroom-and-group-assessment-at-monash-university> (2022).

¹⁰ Nigel J. Francis, Caroline Pritchard, Zoë Cariad Prytherch, and Stephen Rutherford. "Making teamwork work: enhancing teamwork and assessment in higher education.." *FEBS Open Bio* (2024). 10.1002/2211-5463.13936.

¹¹ Banihashem et al conducted a systematic review linking formative assessment with learning analytics and highlighted its role in reflecting on 'where the student is now', 'where the student is going', and 'how the student is getting there' from the teacher, peer and self-evaluations perspective. Our research demonstrates a stronger application potential of the learning analytics tool in shaping trust among team members, boosting self confidence in a diverse environment, and thereby creating a fair negotiation ground for effective teamwork; Seyyed Kazem Banihashem, Dragan Gašević, Omid Noroozi, Halszka Jarodzka, Desiree Joosten-ten Brinke, and Hendrik Drachsler. "Optimizing formative assessment with learning analytics." *Review of Educational Research* (2025): 00346543251370753.

¹² Unlike Darvishi et al, our example case uses a light touch formative peer and self-evaluation of teamwork where the students are not directly rating submissions, rather contributing to weekly monitoring and goal setting tasks; Ali Darvishi, Hassan Khosravi, Shazia Sadiq, and Dragan Gašević. "Incorporating AI and learning analytics to build trustworthy peer assessment systems." *British Journal of Educational Technology* 53, no. 4 (2022): 844-875.

¹³ Probably the closest learning tool as ours is used in Lu and Hoek, though the activity design and the incentive structure is different; Yu Lu and André van der Hoek. "Decoding Student Rating Behaviors: A Comparative Study of Frequent Self and Peer Assessments in Team Projects." In *Proceedings of the 33rd ACM International Conference on the Foundations of Software Engineering*, pp. 912-923. 2025.

¹⁴ Rabeya Khatoon. "Relational Contracts and Equity-Based Reward in Teamwork: Theory and Evidence from Higher Education". Work in progress (2026).

¹⁵ Similar to Ohland et al, our weekly evaluation scale included different criteria that aligns with the work in different phases of the dissertation, not all of them were applicable in each week. However, given the focus of the paper, we used overall rating here in our analysis; Matthew Ohland, Misty L. Loughry, David J. Woehr et al. "The Comprehensive Assessment of Team Member Effectiveness: Development of a Behaviorally Anchored Rating Scale for Self and Peer Evaluation." 11 (2012). 10.5465/AMLE.2010.0177.

¹⁶ Gregori Baetschmann, Alexander Ballantyne, Kevin E. Staub, and Rainer Winkelmann. "feolgit: A new command for fitting fixed-effects ordered logit models." *The Stata Journal* 20, no. 2 (2020): 253-275.

- ¹⁷ Brian Patrick O'Connell, Kathryn Schulte Grahame, Richard Whalen, Constantine Mukasa, and Susan F. Freeman. "Fruitful Endeavors: Continuous Peer Feedback to Develop Positive Team Dynamics." In *2025 ASEE Annual Conference & Exposition*. 2025.
- ¹⁸ Yu. "Decoding Student Rating Behaviors". 912-923.
- ¹⁹ Yu. "Decoding Student Rating Behaviors". 912-923.
- ²⁰ See Khatoon. "Relational Contracts" for details.
- ²¹ Anna Planas-Lladó, Lidia Feliu, Gerard Arbat, Joan Pujol, Juan Jose Suñol, Francesc Castro, and Carolina Martí. "An analysis of teamwork based on self and peer evaluation in higher education." *Assessment & Evaluation in Higher Education* 46, no. 2 (2021): 191-207.
- ²² Khatoon. "Relational Contracts".
- ²³ Khatoon. "Relational Contracts".
- ²⁴ Keo Mokgojoa, and Rebecca LeBoeuf. "Why Group Member Evaluation is important for Business Schools." (2020). <https://feedbackfruits.com/blog/why-is-group-member-evaluation-important-for-business-schools>
- ²⁵ Khatoon. "Relational Contracts".
- ²⁶ Bowen Hui. "Design guidelines and research directions for team analytics." *The International Journal of Information and Learning Technology* (2022). 10.1108/IJILT-07-2022-0147.

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PRESENT CONTINUOUS: LIBERATION STRATEGIES IN THE UNIVERSITY

Authors:

ADAM GIBBONS, TARA LANGFORD

Affiliation:

UNIVERSITY OF THE ARTS LONDON, UNITED KINGDOM. LEEDS BECKETT UNIVERSITY, UNITED KINGDOM

INTRODUCTION

“Without basic needs being met, students have little chance of succeeding academically”¹

In this paper, we will outline why and how we are using and adapting activities and systems from Nonviolent Communication (NVC) in our work in creative higher education.

Since we began teaching around 20 years ago, we have observed our universities to be sites of dynamic social, cultural, and political relations, hemmed into increasingly rigid interfaces of compliance.

In meeting the aims of modularised curricula and its deliverables, we strive to fulfil shared satisfaction metrics for the course community, though often without attunement to the present. Through student and staff surveys, course committees, all staff meetings, and corridor interactions, we observe staff and students struggling to integrate their expectations of learning; layered professional requirements; and perhaps crucially, sustained wellbeing.

As we have come to learn through our experience, and is underscored emphatically in NVC, lack of sustained wellbeing is one basis for building unsustainable systems, a space of asymmetrical compromises that ultimately leads to resentments and exhaustion, “we no longer just work, we perform”.² It is from traversing this landscape that our development of Communication, Collaboration and Shared Leadership practices departs.

In order to embed a structure of wellbeing in teaching and learning activities, we draw on methods informed by Nonviolent Communication techniques.³ Working with NVC has supported us to name and navigate some of the complexities of learning interactions, spaces and systems, that are inflected by how we all arrive to them: our positionality and previous experiences. We explore ways to amplify and nurture marginalised positions and provide a setting for community building, curiosity, and dynamic reflection. We will talk about how we’ve adapted NVC methods for an art and design context and integrated them into the curriculum, and how these processes are ongoing.

By acting on the interconnection between needs for wellbeing, connection, and expression (as defined in NVC), and reflecting on decolonising analyses of Maslow’s hierarchy of needs,⁴ notably, that self-actualisation and creativity work in tandem with our physiological needs, senses of belonging and self-esteem, and not apart from them, NVC activities help to contextualise, inform and mobilise our understanding of the studio space and its participants, in identifying, naming, and centring our needs.

Context: From the ground

In 2015 at London College of Communication UAL, we had the opportunity to build an undergraduate course curriculum from the ground up—the course title is BA Design for Art Direction. In designing an active space for engagement, we centred our curriculum on interdisciplinary and collaborative practices, something that can be challenging for undergraduate participants.

As we formed a critical curriculum of Art Direction, what became increasingly intrinsic to defining its practices, was the activation of the relationships between content, container, means, and distribution in visual cultural terms. Participants from non-dominant backgrounds—potentially those more aware of systemic frames—achieved very highly from the early stages of the course. By the time we reached our second graduating cohort, we had statistics that students working from marginalised positions were much more likely to achieve a first-class award than those from dominant cultures and backgrounds, resulting in a rare positive awarding gap. Something was working, but many things were not.

The interrelated challenges around student recruitment; zero-hours contract staffing; fluctuating budgets; precarious access to learning spaces, tables and chairs; systemic uncertainty such as strikes/lockdown teaching; the pressures of meeting key performance indicators, whilst trying to foster a rich and supportive environment for students and staff to flourish, had us in frustrating territory.

We heard students' dissatisfaction with the complexity of the course aims, their issues with staff approaches, and their wider university experiences, whilst seeing the high-quality, critically engaged work they were producing. Graduate outcomes exceeded our expectations, but the community was not in great shape.

In the increasing tension between the consumer markets agreement; the Office for Students' mandates; underfunded former polytechnics; and the escalating cost of keeping the lights on and upgrading software licences, we sometimes feel that we have to fix problems that are much bigger than us. These problems include the spiralling cost of living; London rent increases;⁵ a general decline in mental health;⁶ the financial pressures borne by students and their families; the inequalities within student groups; and real terms pay cuts for university employees.⁷

*"We may unwittingly collude with structures of domination because of the way learning is organized in institutions."*⁸

It was from these conditions that we as a team began our Nonviolent Communication training and began to see the possibilities of how using NVC, which at its core has roots in liberation and resistance movements, could nurture a more open communication space to re-humanise our environment.

Nonviolent Communication

NVC is a system of communication with the goal of increasing compassion and connection, named and developed since the 1970s by Marshall Rosenberg and first published in 1999, citing the work of Martin Luther King Jr and Mahatma Gandhi as central to its methodology. NVC is often adapted by its certified trainers, and our trainer, Ceridwen Buckmaster, is open about her adaptations of NVC whilst being "true to its essence".

There have been attempts to decolonise NVC, including a workbook publication, Decolonizing Non-Violent Communication.⁹ It has also been crucial for us to draw on overlapping ideas and practices from other forms of facilitation and teaching, including the influence of Augusto Boal's *Games for Actors and Non-Actors*,¹⁰ as well as concepts from theoretical texts by Sara Ahmed, Edouard Glissant, Fred Moten & Stephano Harney, and Aruna D'Souza. Using these activities, games, and concepts, interweaves our creative education to our real-world contexts:

"Rather than embodying the conventional false assumption that the university setting is not the "real world" and teaching accordingly, the democratic educator breaks through the false construction of

the corporate university as set apart from real life and seeks to re-envision schooling as always a part of our real world experience, and our real life."¹¹

One of the fundamental NVC approaches uses a simple four-step model of *Observations, Feelings, Needs, and Requests*, to support people to maintain connection with others whilst expressing their needs or receiving feedback.

Step 1 Observation: How can you describe what's happening in order to build a shared reality?

Step 2 Feeling: How do you feel about this observation? What do you feel in your body?

Step 3 Need: What need comes up for you from this observation?

Step 4 Request: What can you ask for as a first step towards meeting the need that's important for you?

To support us to answer these questions, NVC materials include lists and cards of feelings and needs, which are basic but powerful tools to identify more accurately what we are feeling and needing. This draws on other neurobiological work about the relationship between language and regulating our feelings, as a practice of mindfulness *name it to tame it*. There is also an agreement to speak from "I" as much as possible, (antithetical to many academic traditions).

Moving from this basic four-step framework, there are various methods; role-plays; workshops; and activities which can be practiced with participants, to apply the principles of NVC to a range of situations—many of which, such as collaboration and group work, and offering and receiving critical feedback—are useful to art and design students and tutors.

In order to nurture diversity of thought, experience and perspective, there are other four-step processes developed by our trainer that open a container for those who think and feel differently, to be heard and contribute. This is a helpful and clear way to avoid groups reaching a consensus too early through social norms, and see ways that conflicting feelings, needs, and strategies need not escalate to violence or confrontation, but allow us to hold multiple truths simultaneously.

There is emphasis here on not "answering" what has been shared and disrupting the formulation of judgements by other members of the group, by echoing back what has been said accurately, "what did we hear?", not "what do we think?".

Responding with something we might want to share about our experience is the last step of the process, by which time diverse perspectives have been integrated into the group's narrative.

NVC gives us a way to rehearse collaborative methods.

We were able to embed the processes and active reflections from NVC in our course sessions and tutorials. As our confidence grew, it showed up in our project briefs, modules, and course revalidations, handbooks and learning outcomes. The "it" was the active participation in, and naming of, power dynamics and asymmetries, and the layered "life space" (gestalt¹²) that comes into the studio with us.

It gives participants greater confidence in their experiences from which to begin to centre their work authentically. It supports generative co-creation, where narratives, concepts and images are constructed by multiple people. Contributions come through the four-step framework and are kept alive by the formulations of requests and seeking divergent perspectives. This helps students move through sticky impasses, not choosing one thing over another, or one person over another, but modulating the process itself, (not necessarily seamlessly).

The structures of NVC help us to systematise our approach to student-centred learning, particularly in situations when we might feel under-resourced, tired or disconnected, when biases and blind spots show up. Instead of relying on naturally occurring empathy, resonance, preference, or bias, we have a structure to access in different situations. We are not perfect, and treating people if not equally, then equally well is simultaneously a necessity, a hope, and a challenge.

Resourcing Ambiguity (case study)

Since we first began receiving NVC training in 2021, we've taken several approaches to introduce these methods to students and to embed them in the curriculum.

One of these approaches, at course level, has been to introduce cross-year, off-site, day-long workshops which we call Communication, Collaboration and Shared Leadership Bootcamp for Happier Times, a tongue-in-cheek title we use to couch the activities in a context of employability, and to begin to define our emerging practice.

Students from all years and course staff are invited to spend a day together developing their NVC practices with guidance from qualified NVC facilitators. Whilst being introduced to the basic NVC practices of *Observation, Feeling, Need, Request*, students spend time meeting the wider course community; the course team participate in the workshops with them; everyone prepares food and eats together.

During an NVC role-play involving over 100 participants and 6 members of staff at one of the bootcamps for happier times, we were able to see how leadership moves around a group—which became known locally as sharing leadership—this emerged as a new model for talking about leadership as a generative, dynamic, and shared practice, embedded in the course lexicon.

At other times methods developed from NVC are more integrated into regular studio-time practices including *check-ins* at the start of sessions. In this relatively quick grounding exercise participants are invited to 'check-in' with a partner in response to short prompts such as "what are you putting down to be here?", and "what are your hopes for the session?". These prompts can be adapted to be more project-specific to set up a discussion or activity.

Workshops for students to discuss shared *Agreements and Aspirations* are held to establish terms for the community to engage through, bringing out a broad vocabulary of needs identified in peer-led discussions and as a method for sustaining a discussion that centres a connection with needs.

These activities are underpinned by a call for connection between participants and a connection to the present moment—giving participants a *container* to acknowledge "we are here together now"—and to recognise the personhood of fellow participants in the dailyness of curriculum activities.

Opacity?

Whilst these methods can bring benefits, it's important for us to acknowledge their limits, especially in relation to those who are routinely subjected to the dominating, extractivist drive of colonialism, racism, ableism, and sexism.

Aruna D'Souza says: "The refusal of a politics that relies on empathy to build solidarity is, for people of the global majority especially, a matter of self-preservation."¹³

Drawing on Edouard Glissant's *Poetics of Relation*, she states: "The right to opacity stands in opposition to Western ontology's demand for transparency—a demand to know the other (whether an individual or a culture or, in fact, however otherness is being conceptualized in the moment). The West's need to know is never innocent curiosity, and rarely is it a simple desire for entanglement—it almost always takes place within a relationship of domination, and thus whatever knowledge results is essentially derived without real consent."¹⁴

We need to work to decolonialise any practice that again places an uneven burden on people from marginalised positions and makes it "the responsibility of the oppressed to teach the oppressors their mistakes".¹⁵

We're engaged in a conversation about the differences and similarities between compassion and empathy in an attempt to identify what we're working to cultivate here and what we're negotiating in order not to replicate the extractive colonial cycles underlying Western cultures of *transparency* that D'Souza, Glissant and Lorde draw attention to.

Moving forward from inherited ideas around NVC—that the core goal is to cultivate empathy—our practices reconsider community and what can authentically support an ongoing set of relations between participants (interdependence), to shift expectations and cycles that maintain the established hierarchical (codependent) relations.

Inclusive?

We might have always been working on the course’s capacity for the *inclusion* of diverse individuals in a shared programme, but we had perhaps not developed, or even had a sense of, the importance of the connection *between* diverse individuals in a shared programme.

Access can mean a number of things: “‘Access’ in the context of barriers caused by ableism, although these barriers inherently overlap and intersect with barriers caused by racism, homophobia, transphobia, sexism and classism.”¹⁶ access in relation to the background structures surrounding Higher Education, or access in relation to an atmosphere that inhibits or promotes connection between participants.

“One of the challenges in this context is finding the confidence to enable collaborations that are truly creative: those which will result in unexpected outcomes that cannot be fully defined in advance. Such creative collaborations are the sharp edge of innovation, where risks may be higher but so too are potential rewards.”¹⁷

Those of us institutionalised in the ways of creative higher education might be used to the high value placed on terms like, *collaboration*, *risk*, *the sharp edge of innovation*, and *things that cannot be defined in advance*. It was and remains important for us to remember that encounters with these concepts are contingent upon many factors. It is also very possible, and can often be seen very plainly, that the rewards for these kinds of characteristics are much more easily arrived at by those most familiar with creative practice through experiences prior to HE, and those for whom the stakes may not be all that high if they “fail”. The instinct for unpacking, scaffolding, and supporting the role of risk and uncertainty in our curriculum, might have always been present, but the tools to undertake this work rigorously and systemically have felt elusive.

Studies evidence that neurodiverse students can find the traditional classroom settings challenging¹⁸ and unsuitable for meeting their needs.¹⁹ Anecdotal feedback from students supported by course surveys shows students are very positive about community building activities, particularly off-site sessions.

By opening up an alternative kind of activity with the Happier Times Bootcamp, one that takes place away from the regular teaching space, a kind of ‘creative disruption’²⁰ is brought about, introducing different methods than in typical art and design workshops; placing attention on the texture of our interactions; and providing opportunities for community building in ways that aren’t available within the studio in practical or technical sessions.

Sara Ahmed reminds us that: “Concepts are at work in how we work, whatever it is that we do. We need to work out, sometimes, what these concepts are (what we are thinking when we are doing, or what doing is thinking) because concepts can be murky as background assumptions. But that working out is precisely not bringing a concept in from the outside (or from above): concepts are in the worlds we are in.”²¹

Transforming?

NVC takes time. Shared leadership takes awareness which is built up through practice over time. Exploring and becoming familiar with new communication practices needs consistency and willingness. These qualities are likely at odds with the pressured performance-oriented expectations of

fee-paying students looking towards uncertain employment prospects and debt, and academic staff struggling to resource their basic activities.

Returning to Yemi Gbajobi's statement quoted at the start of this paper,²² Arts Student Union research conducted at UAL shows that students engaged in community activities do better academically as well as regarding their mental health.

Looking to bell hooks—who has always asserted that community underpins learning—her approach centres the “ways classroom settings can be transformed so the experience is inclusive”.²³ We understand that our attempts to introduce methods for communication and collaboration, and an atmosphere of mutuality, need to amplify our attention around how we are experiencing our interactions in order to benefit from them.

These qualities of connection are hard to arrive at given the space we start an undergraduate journey from. Many students are nervous of the idea of the group, of the strangers in their group, and that these strangers may have a role to play in their learning. Many of us have little experience of the transformative potential of groups and sharing realities.

Connection can be imperfect, even the framework for offering connection can be imperfect. What seems important to us is to move towards the possibility of collectively sustaining such a framework, and in turn a quality of wellbeing that honours ideas of collaboration (and imperfection) in more than just name.

As with the NVC methods we're working with, environmental; temporal; linguistic; and somatic aspects are tilted and mobilised as we explore ways to embed inclusive communication into our curricula. With these multimodal interventions we introduce interruptions to the received conceptions of *getting it right*, of *already knowing*, and of conforming to expectations of *performance*, to set a tone—together with students—that allows the space for imagination²⁴ and experimentation.

Establishing a sense of agency and courage²⁵ are important steps for students to be able to move through the complexities presented to them in more emotionally challenging work. The experience of developing this agency and courage can, in turn, help them to develop critical and creative competencies that can support working through the kind of ambiguities that art and design invite.

NVC's strength for us lies in its application in interpersonal course-related moments. It can be articulated depending on what we ask or sense to be relevant to a person, or group, at a particular time.

An NVC request is a transformative thing to formulate, and it can take a few goes at it to get to the thing that will move the blockage. In so doing we confront ourselves, our judgements, and our othering patterns of thoughts. Participants begin to value connection as a tool - rather than performing and being productive as a move away from connection.

Feedback structures tend to ask the question “How did we do?” at the end of projects, versus developing a culture from the beginning that asks in a present continuous enquiry “what are you/we needing?”. The latter, in NVC terms, asks us to take responsibility for our needs, to resource them by identifying them, and take action including the action of a pause.

NOTES

- ¹ Yemi Gbajobi. 'The Student Experience Jigsaw: Is education enough for student success?'. (UAL Education Conference 2025. 1st July 2025).
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- ⁵ According to the Office for National Statistics report on Private rent and house prices, UK: March 2025 private rent inflation in London was 9.6% in the past year. Office for National Statistics. Accessed 10 November 2025 <https://www.ons.gov.uk/economy/inflationandpriceindices/bulletins/privaterentandhousepricesuk/march2025>
- ⁶ According to the Adult Psychiatric Morbidity Survey: Survey of Mental Health and Wellbeing, England, 2023/4, "the prevalence of Common Mental Health Conditions (CMHCs) among 16–64-year-olds has risen to 22.6% up from 18.9% in 2014". NHS England Digital. Accessed 10 November 2025. <https://digital.nhs.uk/data-and-information/publications/statistical/adult-psychiatric-morbidity-survey/survey-of-mental-health-and-wellbeing-england-2023-24/common-mental-health-conditions>
- ⁷ Data published by UCU in 2021 suggests pay has fallen in real terms by 20% between 2009-2021. University and College Union. Accessed 10 November 2025 <https://www.ucu.org.uk/article/11830/University-staff-pay-cut-by-20-new-figures-show>
- ⁸ bell hooks. *Teaching Community: a Pedagogy of Hope*. (New York: Routledge, 2003). 43
- ⁹ In Decolonizing Non-Violent Communication, meenadchi highlights the suceptability of NVC to abuse within existing power structures, saying "Non-Violent Communication (NVC) is a communication structure and modality that was developed and outlined by Marshall Rosenberg in the early 1970s. It is a practice that is revered in some circles and widely criticized in others. Critiques of NVC are that it is a liberal form of language-policing, that it denies and ignores invisible systems of power and privilege, and that it seeks to homogenize and reduce the flavors of our communication." they go on: "Because our communication is linked to our sense of safety, the utility of NVC will always depend upon the practitioner and the space they hold. This workbook is designed for those who recognize safety in centering queer, Black, Indigenous wisdom and for those who know that safety will come through tangible change in the world and never through words alone." meenadchi, *Decolonizing Non-Violent Communication*, (Co-Conspirator Press 2019) 2
- ¹⁰ Augusto Boal. *Games for Actors and Non-Actors*. (London: Routledge, 1992).
- ¹¹ hooks. 41
- ¹² Kurt Lewin. *Field Theory in Social Science: Selected Theoretical Papers*. 1951. (Reprint, Chicago: University of Chicago Press, 1976).
- ¹³ Aruna D'Souza, *Imperfect Solidarities*, (Floating Opera Press, Berlin. 2024) 52.
- ¹⁴ D'Souza. 52-53
- ¹⁵ Audre Lorde, *Age, Race, Class and Sex: Women Redefining Difference*, (Paper delivered at Copeland Colloquium, Amerst College, April 1980), reproduced in *Your Silence Will Not Protect You*, (London: Silver Press 2017). 95.
- ¹⁶ Kaiya Waerea, *Access Questions for Self-Publishing: a resource* (Pagemasters, 2024), 2.
- ¹⁷ Downie, M., Eshkar, S. and Kaiser, P. (n.d.). Creative Collaborations. [online] Available at: <https://www.helsinkidesignlab.org/files/1191/Creative%20Collaborations.pdf>. 1.
- ¹⁸ Simon Beames, Peter Higgins, and Robbie Nicol. *Learning Outside the Classroom: Theory and Guidelines for Practice* (Routledge, London/New York 2012).
- ¹⁹ Lorna G. Hamilton and Stephanie Petty. *Compassionate pedagogy for neurodiversity in higher education: A conceptual analysis*, Frontiers in Psychology, Volume 14, (2023): DOI: 10.3389/fpsyg.2023.1093290
- ²⁰ Susan Orr and Alison Shreeve, *Art and Design Pedagogy in Higher Education: Knowledge, Values and Ambiguity in the Creative Curriculum*. (London: Routledge, 2017) 101.
- ²¹ Sara Ahmed. *Living a Feminist Life* (Duke University Press 2017). 13.
- ²² Gbajobi, *The Student Experience*
- ²³ bell hooks. *Teaching to Transgress: Education as the Practice of Freedom*. (New York: Routledge, 1994). 35.
- ²⁴ Hooks. 40.

²⁵ Brian Arao and Kristi Clemens, *From Safe Spaces to Brave Spaces: A New Way to Frame Dialogue Around Diversity and Social Justice*, in: Landreman, L.M. (Ed.), *The Art of Effective Facilitation: Reflections from Social Justice Educators*. (Stylus Publishing, LLC; ACPA, Sterling, Virginia: Washington, DC 2013).

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TRAINING ENVIRONMENTAL HEALTH HOUSING PRACTITIONERS WITHOUT ACTIVE WORK EXPERIENCE: CAN VIRTUAL LEARNING USING 360 PHOTOSPHERES OFFER A VIABLE ALTERNATIVE?

Author:

AARON LAWSON, JILL STEWART, PAUL OATT, ROBERT EADIE, ELLIS TURNER

Affiliation:

ULSTER UNIVERSITY, UNIVERSITY OF GREENWICH, UNIVERSITY OF THE WEST OF
ENGLAND, UNITED KINGDOM

INTRODUCTION

There has been a substantial decline in traditional United Kingdom work placements supporting academic programmes developing skills and competencies for front-line professionals/practitioners in local authorities, notably for environmental health (EH) professionals working in regulation and enforcement in areas of housing and health, food safety, environmental protection, health and safety and public health. The decline in the number of work placement opportunities coupled with a declining national shortage of fully trained EH practitioners in recent years has led to seeking new options to help replicate practice and effective new forms of learning needed to best replicate ‘real world’ experience.

The decline in placements has been due to a long-term range of factors, including austerity, with substantial implications for workforce development and retention. Limited information is currently available around the number of staff in training needed, the quality of their training, its affordability to public sector training budgets, the manner in which it might be both offered and how the learning could be assessed and recognised nationally. Similarly, the EH workforce has faced particular practice challenges, including austerity cuts, loss of experienced staff, challenges to accessing funding for recognised training programmes and multiple changes to the regulatory framework. These specifically relate to the ongoing Review of the Housing Health and Safety Rating System (HHSRS),¹ developments in Decent Homes requirements,² new requirements across housing tenures around damp and mould in housing³ and most recently, the new provisions contained within the Renters’ Rights Act 2025.⁴

As such, novel solutions around how EH practitioners (including academics, practitioners and students) learn and are trained must be explored and utilised. The Covid-19 pandemic demonstrated that new modes of learning were both possible and palatable, indeed offering then unforeseen options for those wishing to enter and stay in the profession. It also showed the substantial investment required in new online forms of synchronous and asynchronous learning, and the quality new resources that would need to be developed and assessed to replicate and offer quality learning around ‘real world’ situations. One such novel technology which emerged with the potential to facilitate a

new form of learning and training by replicating ‘real world’ scenarios was 360 technology. During the pandemic and still to this day, 360 technology was used mainly in the area of real estate to host virtual housing viewings for potential buyers and renters. It was also used for social purposes, particularly for outdoor recreation and sport.

There is currently very little research into the development or evaluation of the potential for Environmental Health Practitioner (EHP) learning and practice using 360-technology, despite its potential to showcase real-world environments in various environmental health-related contexts. There have been ongoing challenges to this, including access to funding sources, specialist input, time limits and so on. But, the lessons arising from this have far greater applicability, as the challenges of such training go beyond the traditional face to face classroom learning experience.

This paper aims to evaluate the potential use of novel 360-technology for practice-based learning and training in Environmental Health from a practitioner perspective. The focus in this paper is around the niche area of housing inspection training for environmental health professionals, exploring how we might progress the development and potential roll out of 360 photospheres as part more diverse and accessible training tools and opportunities in the profession though an online survey of relevant EH academics, practitioners and students who might use such an application for training purposes.

METHODS

In order to ascertain the perceptions of EH housing academics, practitioners and students acting as participants in this study towards using 360 photospheres in their learning, we filmed and developed innovative 360 photospheres with ‘real world’ housing condition concerns to explore the potential to support synchronous and asynchronous virtual learning to help deliver learning needs that require multiple, complex areas of knowledge, skills and application. We then developed and piloted our proposed survey entitled ‘*Evaluating the potential for Environmental Health Learning and Practice using 360-technology – a practitioner, student and academic perspective*’. We secured ethical clearance (Ulster University, Computing, Engineering & Built Environment Research Ethics Filter Committee – approval number: CEBE_RE-24-011-B), before sharing our online survey in October/November 2025.

The survey used a mixture of 25 open and closed type questions, illustrated with examples and potential to trial the 360 photospheres using ThingLink, an online platform with this capability. Examples of internal and external housing photospheres we captured and shared through the survey are provided in Figures 1 and 2 below.

[INSERT 360 PHOTOS HERE – INSIDE MAIN BATHROOM]

d. Now look at this image inside the main bathroom of the property. Which environmental health issues can you identify (if any)? Please comment in the textbox below.

e. What could Environmental Health do to address these issues? Please comment in the textbox below.



Figure 1. Photosphere still of inside main bathroom

[INSERT 360 PHOTOS HERE – OUTSIDE FRONT OF PROPERTY]

b. This is the front of the property looking towards the main road – are there any potential nuisances or hazards present here? Please comment in the textbox below.

c. What could Environmental Health do to address the identified issues? Please comment in the textbox below.

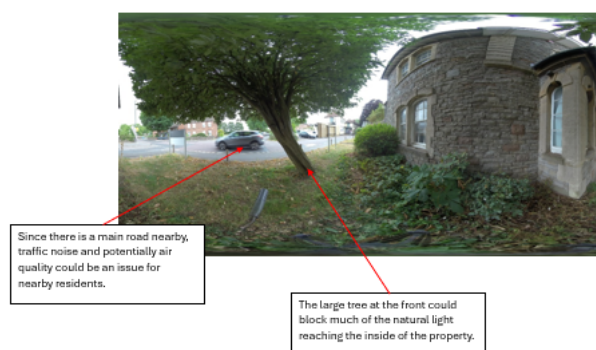


Figure 2. Photosphere still of outside front of property

Illustrative survey questions asked about participants' experience of housing inspection/investigation technique in practice, who provided the training, the link to and understanding of housing deficiencies (cause and remedy), whether they had come across 360 photospheres previously, how this might help their practice and if they felt this would be better than using photographs for learning. Following viewing the 360 photosphere examples, participants were asked to note the advantages and disadvantages for those new to this work and those engaging in Continuing Professional Development (CPD) as a refresher activity. We also asked if participants thought this technology should be freely available to those working in housing regulations and other areas of environmental health where applicable as well as any concerns around this. We also asked for thoughts on how we might build experiential learning into learning when not a requirement of accredited degrees.

Online surveys are a good, cost-effective method of wide but targeted dissemination to recruit and secure completion by relevant participants, providing appropriate instructions on rapid completion and the opportunity to withdraw responses at any stage until a given date.

The survey link was shared with relevant academic, practitioner, network and organisational contacts working in environmental health and housing and was closed 4 weeks after launch when the results were downloaded for scrutiny and analysis.

RESULTS AND DISCUSSION

Results were assessed qualitatively using codes and a 6-phase analysis, entered into Excel, with coding, final codes and subnodes, before sorting into themes arising. These were: Participants background; Application of 360 to Practice-Based Inspections and Distance Learning; Application of 360 to experiential Learning and HHSRS; Perceived Disadvantages of 360 Photospheres; Could 360 Virtual Inspections Replace Physical Inspections?; and Integrating 360 technology Into Local Authority Housing and Environmental Health Applications. These are now presented and discussed.

Participants Background

Most participants (53.3%) were unfamiliar with 360 filming. Those with previous housing inspection experience (37.5%), were mainly university trained, facilitated in-person by an EHP (see table 1). The qualitative feedback shows participants regarded the technology as applicable to academic and experiential learning and evidence gathering for enforcement purposes, not only in housing but across wider environmental health disciplines.

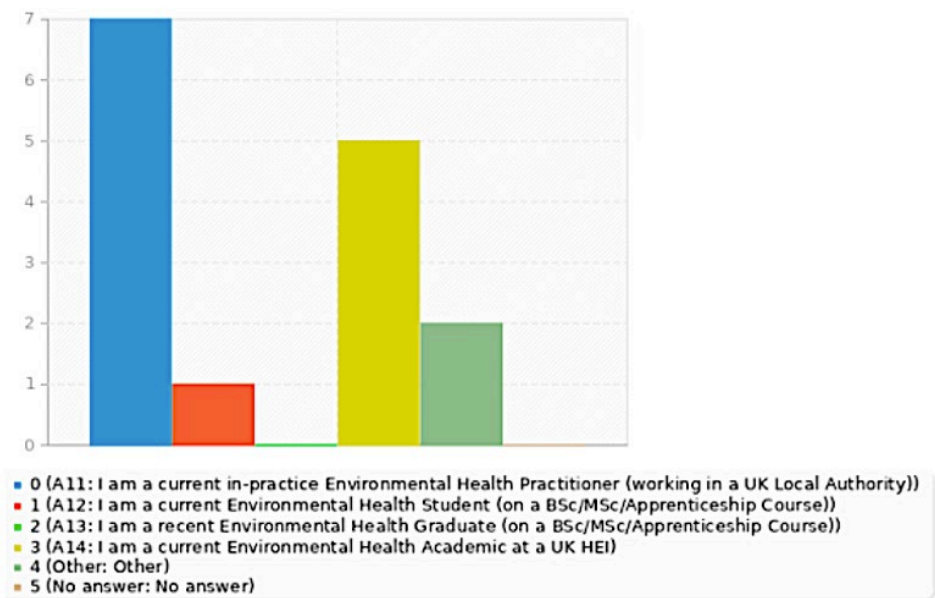


Table 1. Summary of participants current role.

Application of 360 to Practice-Based Inspections and Distance Learning

When asked whether they agreed or disagreed that 360 filming improves practice-based inspections compared to traditional photographs and filming, most participants agreed or strongly agreed that it did (89.3%). See table 2 and illustrated by the following representative quote:

‘It promotes proactive investigation rather than passive receipt of the information on what the problems are with the building. It requires more agency and autonomy by the student. It gives a more

honest feeling of the environment and more trust in what is being shown. It provokes more emotional response in the student. It can be more immersive.’ P12

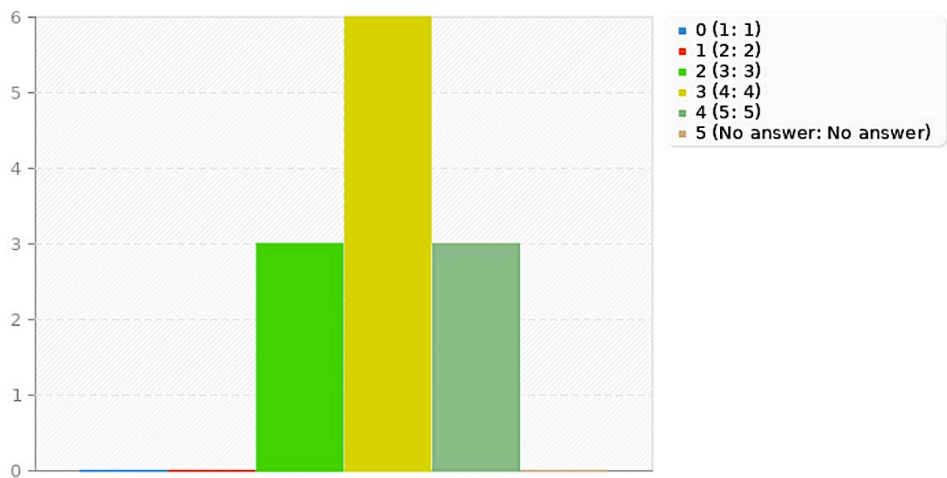


Table 2. Participant responses 1:5 scale, agree or disagree 360 filming improves practice-based housing inspections compared to traditional photographs and filming.

Table 3 shows most participants (92.9%) felt 360 scenarios provide helpful learning for new practice-based colleagues. They were broadly positive about distance learning drawing upon a library resource of 360 filming in lieu of overcoming barriers to arrange student site visits. Participants saw the technology as an enabler for students to examine defects asynchronously without being placed at risk, (P7, P9, P11, P12, P15, P18, P20, P22). With resources tailored to meet specific local authority environments such as areas with high density of Houses in Multiple Occupation (HMO), (P11), and supporting new HHSRS worked examples (P20).

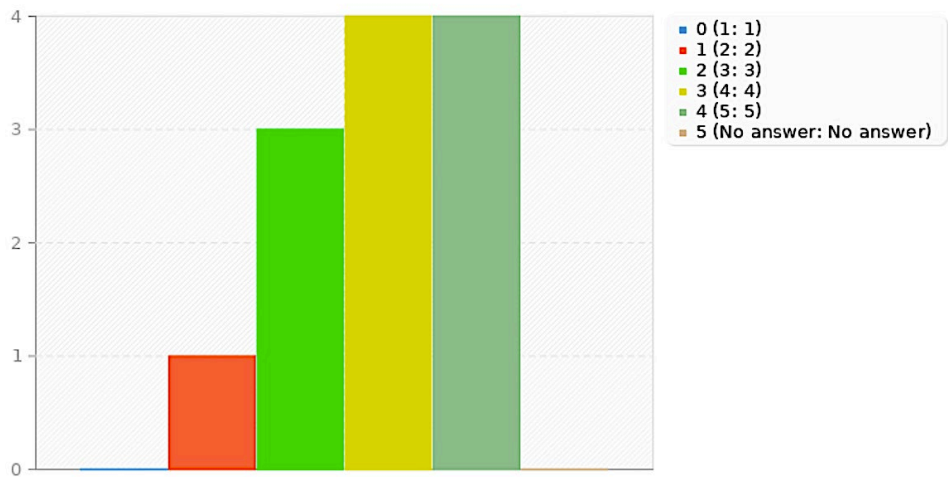


Table 3. Participant responses 1:5 scale on how helpful they think practice-based colleagues might find 360 scenarios for their learning and CPD?

Most of the qualitative feedback on accessing 360-based training for housing inspection revealed that ‘online’ is the preferred choice (P2, P3, P10, P15, P16, P17, P18, P20, P21, P23, P25) followed by using a mobile application (‘app’) (P9, P19, P20, P23, P24). The following quotes are indicative of what we were being told:

‘There is good coverage of the different parts of the property from different angles and showing whole ceilings, walls, floors.’ P18

‘It would allow me to practice in different scenarios, which would help me learn about how to deal with different issues e.g. filthy and verminous dwellings.’ P11

‘It is closer to the experience of being in an actual property and inspecting it. It doesn't require moving the student to the property and has no health and safety concerns for the student so is simple to administer. Easier than taking them out on an inspection.’ P12

Application of 360 to experiential Learning and HHSRS

For experiential learning and HHSRS training, participants considered the technology applicable to different housing scenarios particularly when encountering difficulties facilitating inspections owing to availability of live cases and difficulties arranging for the shadowing of experienced officers, which is resource intensive, placing added pressures upon staff (P7, P9, P11, P12, P15, P18, P20, P21), particularly because ‘employers are getting less willing to train and mentor new professionals,’ (P18). Another perceived advantage of using 360 photospheres for housing inspection revealed: - It ‘saves time’ (P2, P6, P8, P9, P16, P26) and inspections can be revisited virtually instead of physically, (P4, P14, P16, P20, P22, P23).

Participants felt using the technology allows for more time spent reviewing inspections in more detail, enabling users to develop confidence and improve upon observational and hazard-spotting skills, (P11, P12, P13, P15, P19). Two participants felt that annotations within imagery should not be too explicit, thus enabling students to draw their own conclusions rather than be led, (P12, P21). But distinctions should be made between issues arising from deficiencies or occupiers’ behaviour, (P20).

Participants felt virtual learning cannot convey certain realities of live inspections where inspector’s decisions are informed by sensory perceptions of odours and sounds, (P7, P11, P12, P18, P22, P26) and the following quotes help demonstrate some of the shortfalls, for example:

‘If you are visiting for damp and mould, you really need to feel it unless you can give detailed humidity levels.’ P22

‘There is no sense of smell or sound to indicate for example damp or leaks. The inspector cannot take measurements or samples.’ P18

Provision of data on weather conditions, temperature and humidity levels is important for informing decision making, a further limitation is there being no opportunity to interact and ask questions, (P14, P22). Therefore, participants were inquisitive as to what wider information might be available, for example: *‘Will you get the detail on temperature, weather conditions etc? If you are visiting for damp and mould, you really need to feel it unless you can give detailed humidity levels,’ P22.*

Perceived Disadvantages of 360 Photospheres

There were perceived disadvantages of using 360 photospheres for housing inspection revealed concerns over poor imagery, lack of detail and inability to inspect closely, (P1, P4, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P20, P21). The following quote is an example of this:

‘The disadvantage is that blurry images and unclear instructions on how to navigate the photosphere could cause confusion and even disengage learners.’ P11

Poor image quality, whether poorly taken or through software issues, (not being able to display imagery in 360) was concerning to participants because poorly rendered, images cannot convey the full impact of identified defects (P11, P12, P14). There is also the potential for IT/technical errors to occur (P16, P22, P23, P25). This together with poor instructions on ‘navigating the photosphere’ potentially discourages learners (P11, P12).

In addition, concerns were flagged about opportunities to really engage with this technology, for example:

‘There is less ability to get close up to specific things, open cupboards, lift loo seats etc for a thorough inspection...The inspector cannot take measurements or samples.’ P18

As well as being unable to measure or open and lift, the tool was criticised for not having adequate zoom function for closer scrutiny (P12, P22).

Potential disadvantages were also flagged as to who else may create the photospheres in practice and whether these might be comprehensive enough. For example:

‘Environmental issues could be easily missed if we relied on other(s) to do the videos and send these to us.’ P26

‘The person taking the photosphere may deliberately miss out certain areas.’ P18

In addition to concerns about deliberate omission another potential limitation is accidental omission whereby cameras potentially gloss over defects when panning (P18, P26). One participant observed that close photographs lose ‘position context’ whereas with 360 filming there are no issues ‘understanding where images are from and how they relate to one another,’ (P20). The issue of ‘real world’ surveys and inspection was preferred:

‘When an appeal or prosecution occurs, I will always want and trust a physical visit from an officer for an assessment,’ P26.

Could 360 Virtual Inspections Replace Physical Inspections?

Participants regarded virtual inspections as supplementary to other support materials and did not feel the technology could supplant physical inspections or provide equivalent experiential learning levels compared to live inspections, particularly where witnesses are required to recall conditions for evidential purposes. Participants viewed the technology as having a supporting role in the same way that photographs are exhibited (P7, P11, P15, P18, P21, P22, P23, P24, P26).

One participant revealed they are already exploring how to make the technology more immersive through virtual simulation ‘wearing goggles,’ (P14), another participant was wary that headset use could potentially generate simulator sickness believing it would not be an issue when viewing on a screen, (P12).

Most participants (86.7%) felt that 360 technologies should be freely available to local authority teams working in housing regulation and other areas of Environmental Health where applicable.

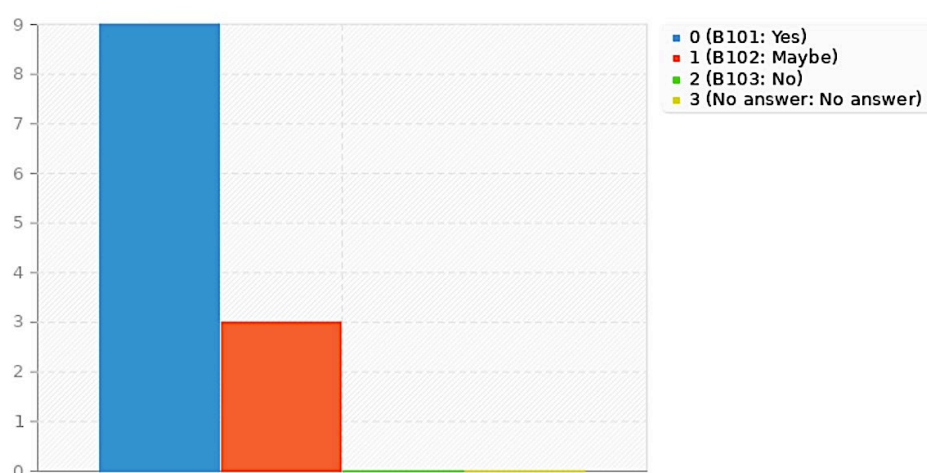


Table 4. Participants response to whether 360 filming should be freely available for local authority housing and environmental regulatory usage

Integrating 360 technology Into Local Authority Housing and Environmental Health Applications

In local authority settings the tool was considered a useful enhancement for use in inductions and housing inspection skills development (P11, P12, P18, P20, P21, P22, P24) or refreshing existing skills or used for calibration exercises to ensure consistency in risk assessment (P9, P12, P21, P22). The following quote is indicative of what we were being told:

‘The inconsistency of live cases means that planning and opportunity to observe the wide range of defects to hazards is difficult. Shadowing can be resource intensive and put pressure on the team,’ P20.

Most participants also reported qualitatively that the use of 360 could have wider application to other environmental health disciplines such as food, health and safety or environmental protection (P1, P5, P6, P7, P9, P11, P12, P13, P14, P15, P18, P20, P21, P22, P23, P24, P26), or for use in Planning Applications (P13). In a broader context P12 felt it could be used to illustrate conditions in refugee camps or housing in low-income settings.

Another potential use identified by participants was filming properties for evidential purposes, that could subsequently be reviewed, prior to formal action to ensure, continuity of evidence through accurate recording without omission, (P23, P24, P26). For example, we were told:

‘It looks useful though for gathering evidence of an offence. It is more of a visual experience than a photo.’ P23

The possibility of using the technology live with student officers mentored remotely by a guiding senior officer was also considered viable (P12).

Participants also felt the technology could be integrated into EHP registration pathways such as learning portfolios and interviews, (P18, P21, P23). Most participants (44.4%) felt that 360 scenarios like this would be helpful for CPD training for new practice-based colleagues. Some (37.0%) said it ‘maybe’ would.

CONCLUSION

This work is still experimental and in early stages and has not been attempted or researched previously in environmental health applications, notably for housing inspection purposes or wider regulation and enforcement. Development has been further hampered by our inability to secure funding and other resources to help us progress this further. However, as the results indicate, there is certainly growing interest in how we can explore the development of photospheres in housing inspection and refresher update work, both for initial training in housing surveys and investigations in developing key skills and competencies, but also in CPD activities as refreshers and for new regulatory developments. In reviewing feedback from each stage of development, we have gradually been able to develop this further and consider how it might be used in training and potentially in formative and summative assessments, both synchronously and asynchronously. There is still a long journey ahead in creating a viable resource capable of substantial impact and wider applicability in supporting the training needs of front-line environmental health practitioners, but there is much interest in this area and how it might work.

One of the potential new applications is around practitioners themselves being trained in creating their own evidence trail in actual cases, providing for greater capture and presentation in the event of regulatory enforcement. Longer-term we hope to continue to develop this work and roll it out to other areas of environmental health practice, continually informed by reflection and amendment as appropriate through feedback gained.

NOTES

¹ Department of Levelling Up, Housing and Communities, *Summary Report: Outcomes and next steps for the review of the Housing Health and Safety Rating System (HHSRS)* (London: DLUHC, 7 September 2023, Accessed January 22, 2026, Summary report: outcomes and next steps for the review of the Housing Health and Safety Rating System (HHSRS)

² Ministry of Housing, Communities and Local Government, *A reformed Decent Homes Standard for Social and Privately Rented Homes Consultation* (London, MHCLG, 2025), Accessed January 22, 2026, A Reformed Decent Homes Standard for Social and Privately Rented Homes Consultation - Ministry of Housing, Communities and Local Government - Citizen Space

³ Ministry of Housing, Communities and Local Government, Department of Health and Social Care and UK Health Security Agency, *Understanding and addressing the health risks of damp and mould*, (London, MHCLG, DHSC and UKHSA, 2004, Accessed January 22, 2026, Understanding and addressing the health risks of damp and mould in the home - GOV.UK

⁴ Ministry of Housing, Communities and Local Government, *Guide to the Renters' Rights Act 2025*, Accessed January 22, 2026, Guide to the Renters' Rights Act - GOV.UK

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GAMIFICATION OF CHINA'S MATERIAL CULTURAL HERITAGE: A CASE OF "DIGITAL LIBRARY CAVE"

Author:

JIE CAI

Affiliation:

HONG KONG METROPOLITAN UNIVERSITY, CHINA

INTRODUCTION

Conventionally, gaming has been dismissed as a frivolous pursuit, a perception rooted in a reductive view that confines the medium to mere hedonistic leisure. This outlook overlooks the profound pedagogical potential of games and their significance as a socio-cultural phenomenon. However, a transformative shift is underway as cultural practitioners increasingly adopt digital games—once perceived as antithetical to tradition—as sophisticated instruments for cultural preservation. This approach enables audiences to engage with historical narratives and ideological values through immersive emotional experiences, thereby dismantling long-standing stigmas. The Digital Library Cave project exemplifies this paradigm shift.

The Digital Library Cave, a strategic collaboration between the Dunhuang Academy and Tencent, is an innovative digital heritage preservation project accessible to both domestic and international markets. It integrates the spatial, historical, and artistic dimensions of the Mogao Grottoes into an immersive, interactive narrative framework. This article focuses on exploring how Digital Library Cave, as a new media platform, balances entertainment and education through game design in the innovative transmission of tangible cultural heritage. It analyzes the underlying structure of the game design to provide valuable reference insights for ensuring the effective dissemination of the connotations and values of cultural heritage while incorporating contemporary culture that resonates with young audiences.

EXPLORING NEW METHODS OF DISSEMINATION

Currently, the promotion of intangible cultural heritage in China predominantly employs scholarly publications, museum curation, and formal educational curricula. For instance, the Palace Museum in Beijing disseminates academic periodicals such as the Palace Museum Journal, Forbidden City magazine, and Palace Museum Studies to facilitate scholarly communication and cultivate a comprehensive understanding of the architectural, artistic, and cultural significance of the heritage site. The Emperor Qinshihuang's Mausoleum Site Museum employs immersive exhibitions to effectively portray the archaeological and cultural attributes of the Terracotta Army to the public. Within the formal education system, cultural heritage knowledge is typically integrated into textbooks and history courses to foster awareness and appreciation among students. While traditional methods of transmission can effectively convey basic information about history and culture, they are essentially one-way communication models. In contrast, innovative approaches that combine cultural

heritage with modern video games not only offer more diverse and interactive experiences but also attract the attention and interest of contemporary Generation Z.¹

In cultural heritage, multimedia interactive dissemination and gaming effectively address societal needs. China's game market reached 350.789 billion yuan by December 2025.² Modern interactive digital entertainment surpasses mere amusement, serving as a complex expressive medium with narrative and self-referential features. These phenomena act as influential cultural discourse vectors, aligning with McLuhan's medium-as-extension hypothesis, which states that media enhance human experiential and communicative abilities.³ Analogous to telephony and social media, interactive entertainment increasingly impacts cognition, cultural development, and education through its psychological and societal influence.

In fact, games are pervasive across human civilization, spanning from primitive behavioral expressions to mythological narratives, ritualistic practices, and social structuring activities, thereby highlighting the potential interconnection between cultural development and game theory.⁴ Following the emergence of complex societies, games acquired specific social and psychological functions, such as fulfilling innate instincts, facilitating cathartic release, and satisfying psychosocial needs. When conceptualized within a social functional framework, the evolution of cultural heritage games can be systematically traced, as games serve not only as interactive activities but also as mechanisms for educational transmission and ideological reinforcement within societal contexts. The immersive nature of interactive digital entertainment mitigates the cognitive load associated with traditional passive pedagogical approaches in contemporary youth, thereby fostering increased voluntary engagement with innovative pedagogical paradigms. Additionally, specific design elements inherent to gamification effectively facilitate the transmission of historical, cultural, and educational content, aligning with the objectives of the cultural heritage sector to promote both knowledge dissemination and entertainment-based learning.

The advantages of gaming experiences are: they allow us to escape our original living spaces and immerse ourselves in a realm that is both fictional and real; players' emotions, minds, experiences, and insights undergo complex changes and are even reshaped as they play the game; and the reproducibility and malleability of games maintain a broad space for game development and market appeal; even after a game ends, its influence on people does not disappear, but rather continues to take root in our thoughts and daily world.⁵

GAME DESIGN OF DIGITAL LIBRARY CAVE

The game employs an intuitive, user-centered interface grounded in the historiography of the Dunhuang Mogao Grottoes' Library Cave, converting archival manuscripts into interactive digital narratives through integrated storytelling and gameplay mechanics. It incorporates visually compelling graphics and streamlined mechanics, facilitating accessibility for users across all age groups, including beginners. The application delivers an immersive, multisensory educational experience, representing an innovative methodology for disseminating historical knowledge and enhancing user engagement within digital heritage preservation.

Narrative Transformation

Cultural heritage games are essentially a process of digitally translating and mechanically reconstructing historical materials. While their foundation is rooted in historical records, their presentation transcends traditional documents, shifting towards visual and interactive media expression. Digital Library Cave uses Cave 17 of the Mogao Grottoes in Dunhuang as its historical background. Discovered on May 26, 1900, the cave contained over 60,000 artifacts, including Buddhist scriptures, social documents, and silk paintings. However, after its opening, it was

repeatedly looted by foreign explorers, resulting in a significant loss of Chinese cultural heritage. The game spans 2342 years, unfolding its narrative around key historical moments of the Digital Library Cave: starting with the reasons for its opening, a debate among three NPCs reveals the reasons for its closure, and incorporates three current academic hypotheses. This design respects historical accuracy while incorporating contemporary research, demonstrating a fusion of historical authenticity and cutting-edge scholarship.

Role-playing

Role-playing techniques enhance narrative depth by enabling participants to adopt culturally specific personas, thereby advancing plot development and fostering personalized engagement. In the context of the Digital Cave module, users select from six character archetypes inspired by iconography from the Dunhuang Mogao Grottoes, including the "Guiding Bodhisattva" silk painting, the "Lady of the Governor Paying Homage to Buddha" from Cave 130, and donor figures from Cave 61. These personas, conceptualized as secondary creative constructs rather than canonical figures, are distinguished through unique vocal performances. From an experiential standpoint, the variation in vocal tonality and subtle facial expressions significantly increases emotional immersion and addresses basic gender and costume preferences. However, from an educational perspective, the role-playing mechanics exhibit limited effectiveness in conveying historical and cultural knowledge, as system feedback remains largely uniform regardless of the chosen persona. Consequently, these role-playing elements predominantly function as a means of first-person immersion within the Dunhuang context, rather than as a pedagogical instrument for targeted historical instruction.

Game Mechanics

Game mechanics, integral to game design, are embedded implicitly and variably, requiring players to discover them via interaction. Goal-setting underpins mechanic-driven gameplay: in Digital Library Cave, players act as witnesses to cave seals and cultural relic rescuers, bearing a historical mission. This imbues tasks with significance, positioning players as "actors" in the narrative. Each stage highlights the importance of player actions, facilitating knowledge absorption within a goal-oriented environment, with potential cross-application to daily understanding. Player interactions influence mechanics, leading to differentiated behavioral tendencies. Richard Bartle's typology includes achievement, exploration, social, and killer players.⁶ In Digital Library Cave, achievement players target specific goals like 100% exploration or 500 points; exploration players seek hidden clues and artifact cards; social and killer players emphasize interpersonal experiences and competitive stimulation, respectively.

Game mechanics are fundamental in calibrating gameplay systems, encompassing rules, objectives, and player engagement metrics. Digital Cave constructs its interactive architecture through a strategic integration of environmental design elements, goal hierarchy, character development frameworks, itemization systems, and progression mechanics. This structural hierarchy facilitates the effective transmission of Dunhuang's historical and cultural narratives while sustaining player engagement via consistent feedback loops within the mechanical system. Ultimately, these interconnected systemic components serve to optimize user experience by translating complex heritage data into accessible digital interactions.

Players' Agency

Games serve as potent tools for skill acquisition and educational outcomes; however, they concurrently regulate player engagement through programmed controls. Autonomous player-centric titles like Minecraft afford high degrees of agency, whereas culturally focused heritage games—such

as those centered on Dunhuang—are systematically designed to steer learning processes in accordance with pedagogical goals. Christian Fuchs' critique of digital platforms frames user participation as a form of surplus labor, facilitating capital accumulation. In commercial gaming contexts, this labor is monetized through increased gameplay duration. Conversely, heritage-focused games emphasize the transmission of cultural knowledge, wherein player effort—though resembling unpaid work—facilitates cultural preservation and understanding, exemplified by immersive insights into the Mogao Caves and Dunhuang's spatial history, thereby aligning user engagement with the preservation and dissemination of cultural heritage.

Procedural Rhetoric

Ian Bogost's "procedural rhetoric" models games as a distinct social medium, emphasizing their interactivity and societal influence beyond entertainment. It employs game procedures to persuade players of specific ideas.⁷ Drawing on Roland Barthes' notion that any material can serve narration, games utilize their unique programming to influence players.⁸ Bergster classifies procedural rhetoric into "program" and "rhetoric," noting that the game program is often concealed. In *The Digital Library Cave*, the program is exemplified by "predetermined missions," where players act as witnesses to history—neither participators nor insiders—gaining cultural insights about Dunhuang heritage as modern viewers.

The game development employs a fixed chronospatial framework to ensure historical verisimilitude. Utilizing a unidirectional, linear progression centered on the Library Cave, the system guarantees players remain within the designated narrative trajectory. This structured progression immerses users in a sequence of interconnected historical events, thereby preventing narrative divergence. To bolster this immersive experience, Tencent applied millimeter-precision digital scanning technology to digitally reconstruct historical environments with high fidelity. A notable example is the 1:1 scale digital reproduction of the Sanjie Temple, which, although physically extant no longer, was meticulously recreated through the integration of archival documentation and research conducted by the Dunhuang Academy. This synthesis of historical data and advanced 3D modeling exemplifies how digital game design can serve as a medium for the preservation and dissemination of intangible cultural heritage and vanished material artifacts.

The Digital Library Cave employs the game's unique procedural content generation algorithms to encode and disseminate cultural knowledge, thereby facilitating the preservation of intangible cultural heritage. This methodology effectively enhances user engagement, promoting affective involvement, experiential cognition, and interpretative understanding. Consequently, participants may exhibit enduring attitudinal modifications towards cultural heritage artifacts, resulting in increased propensity for protective and conservation-oriented behaviors beyond the interactive environment.

Narrative Rhetoric

While the procedural mechanics of a video game establish its logical architecture, they may lack engagement without the integration of rhetorical devices. In this context, rhetoric encompasses the strategic use of language, imagery, and music to craft an immersive narrative experience. *Digital Library Cave* exemplifies this by integrating a first-person linear gameplay trajectory with a circular narrative structure. Although the plot advances chronologically to facilitate player comprehension, the cyclical framework ensures the narrative continually revisits the Library Cave as its central motif.

This circular narrative evokes a sense of destiny, reinforcing the player's previously established sense of mission. Furthermore, the game's setting in ancient Dunhuang—deeply rooted in Buddhist tradition—utilizes Zen-inspired dialogue to cultivate a contemplative atmosphere that draws players into its virtual world. A central narrative element, the "Guiyijun Yafu Jiupoli" serves as a vital

primary source for analyzing the political, economic, and cultural landscape of the era. While traditional archival study of such ledgers may be perceived as monotonous, the game revitalizes this information through animation. By employing artistic elements such as color, form, and rhythmic pacing, the design enhances the ledger's expressive appeal. This transformation highlights the significance of rhetoric in creating a vivid and engaging environment that bridges the gap between historical documentation and contemporary digital interaction.

The Digital Library Cave exemplifies Bergster's framework of procedural rhetoric, employing game mechanics and rhetorical strategies to communicate knowledge and values pertinent to cultural heritage preservation. It orchestrates an influence mechanism by disseminating ideological constructs, creating an immersive environment that cultivates emotional engagement and underscores the importance of safeguarding cultural patrimony.

BALANCING ENTERTAINMENT AND EDUCATIONAL FUNCTIONS

The primary objective of the project is the transmission of the cultural heritage embodied in the Dunhuang Mogao Caves. However, the Library Cave's 2,000-year history presents a significant challenge: disseminating vast historical and textual corpora without inducing cognitive overload in the user. To maintain engagement, the design must strategically leverage the inherent motivational mechanisms of digital play. In this scholarly context, entertainment transcends mere hedonism; instead, it refers to the psychological gratification derived from a structured user experience. By integrating a calibrated progression of challenges and obstacles, the design sustains player interest and extends the duration of engagement. Ultimately, an effective heritage game must evoke deep affective resonance, transforming static historical data into a dynamic, rewarding, and interactive narrative journey.

In his seminal analysis of play, Roger Caillois posits that play must be intrinsically voluntary and uncertain; once an activity becomes compulsory or excessively regulated, it forfeits its ludic essence.⁹ In the realm of cultural heritage gaming, there is often a reductive tendency to prioritize pedagogical functions at the expense of entertainment. However, such games can only foster profound immersion and facilitate effective knowledge acquisition if they satisfy the player's ontological demand for play. By nature, games elicit a dynamic spectrum of affective fluctuations—including excitement, tension, and the gratification of mastery. These responses provide users with a sense of novelty and self-efficacy, ensuring that the experience remains engaging while simultaneously achieving its broader educational objectives.

While Digital Cave prioritizes gamification and enhanced engagement, it lacks a critical attribute central to ludic design: replayability. James Paul Gee posits that video games function as an interactive language—a semiotic system that integrates diverse multimodal symbols through a recursive cycle of input and output.¹⁰ Within this linguistic framework, the depth of the dialogue between the player and the game is sustained by the potential for varied outcomes and exploratory agency across multiple playthroughs. However, constrained by its linear and predetermined narrative, Digital Cave offers a singular experience that, once completed, provides little incentive for re-engagement. This absence of replayability suggests that while the project succeeds as a powerful one-time pedagogical statement, it has yet to fully harness the recursive potential inherent in games as a dynamic semiotic language.

In this communicative cycle, players function as the primary recipients of input, while the game's structural design constitutes the systemic output. A compelling experience facilitates the encoding of historical information into the long-term memory of these users. A pertinent example is the 2019 collaboration between the Palace Museum and Tencent, which resulted in the mini-game *The Palace Museum: Pocket Craftsman*. Targetting a younger demographic, the project integrates architectural

construction with pedagogical content. By synthesizing the enduring mechanics of Snake and Sokoban, the design embeds architectural details and cultural motifs into the gameplay as discoverable semiotic clues.

Unlike more linear narratives, its replayability is driven by calibrated challenge. As difficulty scales, the increased cognitive and ludic effort required to achieve specific objectives enhances the sense of psychological reward. This progressive difficulty curve prevents engagement stagnation, ensuring that the output of cultural knowledge remains tethered to a compelling and recursive cycle of player agency and action.

In the design of tangible cultural heritage games, entertainment serves as a fundamental catalyst for user attraction, with replayability and strategic challenge acting as essential mechanisms to sustain engagement. The primary goal of such game design is to elicit affective responses, thereby enhancing the game's overall appeal. However, an overemphasis on pedagogical content at the expense of playability often results in player attrition. To avoid this, a successful cultural heritage project must strike a sophisticated balance between ludic engagement and educational value. By ensuring that a game first achieves widespread recognition through its entertainment quality, designers can create a more effective platform for fulfilling long-term cultural and educational objectives.

EFFECTS AND EVALUATION

Tencent data reveals that during the initial launch week of Digital Dunhuang, over 14,000 users engaged with the mini-program, with 400,000 exhibiting deep interaction, and total exposure reaching 6.2 billion across 20 platforms, including Weibo, Bilibili, and Douyin, resulting in 3.8675 million user interactions.¹¹ Bilibili reviews commend the project's digital innovation, meticulous design, cultural promotion, and positive user reception, while IGN China awarded an 8/10 rating to Digital Library Cave, acknowledging its overall excellence despite minor shortcomings.¹² These metrics underscore the increasing recognition of Digital Library Cave as a culturally significant gamified heritage preservation initiative, highlighting digital gaming's potential to challenge stereotypes and expand cultural dissemination. Nonetheless, current digital innovations remain predominantly textual; though animation and film serve as new visual mediums, they do not fundamentally alter narrative frameworks. Mini-games largely replicate conventional museum activities, underscoring the necessity for further creative differentiation and innovation within cultural heritage gaming.

The "online games+" integration framework garners scholarly interest due to its capacity to augment social functionalities and revitalize cultural heritage sectors.¹³ Industry convergence, propelled by technological innovation, has evolved on a global scale through advancements in digital technology, with digital gaming serving as a pivotal component by delivering economic dividends, fostering social engagement, and satisfying spiritual aspirations. Notably, online gaming platforms facilitate interactions with tourism industries, offering transient, leisure-oriented experiences comparable to tourism activities, exemplifying the convergence of digital entertainment and leisure economies. Digitally mediated adaptations of intangible cultural heritage—such as mortise and tenon woodworking joints and shadow puppetry—have attained recognition, evidenced by high user ratings (e.g., a 9.1 score on TapTap), whereas games rooted in tangible cultural heritage remain absent from prominent rankings. Despite evident success, the development pipeline for tangible heritage-themed digital games remains embryonic, predominantly driven by governmental initiatives and public service motives, with substantial commercial potential yet to be fully realized. Realizing tangible cultural heritage in gaming necessitates overcoming technical, professional, design, and financial barriers. Strategic collaboration among game developers, cultural institutions, and governmental agencies is imperative to effectively incorporate tangible heritage elements into digital gaming,

thereby advancing cultural conservation, stimulating economic development, and enhancing the artistic and cultural qualitative attributes of game content.

CONCLUSION

In conclusion, the Digital Library Cave game functions as a novel digital medium that integrates entertainment and educational objectives through its specialized gamification mechanics, serving as an innovative conduit for preserving Chinese cultural heritage. This study applies pertinent theories and methodologies from game studies to analyze the underlying structural framework and cultural implications embedded within the game design, highlighting the role of digital gaming in cultural preservation and offering practical insights for the development of analogous culturally-sensitive interactive media within China.

NOTES

- ¹ Charlotte Reka and Jianzhong Zhang, "Gamification: Media Consumption Trends of Generation Z" [游戏化：Z世代的媒体消费趋势], *Young Journalists* [青年记者], no. 15 (2021): 93.
- ² Game Publishing Committee of CADPA (GPC), "China Game Industry Report" [中国游戏产业报告], December 26, 2025, <https://www.cadpa.org.cn/3271/202512/41766.html>.
- ³ Qi He, "On McLuhan's View of Games as Media" [试论麦克卢汉的游戏媒介观], *Journal of News Research* [新闻研究导刊] 9, no. 23 (2018): 138.
- ⁴ Johan Huizinga, *Homo Ludens: A Study of the Play-Element in Culture* [游戏的人：文化中游戏成分的研究], trans. He Daokuan (Guangzhou: Huacheng Publishing House, 2017), 41.
- ⁵ Huizinga, *Homo Ludens*, 49.
- ⁶ Richard Bartle, "Hearts, Clubs, Diamonds, Spades: Players Who Suit MUDs," *Journal of MUD Research* 1, no. 1 (1996): 19.
- ⁷ Ian Bogost, *Persuasive Games: The Expressive Power of Videogames* (Cambridge, MA: MIT Press, 2007), 28–29.
- ⁸ Roland Barthes, "Introduction to the Structural Analysis of Narratives," in *Image-Music-Text*, trans. Stephen Heath (London: Fontana Press, 1977), 79.
- ⁹ Roger Caillois, *Man, Play and Games*, trans. Meyer Barash (Champaign, IL: University of Illinois Press, 2001), 9–10.
- ¹⁰ Jing Sun, *Games Change Learning: Game Literacy, Critical Thinking and Future Education* [游戏改变学习：游戏素养、批判性思维与未来教育] (Shanghai: East China Normal University Press, 2018), 24.
- ¹¹ "Case Study of 2023 Effie Awards Gold Winners (II)" [2023艾菲金奖案例分析（二）], *Digitaling* [数英网], May 8, 2024, <https://www.digitaling.com/articles/1072063.html>.
- ¹² IGN China, "Cloud Travel Dunhuang - Digital Library Cave Review: 8/10" [云游敦煌·数字藏经洞评测：8分], IGN China, April 18, 2023, <https://www.ign.com.cn/digitallibrarycave/43767/review/yun-you-dun-huang-shu-zi-cang-jing-dong-ping-ce-8-fen-ign-zhong-guo>.
- ¹³ Meng Cheng, "A Review on the Integrated Development of Intangible Cultural Heritage and Online Games" [非物质文化遗产与网络游戏融合发展评述], *Gehai* 3 (2022): 36, <https://doi.org/10.3969/j.issn.1007-4910.2022.03.009>.

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GRAMMAR OF TRUTH AND LIES: TEACHING WORD CLASSES THROUGH FAKE NEWS

Authors:

RITA COSTA & MADALENA TEIXEIRA

Affiliation:

UNIVERSIDADE DE AVEIRO/CIDTFF, PORTUGAL

INTRODUCTION

Recent transformations in information production, dissemination and consumption — driven by the internet and social media.¹ — present new challenges for language teaching. The rapid circulation of digital content requires advanced reading and linguistic analysis skills, enabling students to understand, interpret and critically evaluate information.² Fake news underscores the need for practical linguistic competences to recognise mechanisms of false or manipulated content. However, Grammar teaching often treats word classes through decontextualised identification tasks,³ which are often perceived as unmotivating.⁴ Thus, we propose integrating word class instruction with fake news analysis, using authentic communicative situations to explore grammar's role in building informational credibility while developing critical literacy.

The article comprises: an introduction, theoretical framework, methodological description (including the intervention), presentation and discussion of findings, and concluding reflections.

THEORETICAL FRAMEWORK

Grammar Teaching, Fake News and the School's Role in Forming Critical Citizens

Grammar lies at the heart of language, serving as a “means of access to knowledge”.⁵ Its teaching must not be reduced to memorisation; rather, it should emphasise understanding grammar in authentic contexts, as it relates directly to quality of life and the exercise of full citizenship.⁶

Grammar and text are inseparable - grammatical mechanisms underpin textual coherence and cohesion, allowing students to “make judgements of syntax, style and linguistic appropriateness”.⁷ Hence the principle that “everything that is grammatical is textual and vice versa”,⁸ which supports teaching grounded in work both on and for the text.

However, classroom practice has often been associated with decontextualised memorisation-based methods, leading to demotivation and resulting in academically weak outcomes.⁹ As an alternative, proposals have emerged “in favour of an approach that moves from intuitive knowledge of language towards the systematisation of principles and rules”,¹⁰ such as Text/Discourse Pedagogy and the Grammar Laboratory,¹¹ which promote an investigative approach based on authentic examples.

Grammar teaching should thus transform implicit knowledge into explicit understanding via reflection on actual language use.¹²

This contextualised perspective is especially relevant in the digital era. While digital tools broaden information access, they also facilitate the spread of fake news (FN). Young people, immersed in

online environments,¹³ are particularly susceptible, often struggling to assess content critically.¹⁴ This study adopts Alba Juez and Mackenzie's "non binary" conception:¹⁵ FN is not simply false, but a distorted or manipulated account of true events. Addressing FN in education requires developing news literacy skills in source evaluation,¹⁶ analysis and critical thinking. Importantly, the linguistic features of fake news present a meaningful opportunity for grammatical development, notably in the study of word classes. Teachers can therefore harness FN as a resource for reflective language work, simultaneously advancing grammatical competence and responsible digital citizenship.¹⁷

Towards an Articulation between Language, Grammar and Persuasion

The analysis of fake news in the classroom constitutes an authentic context for the teaching and learning of grammatical content, aiming for textual meaning to be "constructed in language and through language",¹⁸ according to the communicative situation and objectives.

Several studies conducted in the field of fake news detection algorithms have highlighted systematic differences in linguistic style,¹⁹ namely the use of intentional lexical choices, such as adjectives, verbs and nouns,²⁰ in the construction of the "message" and its persuasive dimension. Rashkin et al.²¹ point to the predominance of superlatives and adverbs of manner. In other words, the manipulation of information reaches its "peak" when word classes become generators of hate speech, impelling the reader to react through specific lexical choices.

Thus, the critical linguistic analysis of fake news serves a dual purpose: on the one hand, it enables the identification of disinformation, and on the other, it fosters metareflection. The potential to promote reflection on language and on the effects of lexical choices in the construction of textual meaning can undoubtedly make students more aware of how they express themselves and of what they "consume" — a central goal of language education.²²

More than merely identifying specific word classes in a text, it is essential to understand the functions they perform. In this sense, the analysis of fake news constitutes a privileged space for reflection on language and its "real" uses, with significant social implications. By doing so, students demonstrate knowledge of "appropriate lexical usage and its inherent semantics";²³ it therefore becomes important to discuss intentionality, which is dependent on context and communicative purpose.

METHODOLOGY AND PEDAGOGICAL INTERVENTION

Methodological Choices

This study adopts a qualitative approach, as it seeks to understand educational phenomena in real contexts.²⁴ Given that the central aim of this research is to analyse the didactic potential of fake news for the development of students' grammatical competences, this approach was considered appropriate for capturing the interpretations and meanings constructed during the pedagogical intervention.

The choice of a Case Study approach is justified by the possibility it offers for conducting an in-depth analysis of a specific educational context, in relation to the phenomenon of fake news. In other words, context and phenomenon are inseparable²⁵. The flexibility that characterises this method²⁶ was another determining factor, as it allows the sessions to be adjusted according to the needs identified throughout the process.

Characterisation of the Participants

The study was conducted in a Year 4 class in Primary Education, comprising 22 students (12 female and 10 male), aged between 9 and 10 years, all of Portuguese nationality.

Description of the Teaching Sessions

The intervention was carried out over nine sessions. In this section, we focus on those sessions that are directly related to the objectives of this study: (i) to understand the relationship between grammatical competences — word classes — and the analysis of fake news; and (ii) to analyse the didactic potential of fake news.

Sessions 1 and 2 – 180 minutes

Students analysed two new pieces (one fake news item and one genuine news report), shown in Figure 1 and Figure 2, respectively, working in small groups and using a grid containing key elements for assessing the reliability of the textual content. They also identified the word classes present in both news items and discussed the credibility of the information, as well as the emotions associated with their respective readings.



Figure 1. News Item A (fake news)

Victoria Nicole consegue melhor participação de sempre de Portugal na Eurovisão Júnior

A participante portuguesa de 14 anos recebeu 213 pontos, arrestando o segundo lugar. O troféu foi conquistado pela Geórgia.

Lusa
17 de novembro de 2024



Corinne Cumming/EBU

Portugal conquistou no sábado o segundo lugar na final do Festival Eurovisão Júnior, que decorreu em Madrid, com a canção *Esperança*, interpretada pela cantora luso-venezuelana Victoria Nicole, revelou a União Europeia de Radiodifusão.

Segundo a organização, esta foi a melhor participação de sempre de Portugal na Eurovisão Júnior, com Victoria Nicole a receber 213 pontos, numa final conquistada pela Geórgia, com o cantor Andria Putkaradze e a música *To My Mom*, que somou 239 pontos.

A terceira canção mais votada foi *Hear me now*, de Artem Kotenko, pela Ucrânia.

De acordo com a página oficial do Festival Eurovisão Júnior, Victoria Nicole nasceu na Venezuela e vive em Portugal com os pais desde 2018.

Victoria Nicole, de 14 anos, representou Portugal na Eurovisão Júnior depois de ter vencido este ano o programa televisivo de talentos "The Voice Kids Portugal". A final da 22.ª edição do Festival Eurovisão Júnior aconteceu em Madrid e contou com a participação de concorrentes de 17 países.

Figure 2. News item B (genuine news report)

Sessions 3 and 4 – 180 minutes

A further comparative analysis of different texts was conducted (Figure 3 and Figure 4), focusing on the frequency and on the classes and subclasses of nouns, verbs and adjectives, as well as their respective degrees. The concept of fake news was formally introduced and linked to the importance of using specific word classes as linguistic strategies of manipulation, drawing on real examples. The sessions concluded with an interactive fake news identification game developed on the Slido platform, in which students mobilised their knowledge of word classes as a central strategy for recognising linguistic markers of information manipulation.

NOTÍCIA A

"Crianças muito pequenas que passem muito tempo a jogar videojogos podem atrasar as competências de leitura ou de escrita"

Os telemóveis são, hoje em dia, quase um prolongamento do corpo. As novas gerações crescem cercadas por ecrãs e soam constantes alarmes sobre os riscos desta exposição. O tempo que as crianças dedicam aos dispositivos digitais contraria, de forma clara, as recomendações da Organização Mundial da Saúde (OMS). Paralelamente, os conteúdos aos quais os mais novos estão expostos são, muitas vezes, desadequados ao seu nível de desenvolvimento.

Em todo o mundo, pediatras, psicólogos e cientistas debruçam-se sobre o tema e alertam que as crianças estão mais agitadas e têm mais dificuldade em estarem atentas. Assinalam ainda que os problemas relacionados com a linguagem e a aprendizagem são cada vez mais comuns (...), referindo que estes aspetos estão relacionados com o excesso de exposição aos ecrãs.

Pedimos ao médico e neurocientista Nuno Sousa que nos ajudasse a perceber o impacto que o uso dos dispositivos digitais tem na saúde e no desenvolvimento. O neurocientista alerta que "se o uso dos smartphones e dos videojogos por parte das crianças for excessivo e acontecer em fases muito precoces, há alguma evidência que aponta no sentido de haver um aumento de casos de défice de atenção."

Total de palavras: 211

Figure 3. News item A (genuine news report)

NOTÍCIA B

🚨 **CHOCANTE!** 🚨 Crianças que jogam videogames estão a PERDER a capacidade de ler e escrever! Os especialistas estão em alerta máximo! Os telemóveis tornaram-se um perigo silencioso para os mais novos! Novas descobertas revelam que milhares de crianças que passam tempo nos ecrãs estão a sofrer danos devastadores e irreversíveis na sua capacidade de aprender!

Além disso, os conteúdos a que as crianças são expostas são muitas vezes inadequados e muito prejudiciais. Novos estudos alarmantes revelam ainda que há um aumento preocupante de problemas na aprendizagem e na linguagem, diretamente ligado ao uso excessivo de videogames e telemóveis. O neurocientista Nuno Sousa reforça: "O défice de atenção pode aumentar drasticamente se as crianças forem expostas a videogames demasiado cedo!"

🔴 Médicos exigem ação imediata! Atenção, pais! Limitem já o uso de videogames antes que seja tarde!

Total de palavras: 136*Figure 4. News item B (fake news)***Sessions 5 and 6 – 180 minutes**

Working in pairs, students rewrote a fake news item, making it more objective. The activity followed the stages of planning, drafting and revision, focusing on reflection upon lexical and grammatical choices associated with textual credibility.

Session 7 – 180 minutes

The different groups produced posters entitled “How to Identify Fake News?”, both as a way of mobilising the knowledge developed throughout the sessions and as a way of disseminating this information within the school community.

Data Collection Techniques and Instruments

Data collection was based on documentary techniques, drawing on the analysis of audio recordings, analysis grids completed by the students, written texts produced during the intervention, and the final posters. The use of multiple instruments ensured a more in-depth and rigorous data analysis. Informed consent was obtained from parents or guardians prior to the intervention.

Data Analysis Procedure

Data analysis followed the content analysis technique (Amado, 2000). Written and oral responses were examined with the aim of identifying emerging categories that enabled the organisation and interpretation of the data. In order to ensure anonymity, codes were assigned to participants: letters to identify students (Student A, Student B), numbers for groups (G1, G2), and numerical codes for texts (#1, #2). Audio recordings were transcribed using the Sembly AI application.

PRESENTATION AND ANALYSIS OF RESULTS

Regarding the comparative analysis of two news items (one fake news item and one “genuine” news report), carried out in Sessions 1 and 2, all groups were able to identify the themes of both news items, as well as their respective authors and source (in the case of the fake news item, since the other report did not present an explicit source), providing expressions that supported their answers. The addressee dimension was the one that generated the greatest disparity of responses in both news items. Nevertheless, students sought to justify their answers not only on the basis of textual elements, but also by drawing on their understanding of the context in which the news item was produced.

With regard to the category “elements that cause doubt or strangeness”, particularly in relation to the fake news item, all groups mentioned the publication date of the news (1st of April), as well as the

alleged date of circulation of the currency featuring Cristiano Ronaldo (30th February 2030). Consequently, the majority of students considered News Item A (fake news) to be not credible. The source was discussed as one of the aspects influencing the credibility of news items, particularly in the case of social media (the source of the fake news presented), as illustrated by comments such as “Facebook is not a credible source” (Student K) and “if I go to Google, I feel I will find the truth more quickly than if I go to TikTok” (Student M). Emojis present in the fake news item were also identified as factors influencing the credibility of the news. Regarding the feelings elicited by each news item, a clear contrast emerged: News Item A (fake news) was associated with feelings of indignation and anger, whereas News Item B (genuine news report) elicited more “positive” feelings, such as joy and gratitude.

When faced with the second comparative analysis of two news items, now addressing the same topic - the consequences of video games for children’s reading and writing skills - with News Item B constituting a fake news item, students demonstrated an understanding that the content of the two news items was essentially the same, but presented in different ways. News Item A was associated with the value of “truth”, whereas News Item B (fake news) was understood as “exaggerated”. With regard to the reasons for this distinction, students explicitly pointed to word classes, stating that the nouns, verbs and adjectives used conveyed different intentions in each news item: “News A is longer, but it expresses things more calmly. News B is a bit shorter, but it expresses things more quickly. As if they wanted us to read everything very fast” (Student M). Students also referred to graphic and visual features (bold type, capital letters and emojis) and punctuation (exclamation marks) present in the fake news item as factors contributing to the distinction between the two news items.

When the concept of fake news was introduced and the main linguistic strategies involved were discussed, students mentioned, in addition to emojis, “adjectives” (Student V), as well as “nouns and verbs” (Student E), as strategies for eliciting different reactions in readers: stress and nervousness (Student M) and “panic” (Student E) in News Item B, and “calm” (Student V) in News Item A.

The fake news identification game developed using the Slido platform revealed that all the excerpts presented were identified as examples of fake news. However, those statements that were in fact intended to exemplify fake news registered a higher percentage of responses in this direction (between 85% and 95% of students, compared to 55% to 60% in the case of the remaining examples). In the discussion that followed the activity, students once again referred to adjectives and verbs as central word classes in the excerpts presented, depending on the intended purpose: to inform versus to alert or exaggerate.

With regard to the fake news rewriting activity, students produced reformulation proposals that reveal a concern with ensuring the credibility of the news item, thereby demonstrating a greater dominance of grammatical knowledge related to word classes. It was observed that the largest number of changes made in relation to the original version concerned the class of verbs. In particular, there was frequent transformation of present tense verbs (e.g. *aumentam* “increase” and *têm* “have”) into verb forms invoking the modal verb *may/might*, with the aim of conveying a value of possibility.

In other cases, students resorted to the negation of the facts presented, with the intention of contradicting the content of the news item. With regard to the class of adjectives, the expression “the games are the best tools” was modified in 9 of the 11 texts. The most frequent change involved replacing the adjective in the relative superlative of superiority (“the best”) with “the worst” (5 texts). In some cases, in addition to changing the adjective, students altered the noun phrase by introducing “some” to replace “the”. In another case, the adjective “good” was retained, but used in the positive degree (“good tools”).

The data also reveal a concern with quantifiers, with students changing, for example, “many” (an indefinite quantifier) to “some” (2 of the 11 texts) and “all” (a universal quantifier) to “some” (6 of

the 11 texts). These changes indicate an attempt to mitigate the impact of generalisation — a linguistic strategy commonly found in fake news as a means of provoking concern and alarm. One further modification deserves attention: the reference to invented sources (in 3 of the 11 reformulation proposals), whose inclusion may indicate an attempt to endow the text with greater credibility.

The production of the posters (Figure 5) likewise reflects a greater mastery of students' grammatical knowledge, as they not only correctly identified the word classes present in the example incorporated into their creations, but also mobilised knowledge related to some of the linguistic strategies used by fake news authors.

Both in the fake news rewriting task and in the production of the posters, students demonstrated the ability to identify the communicative purpose of the fake news items presented and to transform it through the manipulation of linguistic elements.

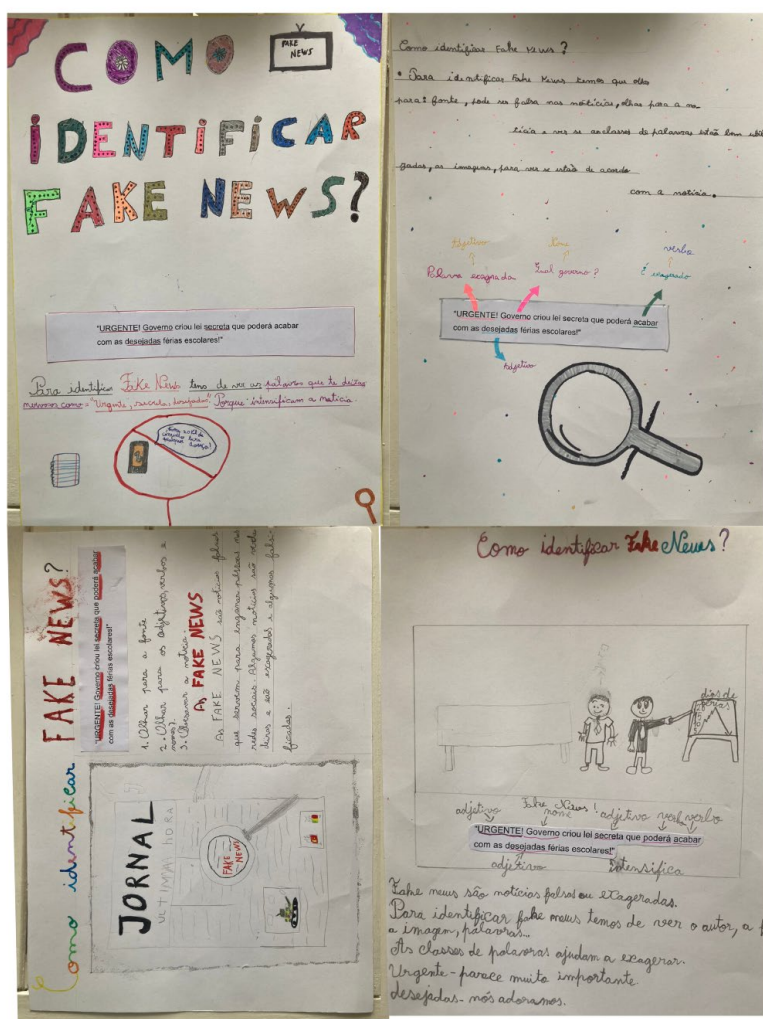


Figure 5. Posters

DISCUSSION

The data obtained reveal that students were able to mobilise textual and paratextual linguistic elements (such as images) in order to identify and distinguish the communicative intentions of each of the news items presented. This evidence aligns with the perspective of authors such as Tamboer et al.,²⁷ who argue that younger learners already display “a noteworthy amount of awareness regarding

fake news”, although their ability to detect such content could still be improved — a view that is corroborated by the results of the study.

The collaborative and holistic nature of the proposed activities may help to account for these findings, as well as the fact that the analysis incorporated multiple dimensions considered fundamental in education for (dis)information, such as the role of images²⁸ and the influence of emotions on the interpretation of message content.²⁹ Accordingly, a message analysis perspective was adopted, as conceptualised by Hobbs,³⁰ for whom effective media literacy requires the integrated deconstruction of textual, visual and emotional elements. This approach made it possible to explore the role of images and the influence of emotions on the interpretation and impact of the news items analysed.

The collaborative approach adopted in this study, centred on the deconstruction of multiple dimensions of the message, aligns with the proposals of Breakstone et al.,³¹ who argue for the need for a new paradigm in the teaching of digital literacy, one that is focused on the practical application of verification strategies, such as the critical analysis of sources and motivations. The effectiveness observed in our activities also confirms that, when students actively and multidimensionally practise message deconstruction, they develop more robust tools for evaluating online information.

With particular regard to the identification and exploration of linguistic strategies present in fake news, the data suggest that students were able to mobilise the knowledge constructed through the analysis, classification and reformulation of texts. Their proposals reveal awareness and understanding of the most common strategies used in fake news, as well as the application of grammatical knowledge — namely word classes — in the construction of informational credibility. Indeed, the changes they applied to the texts, as well as the content of the posters produced, point to a clear awareness of how lexical choices contribute to the distortion of information and the fulfilment of different communicative purposes.

Although some inconsistencies were observed, there is evidence of progress not only in linguistic competences but also in those related to media literacy, which is particularly significant given the difficulties identified among students in this age group with regard to evaluating online information.³²

This positive development corroborates the results of similar structured interventions, such as that conducted by McGrew,³³ which demonstrated that explicit instruction focused on source evaluation strategies can improve young people’s ability to judge the credibility of digital content. The data from the present study suggest precisely that, by combining such strategies with in-depth linguistic analysis, both the detection of disinformation and the understanding of its persuasive mechanisms are enhanced, going beyond mere factual verification.

CONCLUSIONS

The results obtained demonstrate that students were able to mobilise linguistic knowledge in the identification and analysis of fake news. Accordingly, the work carried out — as a proposal for contextualised grammar teaching³⁴ — highlights the didactic potential of integrating fake news into the curriculum for the simultaneous development of students’ media literacy and linguistic competences.

Despite the limitations associated with the size of the participant group and the temporal scope of the study, the data reinforce the importance of developing didactic proposals that explore grammar through its real uses, emphasising the role of linguistic knowledge as a tool for individual empowerment.

ACKNOWLEDGEMENT

The manuscript underwent linguistic revision and stylistic refinement using ChatGPT 5.0.

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TEACHING SOCIAL SCIENCES, ADDRESSING SOCIAL ISSUES: FOSTERING CRITICAL REFLECTION IN EDUCATORS

Author:

ERIKA TIBURCIO-MORENO

Affiliation:

· COMPLUTENSE UNIVERSITY, SPAIN

INTRODUCTION

By what means might the social sciences inspire future educators to assume responsibility for working towards a world grounded in genuine equity and solidarity? This question has informed the entire process of designing and implementing the course described in this paper. It is essential to recognise that education and society should not be understood as separate realities but rather as interconnected domains. For this reason, teaching should not merely reproduce traditional discourse; instead, it must take into account a global context characterised by capitalism, a socioeconomic system that imposes global inequalities, democratic deficits and structural violence.

Within this context, critical global citizenship education in social sciences teaching provides students with opportunities to engage in critical thinking and apply critical frameworks. This form of citizenship education challenges liberal conceptions and encourages collective participation, action and responsibility to address social inequities and transform power relationships at both local and global levels.¹

Social science teaching should engage directly with social issues. This entails incorporating content related to pressing societal concerns, analysing their characteristics, causes and consequences and actively involving students in rethinking categories and identifying potential solutions.² This objective is particularly important given that social science courses in compulsory education often continue to reproduce Eurocentric narratives that exclude intercultural and decolonial perspectives. For example, although the arrival of Christobal Columbus in the Americas is studied throughout Spanish compulsory education, despite historiographical advances, textbooks frequently fail to consider Indigenous perspectives or responses. This omission not only excludes critical social issues but also fails to problematise dominant narratives that perpetuate Eurocentric and colonial approaches within social sciences at school curricula.³

This paper describes the design of the course *Didactics of Social Sciences*, taught in the autumn semester of 2025 as part of the Bachelor of Pedagogy programme. The course is relevant not only for pre-service teachers but also for students intending to work in educational counselling and human resources, as it provides opportunities to rigorously and critically analyse complex social issues. The paper first outlines the theoretical framework underpinning the course. It then describes the structure and methodologies used to examine social problems and assess student learning. Finally, it reflects on

the pedagogical implications of this approach for initial teacher education and identifies directions for future research.

THEORETICAL FOUNDATIONS

Geographical and Historical Thinking

Geographical and historical thinking are two fundamental modes of inquiry in social science learning and teaching. Each offers a distinct, systematic approach to understanding the world and society that transcends traditional approaches based on memorisation.

Geographical thinking emphasises the importance of interdependent relationships between human societies and the environment. These relationships can only be fully understood through the interiorisation of key geographical concepts, such as space and place, proximity and distance and scale and connection.⁴ As a result, students develop the capacity to interpret spatial dynamics and intervene in space in ways that address ecological and social challenges.⁵

Historical thinking introduces a temporal dimension, linking the present to the past through the interpretive practices of historians. This mode of reasoning involves engagement with key concepts that shape historical understanding: (a) historical significance, (b) evidence (sources), (c) causes and consequences, (d) change and continuity, (e) historical perspectives and (f) ethical considerations.⁶ In contrast to the linear narratives that often dominate school curricula, this approach is characterised by debate and grounded in disciplinary methods of inquiry.

The integration of these two methods of inquiry enables students to critically reflect on the interconnections between time, space, environment and human activity. In practical terms, this involves questioning the apparent naturalness of spatial and temporal arrangements and recognising that territorial boundaries and historical periods are social constructions that reflect power dynamics rather than objective realities.

This dual perspective is particularly valuable for future educators, who must be equipped to guide their students beyond the superficial memorisation of dates and maps towards deeper analytical engagement with the world. By combining geographical awareness of how spaces are produced and contested with historical understanding of how narratives are constructed and marginalised, educators develop a comprehensive analytical framework that supports the design of curricula that are both intellectually rigorous and socially committed to a more just and equitable world.

Social Problems and Social Sciences Teaching

The fundamental premise of this course is that social problems should serve as both the primary theoretical framework and the foundation for the teaching and construction of social science knowledge. This approach connects classroom learning with real-life contexts, requiring students to seek out, interpret and compare sources. It also positions dialogue and debate as essential components of both learning and active citizenship.⁷

The course further examines how traditional approaches to social science teaching have functioned as political tools that silence subaltern voices⁸ and naturalise cultural, ethnic, class and gender hierarchies, often privileging whiteness over other identities.⁹

The analysis of inequality and structural oppression is therefore central to the course, with Eurocentrism serving as a key theoretical concept. Broadly defined, Eurocentrism positions the European model of development as the hegemonic paradigm, assuming that other societies must emulate its sociopolitical, economic and cultural forms to achieve progress and modernity. In this course, students critically interrogate foundational concepts such as progress, universalism and Orientalism as ideological constructs. This challenges the assumption that Eurocentric modernity represents a superior or more advanced mode of existence.¹⁰

Consequently, students are not only required to apply geographical and historical thinking to the analysis of social problems but are also encouraged to critically reassess their prior knowledge. In doing so, they are supported in moving beyond the Eurocentric perspectives that they may have internalised and in developing more reflexive and inclusive ways of understanding the world.

Addressing social problems in the classroom serves a dual purpose. On the one hand, it ensures that the curriculum remains connected to the lived realities of students and their communities, fostering a sense of relevance that is often absent from traditional educational approaches. On the other hand, it compels students to develop and exercise higher-order thinking skills, including the capacity to evaluate historical and geographical sources, identify ideological assumptions within hegemonic narratives and propose counterhegemonic interpretations grounded in a commitment to social justice. This approach recognises that the construction of the educational curriculum inevitably reflects ideological positions, whether or not these are made explicit.

Critical Global Citizenship Education

Our conception of social sciences learning and teaching is inextricably linked to critical global citizenship education and is grounded in a nuanced understanding of global issues that arise from unequal power relations, injustice and the division of labour and wealth. Within this framework, students are encouraged to reflect on ‘the historical/cultural production of knowledge and power in order ... to make better informed choices – but the choices of action and meaning (what “we are” or “should be”) are never imposed, as the “right to signify” is recognised and respected (as an ethical relationship “commands”)’.¹¹

Critical global citizenship education conceptualises citizenship as an ongoing process that transcends the boundaries of the nation-state, fostering a model of solidarity in which all communities are entitled to equal rights. These values are grounded in the pursuit of transformative change, solidarity and social justice as well as in the recognition of pluriversality – that is, the coexistence of diverse forms of wisdom and knowledge beyond Western epistemology – and the multiple exclusions experienced by nonconforming identities.¹²

As this course is designed for future educators, critical citizenship is explored from both theoretical and practical perspectives through the use of dialogical and horizontal methodologies, including problem-based learning, seminars and workshops. These approaches enable students to engage with critical citizenship from a global perspective and to adopt more democratic orientations in their future professional practice, particularly through the shift towards student-centred learning.

Moreover, the emphasis on dialogical methodologies represents not merely a pedagogical choice but also a political and ethical stance. Through collaborative problem-solving, the course models the participatory and democratic educational practices it advocates. This experiential dimension is essential, as it allows future educators to internalise the principles of critical global citizenship not as abstract concepts but as embodied practices that can inform their everyday professional work.

Critical Pedagogical Approaches: Intersectionality, Decoloniality and Interculturality

The theoretical framework of this course is grounded in critical pedagogical approaches that offer tools for rethinking education. First, critical interculturality is introduced following the model proposed by Catherine Walsh,¹³ who conceptualises it as a political, epistemic and ethical project aimed at decolonising power relationships between cultures. The objective is not merely to incorporate minority identities into dominant frameworks but to recognise and restore the knowledge, languages and cosmovisions of marginalised peoples. While intercultural education primarily addresses contemporary relationships, decoloniality extends this perspective within social sciences learning and teaching.

Decoloniality involves recognising that the modern world system is rooted in a colonial capitalist order established in the sixteenth century, in which societies, peoples and individuals were hierarchised according to economic, political, social and epistemic positions. Within this system, European norms – such as notions of civilisation, rationalism, wealth, whiteness and maleness – were naturalised as superior, resulting in the marginalisation and systemic oppression of those who did not conform to these standards.¹⁴ Consequently, alternative forms of knowledge and identity were silenced or devalued through the colonial gaze.

Accordingly, social science teaching must critically address how knowledge production and curricular practices often reproduce these colonial hierarchies and silence subaltern groups. Alongside interculturality and decoloniality, intersectionality provides an additional analytical dimension essential for understanding social inequality. Although the term ‘intersectionality’ was coined by Kimberlé Crenshaw,¹⁵ Patricia Hill Collins’ theory of the matrix of domination is particularly relevant for historical and geographical analysis. It emphasises that Eurocentric universality must be reconfigured into more democratic and pluriversal forms of knowledge. As Collins argues, ‘all contexts of domination incorporate some combination of intersecting oppressions, and considerable variability exists from one matrix of domination to the next as to how oppression and activism will be organised’.¹⁶ This perspective highlights that categories such as gender, class and religion are socially constructed and context-dependent, requiring in-depth understanding of specific societies in order to fully grasp the dynamics of inequality.

Taken together, intersectionality, interculturality and decoloniality provide students with the conceptual tools necessary to work towards a more equitable world in which diverse ways of being and knowledge can coexist. Furthermore, the course fosters a critical awareness of how capitalism has contributed to the development of unequal systems in which large segments of the global population experience poverty, violence and insecurity.

STRUCTURE AND ASSESSMENT

The course is structured in three parts, comprising a total of six units. As outlined in Table 1, each thematic unit is associated with specific assignments that are discussed in class. All assignments are completed collaboratively to promote deeper understanding, critical engagement and sustained dialogue.

Theme	Assignment
1. Introduction to Social Sciences teaching: geographical thinking and historical thinking	1.1. Addressing problems from a Social Science perspective: steps for identifying and rethinking
2. Sources as an analysis of reality: representations from primary and secondary sources. Art as representation: discourses of power and counter-discourses of representation	2.1. Heritage and identity: questioning hegemonic discourses on heritage
3. Social science teaching and education for global citizenship	3.1. Ecosocial and global analysis: understanding interdependence
4. Social issues and a critical perspective in Social Science Teaching: intersectionality education, decoloniality, and interculturality	4.1. Curriculum analysis
5. Instances of social issues: social inequality, violence and colonialism, and misinformation and hate speech	5.1. Reflection essay: conflicting Western morality in child soldiers 5.2. Visit to exhibition and essay, La conspiración judeo-masónica. La construcción de un mito at the Sefardi Cultural Center (Madrid). 5.3. Understanding historical and social hate speech: comparing discourses and a teaching proposal
6. Methodologies in social sciences education: resources and teaching sequences	6.1. Final Project: social sciences education for a Real Democratic World

Table 1. Course Themes and Assignments

This organisation of course content is grounded in a critical, student-centred methodology. All assignments are developed collaboratively in groups, and dialogue and collective inquiry are positioned as essential learning processes. Reflective learning, alongside the application of theoretical concepts and frameworks to real-world social problems, is prioritised throughout students' work. The aim of this approach is to ensure that the analysis of sources, the identification of power relations and the formulation of educational responses contribute to the development of critical global citizens equipped to address contemporary global challenges. The final project integrates all course components, enabling students to design a teaching proposal focused on a social issue from a critical social sciences perspective.

The methodological design draws on problem-based learning as a central pedagogical strategy. Rather than presenting social science content as a fixed body of knowledge to be memorised, each unit introduces a problem or guiding question that students must investigate collaboratively, with the aim of constructing shared knowledge through horizontal exchange. Students are thus positioned as active producers of knowledge, engaging with primary and secondary sources, visual and textual representations and contemporary case studies to develop their analytical capacities.

Assessment in this course is continuous and formative. Each assignment is aligned with one or more of the theoretical pillars outlined above, ensuring that students progressively integrate geographical and historical thinking, critical citizenship and intersectional and decolonial analysis into their work. For instance, Assignment 2.1, which focuses on heritage and identity, requires students to analyse a heritage site or cultural artefact, considering which narratives are represented and which are silenced.

Assignment 5.2 involves a visit to an exhibition on the Judeo-Masonic conspiracy at the Sefardi Cultural Centre in Madrid, providing students with a concrete encounter with mechanisms of hate speech and misinformation. This experience encourages them to connect historical antisemitism with contemporary forms of discrimination.

The final project (Assignment 6.1) serves as a capstone experience in which students select a social issue, analyse it using the theoretical frameworks studied throughout the course and develop a pedagogical sequence for a formal or non-formal educational context. This assignment encourages students to synthesise their learning and to envision themselves as agents of educational transformation capable of designing curricula that prioritise social justice, pluriversality and critical enquiry. By requiring the production of actionable teaching materials, the course bridges the gap between theoretical knowledge and professional practice, ensuring that critical perspectives extend beyond the university classroom into students' future educational work.

CONCLUSION

In the contemporary era, education must remain attentive to global challenges that underscore the persistence of structural inequality and social injustice beyond national borders, thereby demanding collective responsibility. From the perspective of social science education, persistent Eurocentrism contributes to the normalisation of inequality and the marginalisation of subordinate groups. This proposal aligns with the imperative to place social problems at the centre of social science education and to address them through a critical lens that exposes underlying capitalist power relations. Consequently, decoloniality, intersectionality and interculturality must be integral to the development of a meaningful education for critical global citizenship.

As pre-service educators, we recognise our responsibility to the world in which we live. Accordingly, this paper advances a model of teaching grounded in transformative education and sustained critical engagement. It demonstrates how a social science curriculum for pre-service educators can move beyond the reproduction of traditional Eurocentric narratives. By grounding the curriculum in geographical and historical thinking and organising it around the analysis of social problems, students are invited to engage with the world as critical thinkers – prepared to question, analyse and act – rather than as passive recipients of established knowledge. The integration of intersectionality, decoloniality and interculturality further ensures that students develop the conceptual tools necessary to understand the multiple and intersecting systems of oppression that shape contemporary societies.

Future research should explore the impact of this course design on students' development of critical consciousness, as well as its influence on their subsequent professional practice. Longitudinal studies tracking graduates as they enter educational settings would provide valuable insight into the extent to which critical perspectives developed during initial training translate into transformative pedagogical approaches. Additionally, further research is needed to assess the transferability of this model to other disciplinary contexts within teacher education and to different national settings, given that challenges such as Eurocentrism, structural inequality and democratic deficit are not unique to the Spanish context.

NOTES

- ¹ Alejandra Boni, Sergio Belda-Miquel, and Carola Calabuig, *Educación para la ciudadanía global crítica* [Critical Global Citizenship Education] (Madrid: Síntesis, 2020), 35–37.
- ² Mariona Massip Sabater and Jordi Castellví, “Poder y diversidad. Los aportes de la interseccionalidad a la didáctica de las Ciencias Sociales” [Power and Diversity. Contributions of Intersectionality to Social Studies Education], *Clio. History and History Teaching* 45 (2019): 139–54, https://doi.org/10.26754/ojs_clio/clio.2019458646.
- ³ Benjamin A. Jerue, “The Discovery of America? Representations of Columbus and Indigenous Peoples in Spanish Textbooks,” *Clio. History and History Teaching* 44 (2018): 135–45, https://doi.org/10.26754/ojs_clio/clio.2018448674.
- ⁴ Peter Jackson, “Thinking Geographically,” *Geography* 91, no. 3 (2006): 199–204, <https://doi.org/10.1080/00167487.2006.12094167>.
- ⁵ Carlos Guallart, “Competencia espacial, pensamiento geográfico y ciudadanía crítica: un enfoque integrado en educación secundaria” [Spatial Competence, Geographical Thinking and Critical Citizenship: An Integrated approach in Secondary Education], *Espacio, Tiempo y Forma. Serie VI, Geografía* 18 (2025): 151–80, <https://doi.org/10.5944/etfvi.18.2025.45337>.
- ⁶ Peter Seixas and Tom Morton, *The Big Six Historical Thinking Concepts* (Toronto: Nelson College Indigenous, 2013), 4.
- ⁷ Antoni Santisteban, “La enseñanza de las ciencias sociales a partir de problemas sociales o temas controvertidos: estado de la cuestión y resultados de una investigación” [Social Sciences Education Based on Social Issues or Controversial Issues: State of the Art and a Research Results], *El Futuro Del Pasado* 10 (2019): 73, <https://doi.org/10.14516/fdp.2019.010.001.002>.
- ⁸ Michel-Rolph Trouillot, *Silenciando el pasado. El poder y la producción de la Historia* [Silencing the Past: Power and the Production of History], trans. Miguel Ángel del Arco (Granada: Comares, 2017), 97–98.
- ⁹ Ramón Grosfoguel, *De la sociología de la descolonización al nuevo antiimperialismo decolonial* [From the Sociology of Decolonisation to the New Decolonial Anti-Imperialism] (Ciudad de México: Akal, 2022), 201–2.
- ¹⁰ Immanuel Wallerstein, “Eurocentrism and its avatars: The Dilemmas of Social Science,” *New Left Review* 226 (1997): 106, <https://newleftreview.org/issues/i226/articles/immanuel-wallerstein-eurocentrism-and-its-avatars-the-dilemmas-of-social-science>.
- ¹¹ Vanessa Andreotti, “Soft Versus Critical Global Citizenship Education,” *Policy and Practice: A Development Education Review* 3 (2006): 49, <https://www.developmenteducationreview.com/sites/default/files/Issue3.pdf>
- ¹² Boni, Belda-Miquel, and Calabuig, *Educación para la ciudadanía global crítica*, 47.
- ¹³ Catherine Walsh, “Interculturalidad y colonialidad del poder. Un pensamiento y posicionamiento “otro” desde la diferencia colonial” [Interculturality and the Coloniality of Power. A Way of Thinking and a Political Positioning from the Colonial Difference], in *El giro decolonial: reflexiones para una diversidad epistémica más allá del capitalismo global* [The Decolonial Turn: Reflections for an Epistemic Diversity Beyond Global Capitalism], ed. Santiago Castro-Gómez and Ramón Grosfoguel (Bogotá: Siglo del Hombre Editores; Universidad Javeriana, Instituto Pensar, 2007), 47–62.
- ¹⁴ Walter D. Mignolo, *La idea de América Latina. La herida colonial y la opción decolonial* [The Idea of Latin America], trans. Silvia Jawerbaum and Julieta Barba (Barcelona: Gedisa, 2007), 60–1.
- ¹⁵ Kimberlé Crenshaw, “Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics,” *University of Chicago Legal Forum* 1989, no. 1 (1989): 139–67, <https://chicagounbound.uchicago.edu/uclf/vol1989/iss1/8>
- ¹⁶ Patricia Hill Collins, *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment*, 2nd ed. (New York: Routledge, 2000), 228.

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BEYOND CODE: HUMAN-CENTERED AI AND THE DISSOLUTION OF THE STEM–HUMANITIES DIVIDE

Author:

JAMES HUTSON

Affiliation:

LINDENWOOD UNIVERSITY, UNITED STATES

INTRODUCTION

Across many institutions, there is renewed pressure on the arts and humanities to demonstrate relevance beyond the classroom. The Pedagogy 2025 framing of contemporary academia emphasizes an “outward turn” toward student-focused pedagogy, problem-based learning, and partnerships with external stakeholders, including industry and civic organizations. Within this context, artificial intelligence is no longer treated simply as a technical domain, but as a socio-technical force that must be integrated into curricula with attention to ethics and public impact. Human-centered artificial intelligence (HCAI) provides a conceptual anchor for this work. Shneiderman’s HCAI framework argues for designs that combine high levels of human control with high levels of automation so that AI systems remain reliable, safe, and trustworthy in practice.¹ The emphasis is not on full autonomy, but on amplifying human self-efficacy, mastery, and responsibility.

Recent scholarship on AI education extends this thinking into curricular design. Khan and colleagues use a collaborative autoethnography to argue for “whole-person education” for AI engineers, combining technical skills with ethical awareness, social responsibility, and interdisciplinary collaboration.² Their findings resist technosaviourist narratives and call for curricula that bridge technical and philosophical literacies. In parallel, Diwan and coauthors show that AI-based content generation and adaptive learning pathways can enhance engagement when the systems are framed as augmentations to narrative and problem-based learning rather than as replacements for instructional design.³

The preservation-brief model presented here applies these insights in a humanities setting. It treats HCAI not only as a theoretical lens, but as a concrete design principle. Students use intelligent tools, but within a workflow that requires explicit modeling decisions, provenance logging, and structured reflection. The assignment is deliberately situated in a real-world context: the condition and future of historic structures in Saint Charles and the greater region. In doing so, it addresses the conference mandate to connect teaching, research, and community engagement in one integrated pedagogical design.

Human-Centered AI and Whole-Person Pedagogy

HCAI’s insistence on coupling human control with automation aligns naturally with whole-person education models. Shneiderman’s two-dimensional HCAI framework separates levels of automation from levels of human control and argues that the design goal in most educational contexts should be

“high–high” rather than automation alone.⁴ This orientation resonates with Khan and colleagues’ argument that AI curricula should cultivate not only technical competencies but also ethical, intercultural, and reflective capacities.⁵ Whole-person education, in their account, is explicitly interdisciplinary and attentive to psychological and social dimensions of learning.

In practice, this means designing assignments where students cannot simply “outsource” thought to generative systems. The preservation brief requires students to interpret outputs, critique them, and situate them within human histories and community priorities. AI-assisted tools support content generation, narrative structuring, or image production, but they operate inside a transparent workflow that foregrounds human judgment. This combination is consistent with empirical evidence from AI-enhanced classrooms. For example, Diwan and coauthors show that AI-generated narrative fragments used to construct interactive learning paths can increase learner engagement when integrated into coherent instructional design, rather than deployed as isolated novelty.⁶ In a different domain, Bian and colleagues demonstrate that AI-generated images can raise engagement and self-efficacy in visual art education without increasing cognitive load, provided that teachers scaffold their use with clear comparisons to classical imagery and explicit reflective prompts.⁷ The humanities are particularly well placed to adopt such human-centered, whole-person strategies. Many art history and cultural heritage courses already emphasize interpretive multiplicity, ethical complexity, and situated knowledge. Embedding HCAI within these courses allows educators to model what it means to use intelligent systems critically and contextually rather than uncritically.

The toolset underlying the preservation-brief assignment is deliberately eclectic. It includes no-code workflow builders to clean and join datasets, ArcGIS StoryMaps for narrative mapping, optical character recognition (OCR) for archival material, and optional photogrammetry pipelines for façade documentation. Each of these tools can be used by non-coders once they have basic conceptual scaffolding, which aligns with arguments in the digital humanities about lowering technical barriers. Al-Sahlani’s guide for “beginners and non-coders” in digital humanities emphasizes that spreadsheet software, web-based visualization platforms, and tools like TimelineJS or Voyant-Tools can allow scholars to explore digital methods without first mastering scripting languages.⁸

StoryMaps occupy a special role. Saladin’s ArcUser case studies show that Esri StoryMaps assignments can help humanities students develop spatial perspectives by combining maps, timelines, and primary sources in a single interface.⁹ In their courses, students in history and area studies used StoryMaps to visualize trade routes, urban transformations, and cultural geographies. Many reported that visualizing movement and spatial relationships led them to question textbook narratives and identify gaps in secondary literature. The preservation-brief assignment extends this logic to civic heritage: students use StoryMaps to juxtapose contemporary site conditions, historical layering, and modeled risk indices in a manner legible to non-specialist community partners.

Open data is the fuel that makes this integration possible. The World Bank’s Open Data Toolkit identifies transparency, public service improvement, and innovation as core benefits of releasing machine-readable government data.¹⁰ Gurin similarly argues that open government data can serve as a “lever” for transparency, citizen engagement, and economic growth when it is reused by civic technologists and local communities.¹¹ Within the assignment, students draw on open parcel datasets, building inspections, vacancy inventories, and historic-district boundaries, thereby gaining firsthand experience with both the power and the limitations of open data regimes.

Pedagogical Approaches: Flipped, Engaged, and AI-Enhanced

The structure of the course in which this assignment sits draws on research into flipped and engaged learning. Systematic reviews of the flipped classroom in higher education have found that moving direct instruction outside the classroom and devoting in-person time to problem solving and

collaboration can improve engagement and, in many cases, learning outcomes.¹² Bintz and colleagues also note that effective flipped designs depend on meaningful in-class activities rather than simply pre-recorded lectures; students need structured tasks that require peer interaction and higher-order thinking.¹³

The preservation-brief project adopts this logic. Short video or text lectures introduce key concepts such as HCAI, open data, geocoding, and condition indices. Class time is reserved for hands-on work with datasets, StoryMaps, and field documentation, along with structured critique sessions where teams review each other's evolving artifacts. This pattern creates conditions where intelligent tools can be used in situ: students can experiment with AI-based summarization or code generation under instructor supervision, discuss concerns about bias or opacity, and iterate without the isolation that can accompany purely asynchronous tool use.

AI-enhanced arts and humanities education are still emerging research areas, but several studies illustrate the potential of generative systems. Bian and coauthors' controlled experiment in visual art education indicates that AI-generated images can significantly increase classroom engagement and perceived self-efficacy while leaving cognitive load unchanged, suggesting that carefully designed GAI interventions can be additive rather than overwhelming.¹⁴ Exploratory work on generative AI in art education similarly suggests potential for constructivist learning, particularly when students are required to document prompts, reflect on iterations, and compare AI outputs to historical precedents. The historic preservation assignment internalizes these findings by requiring explicit documentation of prompts, rationales, and choices wherever AI tools are used. Rather than treating GAI as a magic box, it becomes another medium within a documented research and design process.

AN INTERDISCIPLINARY WORKFLOW FOR HISTORIC PRESERVATION

At the core of the article is a ten-step workflow that operationalizes HCAI in an art history context. The sequence is intentionally designed to traverse the entire research and design lifecycle, from scoping questions to public dissemination— as illustrated in Table 1.

Step	Focus	Key Actions	Key Tools / Concepts
1	Scoping the question	Define community-anchored research question; select historic building/block; identify stakeholders; specify decision the brief should inform	Whole-person education; stakeholder mapping; context and motivation
2	Open-data acquisition	Search municipal/regional open-data portals; download parcel, inspection, violation, and vacancy datasets; record URLs, access dates, schema details	Open data portals; data inventory; provenance trail; relevance and usability
3	Archival digitization	Locate scanned inspection cards, permits, maps; run OCR; save raw scans and cleaned text versions	OCR (e.g., Tesseract); archival sources; machine-readable text; limits of automation
4	Cleaning & geocoding	Standardize column headers; reconcile inconsistent addresses; geocode remaining non-spatial records; log all edits	Data cleaning; reconciliation; geocoding; data-cleaning record
5	Integration & condition index	Join parcel, inspection, and vacancy data; compute weighted condition index; normalize scores to 0–100; archive formulas	Weighted scoring; normalization; simple modeling; formulas appendix
6	Field documentation	Photograph façades from multiple angles; complete condition checklist (materials, cracks, moisture, openings); optionally generate 3D meshes	Site photography; condition checklist; photogrammetry; low-cost 3D heritage capture
7	Provenance & risk logging	Maintain provenance log (who, what, when, why); construct risk register (issue, likelihood, mitigation); align with AI risk framework	PROV data model; entities–activities–agents; risk register; NIST AI RMF
8	StoryMap narrative	Build ArcGIS StoryMap; combine maps, text, images, charts; structure: history → analysis → findings → recommendations; embed provenance/risk links	ArcGIS StoryMaps; narrative mapping; transparency links; humanities engagement
9	Preservation brief	Draft 4–6 page report; include executive summary, condition and risk overview, prioritized interventions with cost bands, supporting data and references; use plain professional language	Preservation brief; executive summary; cost bands; accessible technical writing
10	Partner critique & revision	Submit StoryMap, brief, provenance appendix; obtain municipal/nonprofit feedback; log comments; revise artifacts; document changes	Partner review; revision log; dialog and change record; civic collaboration

Table 1. Structured Workflow for the Historic Preservation Brief (HCAI Model)

Assessment, Ethics, and Transparency

Assessment for the assignment is deliberately multi-dimensional. A rubric weights provenance, interpretability, spatial narrative quality, analytical accuracy, and partner fit. The design maps onto established frameworks such as the AAC&U VALUE rubrics for integrative learning and information literacy, as well as NACE career competencies related to communication, critical thinking, and equity.¹⁵

Provenance and risk management are not afterthoughts but central criteria. The use of W3C PROV-DM as a conceptual guide emphasizes that provenance helps stakeholders assess the quality and trustworthiness of data, not simply track it.¹⁶ Similarly, drawing on the NIST AI RMF reinforces that AI and analytics are socio-technical systems whose impacts emerge from how models, data, and institutional practices interact.¹⁷ Bringing these frameworks into an art history assignment makes explicit that humanities projects can and should meet high standards of traceability and risk awareness.

Open data ethics are addressed through the risk register and through case studies from organizations such as the World Bank and Open Government Partnership. Reports on open data initiatives show that

transparency and citizen engagement benefits are often counterbalanced by concerns about data quality, privacy, and unequal capacity to reuse data.¹⁸ Having students confront missing values, inconsistent categorization, or ambiguous licensing in local datasets helps demystify these macro-level debates.

Bridging the STEM–Humanities Divide

The preservation-brief assignment aims not simply to add a veneer of “data” to a humanities course, but to stage a genuine encounter between methodological cultures. At the level of practice, it foregrounds a shared cycle of inquiry: question, observe, analyze, interpret. Modeling a condition index requires students to confront the arbitrariness of some quantitative decisions and to recognize that numbers embody value judgments, weights, and thresholds. Crafting a StoryMap and brief forces them to translate those numbers into meaningful narratives for specific publics.

This movement between modeling and storytelling builds what might be called mutual literacy. Humanities students gain experience in working with tabular and geospatial data, including normalization, joining, and basic weighting. STEM-oriented students or partners encounter thick description, archival nuance, and stakeholder narratives. The workflow makes visible how each mode of reasoning can check and enrich the other.

The benefits are not merely cognitive. By connecting course work to municipal heritage and neighborhood concerns, the assignment also illustrates how open data and AI can support civic storytelling and participatory governance. Research on open data suggests that the most meaningful impacts emerge when communities and intermediaries use data to frame problems and propose changes, not simply when governments publish datasets.¹⁹ The student teams effectively act as such intermediaries, translating diffuse records into legible, situated arguments.

From an employability perspective, the combination of StoryMaps, briefs, provenance logs, and risk registers yields a portfolio that is legible across sectors. Graduates can demonstrate that they understand both how to manipulate data and how to communicate findings to non-specialist stakeholders. This is consistent with industry-facing research that emphasizes augmentation rather than automation as the most sustainable role for AI in knowledge work.²⁰

CONCLUSION

Human-centered AI in the humanities is not primarily about teaching students to build models or prompt systems. It is about designing workflows in which intelligent tools are embedded inside transparent, ethically aware, community-connected processes. The historic preservation brief described here offers one such model. It integrates open data, no-code analytics, digital storytelling, and structured reflection in a way that dissolves the conventional boundary between STEM and the humanities.

By anchoring work in real sites and stakeholders, it meets the call for an “outward turn” in academia. By insisting on provenance logging, risk registers, and alignment with frameworks such as PROV-DM and the NIST AI RMF, it demonstrates that humanities projects can support rigorous forms of transparency and accountability. Empirical research on flipped learning, whole-person education, and AI-enhanced art instruction lends support to the claim that such designs can increase engagement and support deeper learning when carefully scaffolded.²¹

The broader implication is that AI-augmented pedagogy should not be siloed by discipline. Instead, assignments like the preservation brief show how a shared methodological core of inquiry and evidence can be instantiated through different media and tools. When students learn to move fluently between modeling and meaning, between data and discourse, they are better prepared to navigate a world in which AI is omnipresent but not destiny. In that sense, HCAI in the humanities is less about

adding technology and more about recovering and extending the humanistic commitments of context, responsibility, and public engagement in a data-rich age.

NOTES

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- ² Rubaina Khan et al., "Whole-Person Education for AI Engineers," in *Proceedings of the Canadian Engineering Education Association (CEEA)*, 2025, arXiv:2506.09185.
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- ⁴ Shneiderman, "Human-Centered Artificial Intelligence: Reliable, Safe, and Trustworthy," 495–504.
- ⁵ Khan et al., "Whole-Person Education for AI Engineers," arXiv:2506.09185.
- ⁶ Diwan, Srinivasa, and Suri, "AI-Based Learning Content Generation and Learning Pathway Augmentation to Increase Learner Engagement," 100110.
- ⁷ Cunling Bian et al., "Effects of AI-Generated Images in Visual Art Education on Students' Classroom Engagement, Self-Efficacy and Cognitive Load," *Humanities and Social Sciences Communications* 12, no. 1 (2025): 1548, <https://doi.org/10.1057/s41599-025-05860-2>.
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- ¹² Maria Ijaz Baig and Elaheh Yadegaridehkordi, "Flipped Classroom in Higher Education: A Systematic Literature Review and Research Challenges," *International Journal of Educational Technology in Higher Education* 20, no. 1 (2023): 61, <https://doi.org/10.1186/s41239-023-00430-5>.
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- ¹⁵ AAC&U (Association of American Colleges and Universities), "VALUE Rubrics," accessed October 19, 2025, <https://www.aacu.org/value/rubrics>; NACE (National Association of Colleges and Employers), "Career Readiness: Competencies for a Career-Ready Workforce," revised April 2024, <https://www.nacweb.org/>.
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²⁰ Ben Shneiderman, "Human-Centered Artificial Intelligence: Reliable, Safe, and Trustworthy," *International Journal of Human-Computer Interaction* 36, no. 6 (2020): 495–504, <https://doi.org/10.1080/10447318.2020.1741118>; Diwan, Srinivasa, and Suri, "AI-Based Learning Content Generation and Learning Pathway Augmentation to Increase Learner Engagement," 100110.

²¹ Maria Ijaz Baig and Elaheh Yadegaridehkordi, "Flipped Classroom in Higher Education: A Systematic Literature Review and Research Challenges," *International Journal of Educational Technology in Higher Education* 20, no. 1 (2023): 61, <https://doi.org/10.1186/s41239-023-00430-5>; Khan et al., "Whole-Person Education for AI Engineers," arXiv:2506.09185; Cunling Bian et al., "Effects of AI-Generated Images in Visual Art Education on Students' Classroom Engagement, Self-Efficacy and Cognitive Load," *Humanities and Social Sciences Communications* 12, no. 1 (2025): 1548, <https://doi.org/10.1057/s41599-025-05860-2>.

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APPLIED LEARNING IN STEM PROFESSIONAL DEVELOPMENT FOR EDUCATORS AND STEM ENGAGEMENT FOR STUDENTS

Author:

LESLIE HULING

Affiliation:

TEXAS STATE UNIVERSITY, UNITED STATES

INTRODUCTION

A strong STEM workforce is essential for maintaining U.S. competitiveness in science, technology, and innovation. Recent national data indicate that STEM occupations make up a substantial and growing portion of the U.S. labor force. The National Science Board reports that in 2021, STEM workers, both traditional STEM professionals and the skilled technical workforce, account for approximately 24 percent of the entire U.S. workforce.¹ The need for increasing numbers of professionals in the STEM field is particularly acute as is highlighted in the U.S. Bureau of Labor Statistics 2019–29 employment projections that indicate occupations in the STEM field are expected to grow 8.0 percent by 2029, compared with 3.7 percent for all occupations.²

Addressing the STEM workforce challenge requires not only strengthening higher-education pathways but also investing in STEM experiences for elementary, middle school and high school students. At Texas State University, the LBJ Institute for STEM Education and Research focuses on the K-12 student and educator population to provide engaging and inspiring STEM experiences to stimulate students' interest in STEM and inspire their future STEM educational and career pursuits. Over its 40-year history at the university, the LBJ Institute funds its work through various educational grants from state, federal and foundation funding entities. This article shares a specific two-year initiative, Storymaker STEM Camp: Imagine, Play, Code, focused on computational thinking and an introduction to coding basics for young children that was funded by the STEM-For-All Partnership, one of the LBJ Institute's federal grants. Background on the STEM-for-All Partnership will be briefly shared, along with a description of the Storymaker Camp, and the theoretical underpinnings of this combined professional development and STEM engagement project.

STEM-FOR-ALL PARTNERSHIP

The STEM-For-All Partnership consists of the university, the area's largest school district, and the city's Chamber of Commerce. The STEM-For-All Partnership is grounded in the belief that all community members, regardless of their career paths or aspirations, interact daily with science, technology, engineering, and mathematics (STEM) and in order to function comfortably and effectively in today's society, all citizens, regardless of their age, can benefit from captivating and enriching STEM engagement experiences in formal and informal settings. This public/private initiative combines a workforce research initiative with a well-integrated portfolio of STEM

engagement and educator professional development opportunities for learners of all ages from this congressional district.

The STEM-For-All project sponsors a wide variety of educator professional development opportunities and provides STEM engagement activities at area schools and STEM nights throughout the school year. The Storymaker Camp: Imagine, Play, Code is an example of both a professional development and a STEM engagement activity. The STEM-For-All project also operates an internship program for secondary students and a summer externship program for area teachers. Schools and community organizations can request speakers and/or university promotional materials for specific events and the STEM-for-All Partnership will tap the expertise of faculty and coordinate arrangements for them to support the request. The research component of the STEM-For-All Partnership is primarily operationalized during the summer and yields products that share the research findings. In the summer of 2025, the research component developed a series of three research reports on the STEM workforce each targeted to a specific stakeholder group (parents/students, employers, and higher education administrators).

STORYMAKER STEM CAMP IN A NUTSHELL

The LBJ Institute utilized a novel two-year approach to enable teachers to master and apply their skills in developing computational thinking in early grade students. In year one of the project, teachers attended a one-week summer institute during summer 2024 taught by university faculty members from the College of Education and School of Art and Design. During this week-long institute participating teachers engaged in hands-on learning using technological tools and various manipulatives to help students develop computational thinking skills. Teachers were encouraged to integrate these teaching approaches into their own classrooms and to periodically meet with their institute instructors to debrief their classroom experiences and to problem-solve with their peers about the challenges they encountered. A total of four online sessions were held throughout the 2024-25 academic year. In summer 2025, a subset of these teachers was selected to participate in a two-day refresher course with the same Institute instructors. Teachers were partnered with a co-teacher and a critical component of the two days was for the teacher teams to design a three-day camp for pre-school campers. The remainder of the week comprised a three-day camp for PK-2nd grade students taught by the participating teachers during which they were observed and sometimes assisted by the institute instructors as they conducted activities with young children. At the end of each day teachers participated in a daily debrief session where they received feedback and mentoring from their instructors. Figure 1 depicts the design of this project.

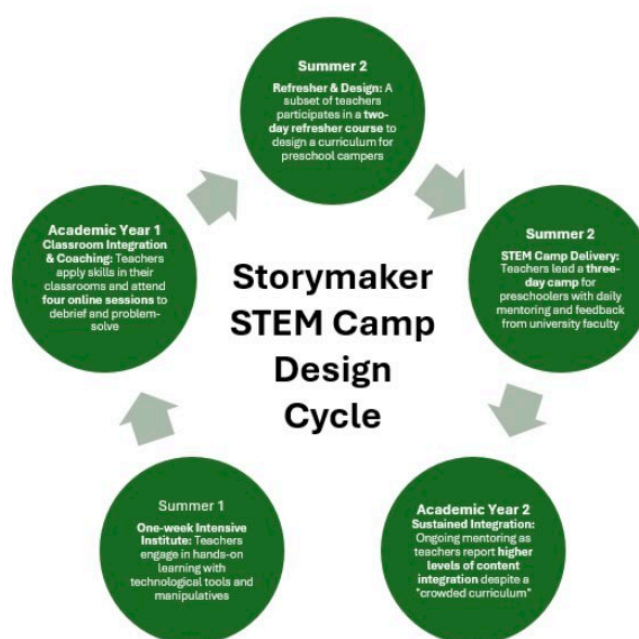


Figure 1. Storymaker STEM Camp Design Cycle

A brief video that was produced about the experience and shows children engaging in the activities designed to promote their conceptual and computational thinking and can be accessed at <https://lbj-stem.education.txst.edu/stem-for-all-partnership/teacher-professional-development-and-student-stem-engagement.html>.³

THEORETICAL UNDERPINNINGS OF STORYMAKER STEM CAMP

The overall approach utilized in this project is grounded in interlocking theoretical underpinnings that guided the selection of the curriculum content, the design of the experience, and instructional methods used with the participating teachers and the preschool student campers.

Understanding the STEM Identity Development Process

Research indicates that students' early, pre-college STEM experiences are critical in inspiring them to subsequently pursue future academic programs in STEM and ultimately to enter STEM career fields.⁴ These early experiences collectively promote the process through which students form their personal STEM identities that will be a determining factor in what STEM opportunities they pursue and their belief that they can be successful in STEM pursuits. STEM identity has been defined as how people envision themselves in relationship to STEM experiences and the meaning of these experiences.⁵ People who have developed STEM identities think about themselves as science learners and perceive themselves as someone who knows about, uses, and sometimes contributes to science".⁶ STEM identity has been shown to have a powerful role in an individual's success in educational environments, as well as on their career goals and trajectories.⁷

Research consistently shows that when students participate in hands-on inquiry, robotics, engineering design, or informal science programs, they are more likely to develop a sense of belonging in STEM and to envision themselves as capable contributors to scientific work. Given that the teacher is widely accepted to be the primary determinant of student achievement, particularly in mathematics and science, investments must be made in the STEM professional development of teachers.⁸ Teachers need academic preparation and teaching resources to deliver engaging STEM instruction that will inspire students and put them on a path for future STEM pursuits.⁹

This body of STEM identity development research guided the LBJ Institute staff to focus on young children believing that helping young children have a successful early STEM experience will lay the foundation, grow their confidence in their ability to be successful in STEM, and inspire them to participate in future STEM opportunities that may ultimately lead them to pursue STEM post-secondary studies and career choices.

Computational Thinking and Young Children

A growing body of research from the past decade supports the claim that introducing computational thinking (CT) and coding basics early yields measurable cognitive, social, and academic benefits well beyond preparing them for future technology careers. When CT and age-appropriate coding activities are embedded in preschool and early elementary settings, children develop problem-solving routines, pattern recognition, sequencing skills, and persistence — capacities that support learning across domains such as mathematics, language, and social interaction. These findings suggest CT lessons scaffold children's ability to break tasks into steps, reason about cause and effect, and iterate on solutions — all critical executive-function abilities.¹⁰

Further, CT learning for young children is often social and narrative as children give instructions, explain sequences, and debug together. Such activities promote oral language development, vocabulary (especially directional and temporal terms), and communication strategies. Studies also report increases in collaborative problem solving and peer instruction during guided coding tasks, supporting social-emotional learning objectives valued in early childhood pedagogy.¹¹

Coding activities provide immediate feedback (visual, auditory, or physical) that helps children see the effect of their actions and encourages experimentation. This feedback loop fosters creative expression (children design stories, games, or simple animations) and a growth mindset, because learners repeatedly test ideas, observe outcomes, and revise, helping students to normalize and tolerate failure as part of design.¹²

Implementing CT for young children works best when activities are brief, play-based, and integrated into familiar routines (storytelling, block play, art, or dramatic play). Teachers should prioritize tangible and visual tools (e.g., robots, sequence cards, ScratchJr) that reduce syntactic load and emphasize conceptual understanding. Ongoing formative assessment and shared reflection (children explaining their thinking) help make CT visible and support transfer to other domains.¹³

The research findings on the importance of introducing young children to experiences that promote computational thinkings and coding basics was central to the LBJ Institute staff in selecting the curriculum focus that ultimately led to the Storymaking STEM Camp endeavor. Because CT lessons scaffold children's ability to break tasks into steps, reason about cause and effect, and test and refine solutions, the LBJ Institute staff believed that these skills are certainly central to STEM education but could also be generalized across multiple disciplines as they advanced in their schooling. Also, the collaborative problem-solving utilized in the camp, was designed promote oral language development and communication skills, as well as supporting social-emotional learning objectives valued in early childhood pedagogy.

Best practices in educator professional development

High-quality educator professional development (PD) is widely recognized as a critical lever for improving instructional practice and student outcomes. Recent research consistently demonstrates that PD is most effective when it is sustained over time, embedded in teachers' daily work, and grounded in evidence-based instructional practices rather than delivered as isolated workshops.¹⁴

One of the strongest findings in the recent literature is the importance of sustained, job-embedded learning. Short-term or one-time professional learning opportunities rarely lead to durable changes in

classroom practice. In contrast, PD that unfolds over weeks or months and is integrated into teachers' instructional routines—such as coaching cycles, collaborative lesson planning, or classroom-based inquiry—has been shown to produce more meaningful and lasting effects.¹⁵

Equally important is a clear focus on subject-specific content and instructional practice. Generic PD that emphasizes broad teaching strategies without attending to disciplinary context is less effective than PD that supports teachers in implementing concrete practices aligned with the content they teach. Content-focused PD enables teachers to engage with curricular materials, rehearse instructional strategies, and receive feedback that is directly relevant to their classroom responsibilities.¹⁶

Active learning and collaboration are other defining features of effective PD. Studies emphasize the value of opportunities for teachers to observe models of effective instruction, analyze student work, engage in lesson rehearsal, and reflect on classroom evidence. These active learning strategies support deeper understanding and promote transfer of new practices into instruction, particularly when paired with timely and specific feedback.¹⁷ Collaboration among educators further strengthens the impact of professional learning, shared goals and collective responsibility for instructional improvement.¹⁸ Instructional coaching has emerged as one of the most effective mechanisms for supporting teacher learning. Coaches provide individualized, job-embedded support that helps teachers apply new strategies, analyze student data, and refine practice through iterative cycles of improvement.¹⁹

The Storymaker Camp specifically embedded many of these findings in its design. For example, the instructional focus was on computational thinking and coding basics, and the implementation process was iterative in that it began with professional development, followed by teachers trying strategies in their own classroom and receiving coaching and support from program facilitators. Teachers then received a refresher two-day professional development session during which they were partnered with a co-teacher to plan and deliver instruction with children during the three-day camp. Program facilitators observed the camp activities with children and provided ongoing feedback to camp instructors and then led a debrief and support session each afternoon with camp instructors.

CONCLUSIONS

The conclusions related to this project are based upon evaluation and anecdotal data collected at the events, post-event data collections (interviews, coaching sessions and teacher reports), and researcher observations.

Evaluation and Anecdotal Data

Teacher participants were highly satisfied and complimentary of the training they received as reflected in their responses to the evaluation responses to the quantitative and open-ended items. For example, of the 25 teachers who attended the first year 5-day institute, 92% strongly agreed and 8% agreed that prior to the institute, their knowledge of computational thinking was limited. 100% strongly agreed that the institute was helpful to them and 92% strongly agreed and 8% agreed that they are likely to use the resources earned during this week in their classrooms. The comments they provided to the open-ended items confirmed that they absorbed the spirit as well as the content of the professional development. One participant wrote, “The pace flowed very organically. I felt that each activity easily went into the next. I felt as though each day was needed to move forward and gave me the foundational pieces I need to move forward.” Many participants commented on the instructors' approach and how much they valued it as is evidenced by this participant's comment, “The instructors value all the participants input and ideas. They are very approachable. The workshop was very well thought of and well-paced. I love the hands-on explorations. It also acts as a team building.”

In the second summer, the teacher professional development consisted of a refresher course and planning time for the co-teacher pairs to plan the upcoming three-day experience with preschool

children. 100% of the participants indicated that the camp materials met the needs of the activities delivered, and 67% strongly agreed and 33% agreed that after the two-day training they felt prepared on what they would be teaching during the camp. Teacher participants also indicated that the camp experience was beneficial to the students that attended (67% strongly agreed; 33% agreed). Comments to the open-ended items were positive as well such as “It was a great experience. I enjoyed the training and the camp. The only thing I would adjust is a little more time to ‘play’ in Scratch Jr. and Kibo (robots).” Another participant commented “The instructors knocked it out of the park for a second year in a row.”

The coaching sessions and the communications with teachers during each of subsequent school years focused on the realities of trying to integrate summer content and activities into an already crowded curriculum. During Year 1 at the first coaching session about 6-weeks into the school year, none of the teachers had been able to use specific activities from the summer experience citing that they were having students added to their classes, classes were being rebalanced as new teachers were added to their staffs, and that they were focused on trying to establish classroom routines with their students. They did, however, report that they were utilizing the approach of “letting students explore” rather than “giving them the answers” which program facilitators considered a major “take away” from what they were trying to emphasize in their training. As the year progressed, teachers began to report specific activities they were using with their children, a more inquiry-based teaching approach, and that they expressed surprise at how well students were doing with their independent explorations with the materials and technologies. In the subsequent schoolyear following the Year 2 summer experience, teachers were reporting integrating the content and activities to a higher degree in their classroom teaching, while still noting the challenges with an overcrowded curriculum that the school expected them to cover. One teacher reported, “I was able to integrate a few things from STEM camp. Such as, when we introduced circuits in fifth-grade science, I gave them the materials, but I didn't tell them how to light the bulb or what needed to happen. I let groups work together with the different supplies.” Another teacher participant wrote, “I have been able to take back some of the things from camp. During science we had a science experiment to get the car from the table to the floor with the driver “still alive” so no flipping off or stunts. I laid out the materials without any direction of which way they had to be used just with the objective. Unfortunately, with all the new curriculum and internalization weekly, we haven't had much free space to allow for many things, but I have tried to be more like our university instructors and let them explore and figure it out. I just need to trust the process for sure.”

Researcher Observations

Experiences in this project have reinforced several of the insights that we have found in earlier related project research. One such insight was that relying on the “best practices” for professional development resulted in the kind of teacher growth and buy-in that is necessary for true change in classroom practices. Such an approach, while more time and labor intensive, is what is necessary to accomplish desired goals, so moving forward, we will aspire to integrate this long-term, iterative approach to working with teachers. A similar insight relates to the tensions that result from the regimented expectations that exist for teachers who want to innovate in their classrooms.

In conclusion, when instruction is play-based, developmentally appropriate, and supported by trained educators and suitable tools, computational thinking activities strengthen problem solving, spatial and executive functions, language, creativity, and motivation — all foundational skills for later learning. To maximize benefits at scale, policymakers and program leaders should invest in teacher training, inclusive curricula, and reliable assessment methods so that early computational thinking education is effective and available to all children.

NOTES

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EXPERIENCING COLLAPSE: A PEDAGOGY FOR CO-CREATING CLIMATE AGENCY

Author:

ANDRE MŪRNIÉKS

Affiliation:

MASSEY UNIVERSITY TE KUNENGA KI PŪREHUROA, NEW ZEALAND

INTRODUCTION: THE MANDATE AS A WICKED PROBLEM

Most institutions approach sustainability through the cold lens of technical management: solar arrays, carbon offsets, and waste audits. While these are necessary metrics, the true barrier to Carbon Zero is cultural and cognitive. For the contemporary design student, the climate crisis is not a distant threat or a future hypothetical; it is a persistent background noise of existential dread — a state of "ecophobia" — that frequently leads to creative and emotional paralysis.¹ This paralysis represents a systemic blockage that prevents the next generation of practitioners from engaging with the tools of their trade in a meaningful, restorative way. When the future is perceived as a site of inevitable collapse, the motivation to build toward it evaporates.



Figure 1. Carbon zero and the simulated environment (expo), photographs by author

This course, Creative Collaboration 197.288, examines the pedagogical scaffolding required to move two hundred second-year design students from this state of paralysis toward a position of robust, collaborative agency. By framing the Massey University 2030 Carbon Zero mandate as a "Wicked Problem"—defined by Horst Rittel and Melvin Webber as problems that are ill-defined, circular, and rely on elusive political judgement—we explore how flipped learning, collective governance, and

speculative world-building can weaponise student creativity.² In a wicked problem, there is no "true" or "false" solution, only "better" or "worse" interventions.³ Every action is a "one-shot operation" because there is no opportunity to learn by trial and error without significant real-world consequences; thus, the studio must function as a safe yet visceral simulation of these high-stakes dynamics, where students confront the gravity of their choices without the fatalism of the external world — as depicted in Figure 1.

The true difficulty lies in the deep-seated scepticism toward institutional rhetoric. Students are acutely sensitive to "greenwashing" and the gap between an institution's stated goals and its daily operations. As one student, Karlana, reflected:

"My personal take on climate change and our roles as designers is that the best thing for us to do would be to stop designing... I enjoy designing but the idea that i am putting more unnecessary waste into the world is depressing and limits my ability to create. Massey still needs to do much more to become carbon zero, i feel as though it is [e]mbedded in the curriculum but still not acted on."

Karlana's sentiment highlights the "existential friction" inherent in modern design education: the realisation that the act of creation is often an act of consumption. This realisation creates a creative claustrophobia, where the fear of adding to the world's waste limits the ability to imagine new futures. This pedagogy intends to transform this depression into a "redesign of practice," moving the designer from a producer of objects to a facilitator of systemic intervention.

THEORETICAL FRAMEWORK: BEYOND THE BANKING CONCEPT

The Critique of Passive Deposits

We ground our approach in Paulo Freire's critique of the "Banking Concept" of education, where students are treated as empty vessels to be filled with "deposits" of expert knowledge.⁴ In the context of climate change, the banking model is particularly dangerous. If students are merely "told" about the crisis and "given" technical solutions, they remain passive spectators of their own demise, relying on a "technological salvation" provided by authorities. For our cohort, "unveiling the world" means stripping away administrative jargon to reveal the raw reality of ecological collapse. This moves students from being objects of history to being subjects who transform it.

The shift from passive receiver to active participant was noted by Charlotte, who found that the "wickedness" of the prompt acted as a bridge between disciplines that were previously siloed into their own technical bubbles:

"The Massey Net Zero carbon goal was unknown to me and most of my peers allowing me to take a point of view of the majority of my peers...[this course] was a relief to experience a new class with a different initiative, one that worked towards a collaborative project, connecting with more than the people in my own discipline as well as creating something open to the community around me."

Charlotte's observation suggests that collective agency is often found in the "relief" of shared responsibility. When the burden of the crisis is shared across a 200-person collective, the individual paralysis begins to thaw. By breaking down the walls between disciplines—Visual Communication, Spatial, Fashion, and Industrial Design—the pedagogy mirrors the multidisciplinary cooperation required to address planetary-scale crises.

Speculative Prototyping and the Studio Posture

We adopt a framework of Donald Schön's Reflection-in-Action⁵ merged with speculative design.⁶ By treating collaboration itself as a design object, students are forced to research their own social dynamics in real-time. Crucially, this requires a shift from individual authorship to "relational agency"—a capacity to offer and ask for support within a professional community.⁷ This posture allows students to treat "play" as a serious investigative tool, stress-testing how human behaviour

shifts under the pressure of scarcity or ecological threat. This is not "play" as an escape from reality, but as a rigorous simulation of possible realities.

As Finn reflected on their speculative intervention regarding plastic waste and "subconscious design," the focus shifted from informing the audience to affecting them:



Figure 2. Speculation and play, photographs by author

"Subconscious design is something I love, and this project was a good chance at working on that. We created something that people didn't really have to think about yet, they ended up learning a lesson... We masked it with this contraption and talking and the whole performance. But as they walked away, they had a piece of rubbish which (I hope) they thought about when they put it in the rubbish after."

Finn's experience illustrates the pedagogical move from explicit messaging—which is often ignored—to experiential learning. The "lesson" is not delivered via a lecture but through a physical encounter that lingers in the mind. The implication is that for climate agency to take root, it must move beyond the cognitive and into the visceral.

METHODOLOGY: SCAFFOLDING SPECULATIVE AGENCY

The Digital Nervous System

Managing forty-plus simultaneous speculative worlds requires a digital infrastructure that prioritises transparency over hierarchy. We operationalised a suite of ubiquitous tools (Microsoft Teams, Mural, and Google Sheets) as a "Digital Nervous System" (DNS).⁸ This system was designed to facilitate "mutual sensing," where the progress or failure of one team sent signals throughout the entire collective. In a wicked problem, information is the most valuable resource; the DNS ensured that no team was working in a vacuum — as depicted in Figure 3.

While the tools provided structure, the students found that the DNS also acted as a psychological motivator by fostering a culture of visibility and micro-accountability. Tamon noted:

"I completed work in a much more consistent and timely manner than if i'd been working alone. The regular updates and check-ins we had as a group prevented a lot of procrastination. These more frequent milestones are something I want to include more in my workflow going forward as I found it left me in a much better position when we got to the deadline."

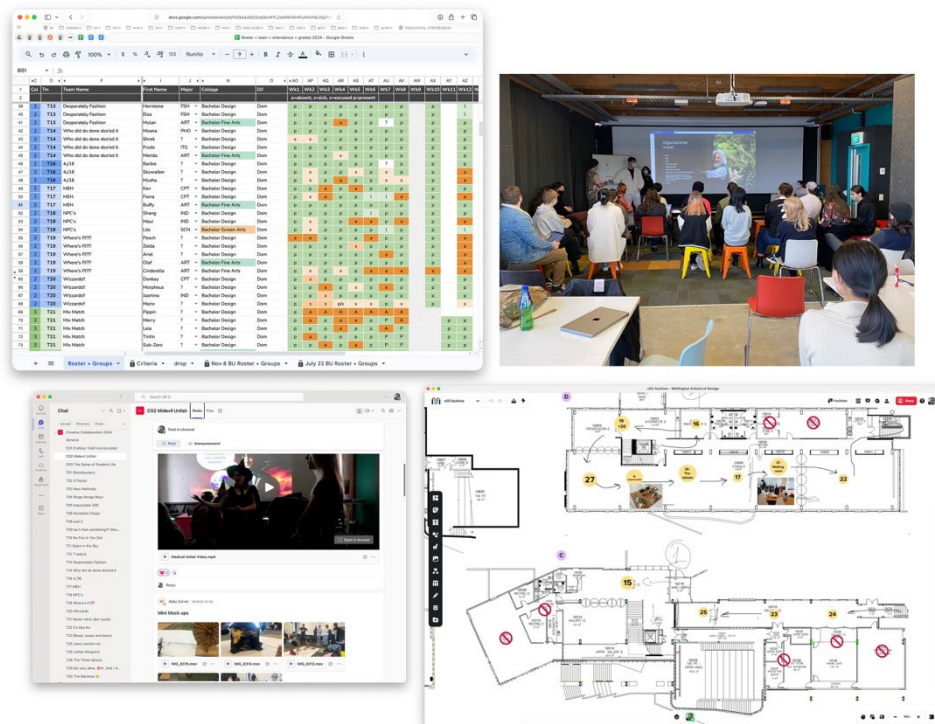


Figure 3. Groupware: Mural, Teams, Google Sheets, photographs by author

The implication here is that accountability in a wicked problem context is not about top-down surveillance from a tutor, but about the "inter-nodal" pressure of a functioning collective. When students see their peers making progress in real-time, it validates their own effort and reduces the isolation of the creative process.

Navigating Collective Governance

Working within a collective of 200 is inherently messy and prone to social friction. Relational agency is co-created in these moments of translational friction.⁹ In a traditional studio, the tutor acts as the arbiter of disputes; here, the "wickedness" of the climate problem—specifically its lack of clear consensus—was mirrored in the studio's governance. Tim observed the value of this friction as a vital professional rehearsal for the complexities of the real world:

"Ideas were very quick to get shut down in the larger group setting and this would then mean it felt like we were going around in circles quite a lot that then lead to feeling like we all weren't as prepared as we could have been... For me this was a very interesting learning curve as moving into the future in a creative practice will be something that we are all faced with quite frequently."

The "circles" Tim describes are not a failure of the methodology; they are the methodology. The "learning curve" here is the realisation that in systemic design, "being prepared" is not about having a perfect plan, but about having the resilience to navigate a process that resists closure. Navigating democratic gridlock is perhaps the most essential skill for the 21st-century designer, who must move between individual vision and collective compromise.

EXPANDED DISCUSSION: THE ARCHITECTURE OF RESILIENCE

From Screen to Sinew: The Tangibility of Crisis

A recurring theme in student feedback was the tension between the digital "design space" and the physical "intervention space." For many, the climate crisis is perceived through screens—data visualisations, terrifying headlines, and distant footage of disasters. This creates a digital-physical disconnect that reinforces paralysis. By forcing students out of their VCD silos and into physical construction, the pedagogy sought to ground existential dread in material reality. Marcyala noted:

"As a VCD student I also enjoyed when it came to building our expo, since for most of the time I am always on my computer... I never thought that since i am more of a reserved person that I would step up as much in more of a leadership role."

This transition from the binary certainty of the computer screen to the tactile ambiguity of the "build" is essential for co-creating agency — as depicted in Figure 4. Physicality demands a different kind of problem-solving—one that is inherently social and collaborative. When a material fails or a structure collapses in the studio, the solution is rarely found in an "undo" button; it is found in the collective intelligence of the group. This "physical socialisation" of design mimics the real-world infrastructure projects required for climate adaptation.



Figure 4. Interdisciplinary skills at play, photographs by author

The Friction of Interdisciplinary "Translation"

The pedagogy deliberately avoided pre-assigning roles, forcing students to negotiate their own interdisciplinary value. This created a site of intense "translational friction." A Visual Communication designer speaks a different conceptual language than a Spatial or Industrial designer. In our studio, these languages collided, often leading to the "circles" mentioned by Tim. However, this friction is where true systemic understanding occurs. Kayla's reflection on designing for "multiple senses" illustrates this expansion:

"As a VCD major I am more trained to look at the visual aspects of something but having to design for multiple senses... has been valuable for me to take on and not to take into all of my future work."

The "value" here is not just in learning a new skill, but in the humility of acknowledging that one's own discipline is insufficient to address the totality of a wicked problem. Agency is co-created precisely at the moment when a designer realises they cannot solve the problem alone. This requires a

"disciplinary un-learning"—a willingness to step outside the comfort of one's major to engage with the multisensory, often chaotic reality of a systemic intervention.

Time as a Material: Navigating the "Rushed" Reality

The climate crisis is defined by a temporal paradox: we are out of time, yet the solutions require deep, slow, systemic shifts. This paradox was mirrored in the students' experience of the course timeline. Emma reflected on the feeling of being "rushed":

"the first couple weeks felt super slow as we weren't doing much talk about our expo plans, then we were expected to have everything in a shorter time frame... everything felt so rushed and last minute." This sense of "slow-then-fast" is characteristic of wicked problems. The initial weeks of a project are often consumed by the "slow" work of social bonding, research, and dealing with the paralysis of choice. When the "fast" phase of execution arrives, it feels overwhelming. Pedagogically, we frame this not as a planning failure, but as a simulation of "Crisis Time." In the real world, climate action often stays in the "slow" phase of debate for decades until a tipping point forces a "fast," often chaotic response. By experiencing this temporal stress in the studio, students learn to manage their own cognitive load under pressure. They learn that "rushed" does not have to mean "poor quality," but rather "prioritised."

The Scepticism of the "Educational Consumer"

A significant barrier to co-creating agency is the prevailing "consumer-model" of higher education. Students like Thom expressed concern that the radical autonomy of the course might "compromise the quality of [their] university experience." This perspective views education as a product—a curated experience with clear, guaranteed outcomes.

"I hope their efforts won't compromise the quality of my university experience... the lack of structured guidance from teaching staff made it challenging to define project expectations and goals."

This scepticism is a vital data point. To co-create agency, we must address the "Educational Contract." If the crisis requires us to rethink everything, we must also rethink the relationship between student and teacher. The "frustration" Thom felt is a direct result of the removal of the teacher as the "source of truth." In the Anthropocene, there is no "source of truth" that can provide a comfortable roadmap to 2030. By refusing to provide "structured guidance" that eliminates risk, the pedagogy forces students to develop their own internal compass. Agency cannot be "given" through structured guidance; it must be "taken" through the struggle with ambiguity.

WEAPONISING PLAY: THE PERFORMATIVE EXPO

The semester culminates in Performative Expos—live interventions on campus that function as "protest-prototypes." Following Jeroen Weijdom's theories on performative prototyping, the "act" of the intervention becomes the primary site of knowledge generation.¹⁰ By forcing students to inhabit their speculative futures in front of a public audience, the stakes are elevated from the academic to the social. The design is no longer a static image on a screen; it is a lived encounter that demands a response.

Finn's group, for instance, used "subconscious design" to mask a lesson about plastic longevity within a "contraption" and "performance." This move toward the theatrical allows students to bypass the defensive mechanisms of their audience. Instead of "preaching" about climate change, they create an experience that the participant must navigate. This "masking" is a sophisticated design strategy that moves away from the "poverty of information" (the idea that people just need more facts) toward the "richness of experience" — as depicted in Figure 5.



Figure 5. Performative prototyping and experience design, photographs by author

THE PEDAGOGY OF FRUSTRATION AND SOCIAL REPAIR

We define the "Pedagogy of Frustration" as a deliberate design of educational obstacles intended to build "Social Repair" skills. In a world of increasing ecological and social fragmentation, the ability to "stay in the room" when things become difficult is a radical act.

The Value of "Going in Circles"

When Tim described the feeling of "going around in circles," he was describing the core of democratic life. The circle is not a dead end; it is the process of socialisation. In these circles, students learn to listen, to compromise, and to refine their arguments. They learn that "shutting down" an idea is not a personal attack, but a part of the rigorous testing required for a collective to move forward. This builds social resilience—the ability to face institutional or social gridlock without retreating into apathy.

Leadership as a Distributed Function

The shift in leadership dynamics was one of the most visible outcomes of the co-creation process. Marayla, who identified as "reserved," found that the shared pressure of the collective forced a "leadership role" out of her and her peers.

"this role my group equally shared at times when discussing our different ideas and opinions within our group and to the overall collective."

This "distributed leadership" is the opposite of the "hero-designer" model. It suggests that agency in the face of climate change is not about finding a single charismatic leader, but about creating a "leadership culture" in which everyone is empowered to step up when their specific skill set or perspective is needed. This is the model of "Mutual Aid" applied to design education.



Figure 5. Collaboration and performance, photographs by author

CONCLUSION: NAVIGATING THE FUTURE

The success of this model is measured not by the aesthetic polish of the final prototypes, but by the fundamental shift in student posture. Matt summarised this change in perspective, noting how the project altered his view of professional relationships:

"This paper has changed the perspective of how I think about design for an experience... It changed my perspective on how I think about working for a group or individual."

Finally, Chelsea's reflection captures the transition from macro-anxiety—feeling overwhelmed by the global crisis—to micro-agency—understanding how personal and professional choices propagate through the system:

"I learnt a lot about climate change and saw a lot of different ideas on how to create a more sustainable future. It's also made me more aware of my own consumption of plastics and how just by changing small things in your everyday life you can have a large impact on your own future."

By "experiencing" collapse through speculative play, students co-create a form of agency that is resilient, collaborative, and inherently defiant. They are no longer just designers of objects; they are navigators of a world in transition, equipped with the social and cognitive tools to build something meaningful from the ruins of the status quo. The "frustration" they felt was not a sign of failure, but the sound of old, passive habits breaking away to make room for a new, active, creative identity. We must move toward a pedagogy that does not promise comfort, but promises the capacity to act within discomfort. Only then can we truly begin the work of the 2030 Carbon Zero mandate.

NOTES

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BEYOND ACCOMMODATIONS: TRUST, TRAUMA, AND THE HUMAN TECHNOLOGIES OF LEARNING SUPPORT

Author:

JAMES FRASER

Affiliation:

ALL MINDS SUPPORT, UNITED KINGDOM

INTRODUCTION

Over the past decade, higher education institutions in the United Kingdom and internationally have seen a substantial increase in the number of students identifying as neurodivergent or requiring disability-related support.¹ In response, universities have expanded systems of reasonable adjustments and accommodations, formalised through disability services, learning support plans, and statutory frameworks such as the Equality Act 2010.² While these measures are essential for addressing structural barriers to access, there is growing recognition that accommodation-led models alone are often insufficient to support sustained engagement, wellbeing, and meaningful participation in learning.³

In practice, many students report that although adjustments may exist on paper, their lived experience of study remains marked by anxiety, exhaustion, and disconnection.⁴ For neurodivergent students in particular—including those with autism, ADHD, dyslexia, or dyspraxia—learning is frequently shaped not only by cognitive difference, but by prior experiences of educational failure, misrecognition, or adversity. These experiences can significantly affect a student's sense of safety, agency, and capacity to engage, even when formal accommodations are in place.

This paper argues that effective inclusive learning support requires a shift beyond a predominantly procedural understanding of access towards a more relational and trauma-informed approach. Drawing on practitioner experience within UK higher education learning support, it introduces the concept of human technologies of learning support: relational, embodied, and temporal practices that enable students to engage with learning in ways that feel safe, meaningful, and sustainable. These technologies are not digital tools or formal adjustments, but human capacities such as trust-building, attunement, pacing, co-regulation, and translation between institutional systems and student lived experience.

The concept of human technologies is grounded in interdisciplinary perspectives from neurodiversity studies, trauma-informed pedagogy, and relational theories of learning.⁵ From this standpoint, learning is not merely an individual cognitive process, but a relational one, shaped by the quality of interaction between students, educators, and support professionals. Where institutional systems prioritise efficiency, compliance, or standardisation, students who require relational safety and flexibility may continue to struggle, even when accommodations are technically present.

The paper is written from the standpoint of a practitioner working in one-to-one learning support roles within higher education. Rather than presenting a formal empirical study, it adopts a reflective and

conceptual approach, using practice-based insight to examine how relational forms of support function as enabling technologies within learning contexts. The paper first outlines the relationship between neurodiversity, trauma, and learning, then examines the limits of accommodation-focused approaches, before introducing a framework of human technologies of learning support and considering implications for educational practice and policy.

NEURODIVERSITY, TRAUMA, AND LEARNING IN HIGHER EDUCATION

The concept of neurodiversity has increasingly shaped understandings of difference within higher education, framing neurological variation—including autism, ADHD, dyslexia, and dyspraxia—as a natural form of human diversity rather than a deficit to be remediated.⁶ Within this paradigm, difficulties experienced by neurodivergent students are understood as arising not solely from individual impairments, but from misalignments between neurocognitive profiles and educational environments.

Despite this shift in framing, higher education systems remain largely organised around normative assumptions about attention, executive function, communication, and emotional regulation.⁷ These assumptions are embedded in assessment practices, timetabling, and pedagogical design, often privileging speed, autonomy, and consistency. For many neurodivergent students, such environments place sustained demands on cognitive and emotional resources, contributing to exhaustion, anxiety, and disengagement over time.

Trauma-informed perspectives offer a complementary lens for understanding these patterns. Trauma is increasingly understood not only as the result of discrete adverse events, but as the cumulative impact of relational and systemic stressors that overwhelm an individual's regulatory capacity.⁸ Within educational contexts, repeated experiences of misunderstanding, misrecognition, or punitive response can contribute to what might be described as educational or developmental trauma. For neurodivergent students, who are more frequently subject to such experiences, this risk is often heightened.

From a trauma-informed perspective, difficulties with concentration, memory, or motivation are better understood as adaptive responses to perceived threat rather than as indicators of low ability or effort. Research within relational and embodied theories of learning suggests that cognitive engagement is closely linked to emotional regulation and social context, and that executive functions such as planning, task initiation, and sustained attention are particularly sensitive to stress. When learning environments are experienced as unsafe or overwhelming, these functions may be compromised regardless of intellectual capacity; when relational safety is established, cognitive resources become more accessible.⁹

The intersection of neurodiversity and trauma is therefore particularly salient in higher education. Many students arrive at university with long histories of navigating systems that were not designed for them, shaping expectations of support, authority, and belonging. Within this context, learning support practitioners operate at the boundary between institutional systems and student lived experience, mediating not only academic content but also the relational conditions that make learning possible. This paper situates the framework of human technologies within this combined neurodiversity-affirming and trauma-informed perspective, arguing that access to learning is shaped as much by relational conditions as by formal adjustments.

FROM ACCOMMODATIONS TO RELATIONSHIP

Within higher education, disability support has increasingly been organised around systems of reasonable adjustments and accommodations. These systems are essential in addressing structural barriers to access and are underpinned by legal and ethical commitments to equity, particularly within

frameworks such as the Equality Act 2010. Adjustments such as extra time, alternative formats, or assistive technology play a crucial role in enabling participation. However, there is growing recognition that accommodations alone do not guarantee meaningful engagement with learning.

Accommodation-based models tend to frame disability support as a technical problem to be solved through procedural intervention: barriers are identified, adjustments are allocated, and responsibility is distributed across institutional systems. While this approach can be effective in addressing discrete access issues, it often assumes that once adjustments are in place, learning will proceed as expected. For many neurodivergent students, this assumption does not hold. Experiences of anxiety, exhaustion, sensory overload, and difficulties with initiation or organisation may persist, shaped by executive function differences and cumulative educational adversity. These factors are rarely captured within adjustment plans, yet they exert a powerful influence on everyday learning.¹⁰

A further limitation of accommodation-focused approaches lies in their tendency to individualise responsibility for engagement. Adjustments are frequently positioned as compensatory measures that enable students to function within existing systems, rather than as prompts for relational or pedagogical change. This framing risks positioning ongoing difficulty as personal failure, rather than as a predictable response to environments that remain misaligned with students' needs.

Relational approaches to learning support offer an alternative lens. From this perspective, learning is understood as a process that unfolds within relationships and is shaped by trust, safety, and mutual understanding. This shift does not reject accommodations, but situates them within a broader ecology of support in which the quality of interaction, attunement, pacing, and co-regulation become central enabling conditions for learning. In this sense, accommodations address access to systems; relationships address access to learning itself.

THE FIVE HUMAN TECHNOLOGIES OF INCLUSIVE LEARNING SUPPORT

Building on work presented at the AMPS Pedagogy Conference (2025), this paper conceptualises inclusive learning support through five interrelated human technologies: deep listening, co-regulation, social safety and trust, rhythm and flow, and co-created meaning. These technologies are not tools or techniques in the conventional sense, but relational, embodied, and temporal practices expressed through human interaction. While presented as discrete elements for clarity, they operate dynamically and in combination within learning support contexts.

The concept of human technologies emerges from the recognition that many barriers to learning are not primarily cognitive or technical, but relational and affective. Neurodivergent students may possess the intellectual capacity to meet academic demands, yet remain unable to engage due to anxiety, mistrust, sensory overload, or executive dysfunction shaped by prior educational experiences. Human technologies function at the interface between access and engagement, enabling students to mobilise existing strengths within conditions of relational safety.¹¹

Deep Listening

Deep listening refers to an attuned, responsive mode of engagement in which the support practitioner actively attends to a student's verbal, emotional, and embodied communication. This extends beyond hearing content or gathering information, and involves noticing pace, hesitation, fatigue, affect, and signs of overload. For neurodivergent students, whose internal states may fluctuate significantly, deep listening allows support to be adapted in real time rather than applied uniformly.

In practice, deep listening may involve slowing the pace of a session, shifting from abstract discussion to concrete planning, or recognising when task-focused work is no longer productive. These micro-adjustments are rarely specified within formal support plans, yet they often determine whether a

session is experienced as enabling or overwhelming. As a human technology, deep listening depends on presence and responsiveness, and cannot be standardised or automated.

Co-Regulation

Co-regulation refers to the process by which one person's nervous system helps stabilise and organise another's. It is a foundational developmental principle: humans do not learn to regulate themselves in isolation, but through repeated experiences of being regulated in relationship. Winnicott's concept of the holding environment describes how psychological growth depends on the presence of a reliable, attuned other who can contain distress and support the gradual emergence of self-regulation. From this perspective, the capacity to concentrate, to think, and to learn is not a purely individual achievement, but a relational one.¹²

Contemporary neuroscience reinforces this view. When threat is dominant, cognitive resources are diverted toward survival rather than learning, regardless of ability or motivation.¹³

For many neurodivergent and trauma-exposed students, educational environments are not experienced as neutral. Past experiences of misunderstanding, failure, or exclusion can leave academic spaces associated with vigilance, withdrawal, or defensive states, even in the absence of immediate danger. In such contexts, attempts to build skills or independence without first establishing relational safety may inadvertently reproduce the conditions that inhibit learning.

Co-regulation in learning support does not imply dependency or lowered expectations. Rather, it involves the intentional use of presence, pacing, tone, and attunement to stabilise the learner's nervous system sufficiently for learning to occur. Over time, these experiences are internalised, strengthening the student's own capacity for self-regulation. In this sense, co-regulation is not a substitute for independence, but the developmental pathway through which independence becomes possible.

Social Safety and Trust

Social safety is not a peripheral or "soft" concern in learning; it is a biological prerequisite for cognitive engagement. Polyvagal theory proposes that the nervous system continuously evaluates the environment for cues of safety or threat, and that states of safety support curiosity, social engagement, and flexible thinking, while states of threat shift resources toward defence and away from reflection and integration. From a trauma-informed perspective, learning environments must therefore establish sufficient safety and predictability before sustained cognitive engagement can be expected.¹⁴

For many students with neurodivergent profiles or histories of adversity, academic environments are approached with anticipatory threat rather than curiosity. Histories of misunderstanding, repeated failure, or institutional rigidity can make participation itself feel risky, so that avoidance, shutdown, or disengagement are better understood as protective adaptations rather than failures of motivation. In learning support practice, social safety is therefore rarely created through formal intervention alone, but through the micro-qualities of interaction: consistency, attunement, pacing, and relational reliability.

Rhythm and Flow

Rhythm and flow refer to the temporal dimensions of learning support: pacing, timing, and alignment with a student's cognitive and emotional capacity. Learning is inherently temporal, yet institutional timelines often assume a uniform pace that does not reflect neurodivergent processing styles. Difficulties with initiation, task-switching, and sustained attention can make conventional academic rhythms feel misaligned or punishing.

Human technologies of rhythm and flow address this mismatch by recognising the cognitive cost of transitions, breaking tasks into manageable temporal units, and adjusting expectations within sessions.

Importantly, this is not about lowering academic standards, but about aligning support with the student's capacity to engage at a given moment. When rhythm is misjudged, interventions can increase distress; when rhythm is attuned, students often demonstrate substantial capability.

Co-Created Meaning

Meaning in learning is not transmitted intact from one mind to another, but constructed in relationship. This is particularly visible in neurodivergent contexts, where differences in perception and communication style can render mutual understanding fragile if it is treated as a one-sided process. Milton's formulation of the "double empathy problem" challenges the assumption that communicative difficulty resides primarily within autistic individuals, proposing instead that breakdowns arise from mismatches between differently organised minds. This is supported by research showing that autistic-to-autistic communication is often highly effective, while difficulties are more likely to emerge across neurotype boundaries.¹⁵

Within learning support, this reframes the practitioner's role from remediator of individual deficit to participant in a shared meaning-making process, helping to translate between the student's internal logic, institutional expectations, and academic norms. Co-created meaning is therefore not a pedagogical luxury, but a precondition for engagement: learning begins not when the "correct" explanation is delivered, but when what is being asked becomes recognisably meaningful to the learner.

Taken together, these five human technologies offer a framework for understanding inclusive learning support as a relational practice rather than a purely procedural one. They make visible forms of labour and expertise that are often undervalued within institutional settings, despite their central role in enabling learning. By naming and articulating these technologies, the framework challenges narrow conceptions of accommodation and highlights the continuing importance of human presence in inclusive education.

IMPLICATIONS FOR PRACTICE AND POLICY

The framework of human technologies outlined in this paper carries important implications for both educational practice and institutional policy within higher education. While accommodations and procedural adjustments remain essential, the analysis suggests that inclusive support cannot be reduced to compliance or resource allocation alone. Instead, effective inclusion depends on relational conditions that enable students to engage with learning in sustainable and meaningful ways.

For practitioners in learning support roles, the framework foregrounds relational expertise as a core professional competence. Skills such as deep listening, co-regulation, and attunement are not supplementary to academic support, but integral to its effectiveness, particularly for neurodivergent students with histories of educational adversity. Recognising these practices as skilled labour has implications for training, supervision, and professional recognition, especially in contexts where relational work remains largely invisible within institutional metrics.

More broadly, the framework invites educators to attend to the relational dimensions of teaching and assessment. While not all staff work in one-to-one contexts, principles such as pacing, social safety, and co-created meaning remain relevant across learning environments. Small shifts in communication, rhythm, and expectation-setting can significantly influence students' capacity to engage, particularly when combined with formal accommodations.

At the level of policy, the framework challenges narrow interpretations of inclusion that prioritise documentation and compliance over lived experience. It also raises questions about the increasing standardisation and automation of student support systems. While digital tools and artificial intelligence may improve efficiency, they risk reproducing the limitations of accommodation-led

models if implemented without attention to relational context. Human technologies such as trust-building and co-regulation cannot be automated without loss.¹⁶

Finally, the framework suggests that inclusive education is not solely a matter of access to systems, but of belonging within them. In this sense, human technologies are not an optional enhancement to inclusive practice, but a necessary foundation for it.

CONCLUSION

This paper has argued that inclusive learning support in higher education cannot be understood solely through the provision of accommodations or procedural adjustments. While such measures remain essential in addressing structural barriers to access, they are insufficient on their own to support meaningful engagement with learning, particularly for neurodivergent students whose educational experiences are often shaped by trauma, misrecognition, and cumulative stress.

Drawing on practitioner insight and interdisciplinary perspectives, the paper has introduced a framework of five *human technologies* of inclusive learning support: deep listening, co-regulation, social safety and trust, rhythm and flow, and co-created meaning. These technologies describe relational, embodied, and temporal practices through which learning support becomes effective in practice. Rather than functioning as discrete techniques, they operate dynamically within relationships, enabling students to access cognitive capacity, sustain engagement, and experience learning as possible rather than overwhelming.

By situating this framework within broader discussions of neurodiversity and trauma-informed pedagogy, the paper has highlighted the limitations of approaches that prioritise compliance, standardisation, or efficiency over relational safety. It has suggested that inclusive education depends not only on what support is offered, but on how that support is enacted and experienced. In this sense, human technologies are not ancillary to learning support, but foundational to it.

The implications of this analysis extend beyond individual support roles to pedagogical practice and institutional policy. As higher education systems increasingly explore automation and technological innovation, there is a risk that relational dimensions of learning will be further marginalised. This paper argues for a more nuanced approach, one that recognises the enduring value of human presence and relational expertise within inclusive education.

Ultimately, the framework presented here invites educators and institutions to reimagine inclusion not as a checklist of accommodations, but as a relational practice grounded in trust, timing, and shared meaning. In doing so, it offers a way of understanding learning support that honours both the diversity of student experience and the human labour through which learning becomes possible.

NOTES

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THE AI OUCH MOMENT: A CONCEPTUAL FRAMEWORK OF ALGORITHMIC INJURY IN EDUCATIONAL SETTINGS

Author:

DARYA RAMEZANI, MICHAEL G. WAGNER

Affiliation:

DREXEL UNIVERSITY, UNITED STATES

INTRODUCTION

The discussions around AI in education are frequently polarized, often between the promises of personalized learning and the warnings of academic uselessness. Both extremes fail to capture what actually happens in the classroom. The overtly positive perspective often envisions a frictionless educational environment where artificial intelligence seamlessly adapts to the individualized needs of every student, maximizing efficiency. Conversely, the overtly negative viewpoint presents a landscape where critical thinking is entirely outsourced. However, this binary perspective often overlooks the immediate, lived reality of students and educators using these tools. Daily use of generative models and automated systems is defined by emotional frictions and uneasy compromises. The problem is methodological and linguistic since we lack the vocabulary to articulate the negative consequences of these interactions. Without precise terminology, the subtle emotional and cognitive friction that users experience is easily dismissed as mere user error or temporary technological growing pains.

This paper introduces the AI Ouch Moment to address this deficit. Our framework adapts the concept of “Ouch Moments,” originally defined as “... *ouch moments* are brief exchanges where an indignity, insult, or slight is expressed—whether intentionally or not—from one person to another.”¹ We define an AI Ouch Moment as a critical event in which an individual experiences a direct, negative, and emotional consequence resulting from an interaction with an AI system.

As automated systems become deeply embedded in public and private infrastructure, a growing number of individuals and communities encounter AI technologies as sites of tangible injury. While the harm in a human interaction often stems from intent or negligence, algorithmic injury is distinct because it is automated and impersonal yet deeply felt. A human teacher may accidentally insult a student through a poor choice of words, but an algorithmic system causes its harm through a cold, probabilistic mechanism that cannot be reasoned with in the moment. We propose that transferring this concept to human-computer interaction allows us to categorize harms that might otherwise be dismissed as mere technical glitches or user errors.

AI ethics traditionally prioritize macro-level issues like quantifying bias or auditing models to ensure fairness and promote transparency.² Yet, this systematic lens often overlooks the subjective, qualitative nature of the harm experienced by an individual. Harm is a lived experience that alters social reality and trust, not just a statistic in a dataset.³ A statistical variance in a model's accuracy does not capture the frustration, alienation, or diminished self-worth experienced by the user on the other side of the screen.

By naming these moments, we aim to provide a framework for understanding the human dimension of algorithmic effects on education.

METHODOLOGY

To investigate these phenomena, this study utilizes autoethnography. As described by Schwandt (2014)⁴ it is “a particular form of writing that seeks to unite ethnographic (looking outward at a world beyond one's own) and autobiographical (gazing inward for a story of one's self) intentions. The aim in composing an autoethnographic account is to keep both the subject (knower) and object (that which is being examined) in simultaneous view.” This methodological approach is uniquely suited for studying the emotional burdens of human-computer interaction, as it honors the researcher's direct engagement with the technology as a valid site of inquiry. We argue that because AI-induced harms are a deeply personal and evolving phenomenon, they require the narrative of lived experience that quantitative data alone cannot provide.

The typology presented in this paper is built from a reflective analysis of our own encounters with AI, combined with narrative accounts from students and stories shared by colleagues within the educational sector. Specifically, these autoethnographic observations were conducted by both authors during the 2024-2025 academic year while teaching within the Department of Digital Media at the Westphal College of Media Arts and Design at Drexel University. The primary settings for these observations were introductory game design courses taken by undergraduate students in the Game Design and Production program. Additional qualitative interactions were conducted with graduate students in the Digital Media program. It is critical to note that the students we observed and interacted with share a common, critical stance toward artificial intelligence, as generative technologies are actively encroaching on the specific creative domains that define their future career paths.

THE TYPOLOGY OF ALGORITHMIC PAIN

Based on our interactions, we categorize AI Ouch Moments into three domains including The Psychological Ouch, The Existential Ouch, and The Systemic Ouch (Figure 1).



Figure 1. Three categories of AI Ouch Moments.

The Psychological Ouch

The Psychological Ouch represents a continuum of cognitive and emotional harm that lowers the learner's internal sense of capability. This degradation is a gradual erosion of intellectual self-trust. It often begins with cognitive offloading, where a user relies on AI for simple tasks like brainstorming. While initially efficient, this reliance can transfer into learned dependence, where the user's confidence and skills in their own abilities diminish. The user begins to doubt their capacity to initiate

the creative process without AI assistance. The most severe manifestation is learned helplessness, a state where the student adopts the belief that their own intellect is inferior to the machine that leads to a termination of effort.⁵

The first author observed this friction firsthand during an AR development session while struggling to debug a script. She felt hopeless against a system that possessed technical capacity but no semantic empathy and eventually said outloud “*it is frustrating, it doesn’t understand what I want!*”. She experienced another “ouch” while attempting to generate a profile picture, when the GenAI’s outcomes repeatedly missed her intent and made her abandoning the creative iteration for a generic alternative. The resulting psychological ouch was a feeling of creative compromise.

Within this category we also identify a subcategory we call Epistemic Ouch, a betrayal of knowledge itself. When GenAI systems hallucinate fabricated sources or incorrect data, they force the student into intellectual vulnerability. Because the text is delivered with solid synthetic confidence, it functions similarly to gaslighting that could cause users to question their own foundational knowledge. This Epistemic Ouch extends to the policing of knowledge. As student narratives highlight, an injury occurs when students are falsely accused of academic dishonesty by AI detection software. The burden of proof is suddenly inverted. We witnessed students who were unable to prove their innocence against an algorithm’s accusation by pulling up file timestamps to prove their authorship. In these moments, the student is forced to prove their innocence against an algorithm’s probabilistic determination which in turn could create an environment of surveillance rather than trust.

The Existential Ouch

The Existential Ouch involves a disconnection from the work of learning, grounded in the Theory of Alienation.⁶ While traditional pedagogical concerns focus on what a student learns, this category of harm addresses how the student relates to their own intellect and creative output. This form of harm is an experience of self-estrangement, where the student or educator feels increasingly detached from their own intellectual labor and creative potential. Jaeggi (2014) describes this state as a “relation of relationlessness” which is a condition where one is involved in an activity but remains internally disconnected from it, unable to appropriate the actions as their own.⁷ In the context of AI-mediated education, this alienation manifests as a structural separation occurring across three distinct dimensions:

Alienation from the product

The work produced feels foreign to the creator which breaks the vital link between effort and ownership. In traditional pedagogy, the essay, the code or artwork is an extension of the student’s identity which reflects their footsteps and intellectual growth. However, when a student relies on generative AI to produce the bulk of an assignment, this relationship is fractured. The final product no longer bears the distinct imprint of the student’s cognitive struggle. The first author experienced this fracture during a game analysis assignment in her class. She received 10 nearly identical essays, all characterized by ChatGPT style. The analyses were superficial hovering around generalities without ever penetrating the depth of the game’s mechanics or narrative. As an educator it was a double pain, one was the loss of student’s unique voice and the realization that she was essentially grading a ghost. Recent studies suggest that this results in a spectator effect where the user observes the final product rather than birthing it. One educator described the experience of reading a student’s submission that was clearly AI-generated as a “*punch to the gut.*” As noted in research, this leads to a diminished sense of ownership and authorship, where the final output confronts the student as a detached identity.

Alienation from the process

If the product is the destination, the process is the journey of learning. Alienation from the process occurs when the rich, often messy struggle of research and drafting is replaced by the mechanical efficiency of prompt engineering. This is a form of powerlessness and meaninglessness where the individual manages the machinery of production but loses contact with the intrinsic value of the activity.⁸

In this state, the student is reduced to a manager of algorithms rather than an architect of thought.⁹ The injury is felt through a loss of agency as the student does not write, they process, and in doing so, they become estranged from their own thinking.

Alienation from potential

Perhaps the most painful realization is that an AI can perform tasks once viewed as uniquely human expressions of intellect and creativity. When creative expressions such as writing a poem are outsourced to an algorithm, the student is effectively severed from the activities that define their human distinctiveness. This creates a sense of obsolescence. *“I hate AI because it steals my artwork”* one student admitted during a class lesson that shows a fear that their creative identity was being extracted rather than supported. A colleague echoed this dread regarding their career that *“It’s not that AI is going to steal my job; because it feels like it already has.”*

This leads to a crisis of purpose. If a machine can replicate the highest forms of human expression in seconds, the student may wonder what the point of their effort is. This extends from an academic question to a psychological injury. It leaves the learner in a state of passive consumption rather than active creation.

The Systemic Ouch

The Systemic Ouch happens when AI systems reproduce societal inequalities behind a facade of technological objectivity. While dominant paradigms in AI ethics have focused on quantifying bias and ensuring fairness in datasets, this technocentric view often overlooks the subjective qualitative reality of the harm. Current debates surrounding big data and machine learning heavily prioritize the quantification of bias and dataset calibration. Yet, this engineering-centric framework misses the lived experience of the user. The systemic ouch is the moment this statistical bias makes contact with a human being.

In educational settings, this injury shows through biometric, linguistic, and representational failures. When a proctoring software cannot recognize darker skin tones, the interface functionally delegitimizes the student's physical presence.¹⁰ The technology erases them and inflicts a representational wound.

This exclusion extends to automated linguistic policing. Natural language processing models and automated evaluation systems have been found to generate covertly racist decisions about individuals based purely on their dialect. An example is automated grading systems that penalize non-standard English dialects policing student identity by treating cultural linguistic variations as errors.¹¹ A student communicating in African American Vernacular English (AAVE) or specific regional dialects may find their intellectual contributions structurally devalued by an AI tutor or essay grader. The system forces the student into a continuous, exhausting cycle of code-switching to be registered as competent by the system, stripping away their authentic voice to conform to the machine's homogenized biased standard.

Such technological marginalization in schools serves as a direct pipeline to broader socio-economic exclusion. The harm is deepened by language models that reinforce gender or racial stereotypes¹² projecting biased societal limitations onto the student's learning environment. The statistical models

deployed in education closely mirrors the algorithmic bias currently prevalent in talent acquisition and hiring platforms. If a student repeatedly learns in the classroom that their face or their voice is fundamentally "incompatible" with algorithmic assessment, this systemic ouch serves as a grim primer for a lifetime of digital marginalization. The educational environment, rather than serving as an equalizer, ends up training the student to expect rejection from the automated gateways of the modern workforce.

The resulting algorithmic injury is a painful double burden. First, the user suffers the immediate, acute harm of the bias itself, the sting of being unseen or misunderstood. Second, they are saddled with the exhausting secondary burden of proving that a system widely marketed and institutionalized as "neutral" or "objective" is, in fact, biased against them. In an academic power dynamic where the algorithm's output is presumed flawless by default, the marginalized student's valid experiences of harm are too often dismissed as user error. This denial deepens their systemic alienation.

INTERSECTIONS OF ALGORITHMIC PAIN: COMPOUNDING THE OUCH

While categorized distinctly for analytical clarity, the Psychological, Existential, and Systemic Ouches rarely occur in isolation within the lived experiences of students and educators. Instead, these domains frequently overlap, compounding to create a cascading effect of algorithmic injury. For instance, a Systemic Ouch often serves as the catalyst for deeper psychological and existential harms. When a student communicating in a specific regional dialect or African American Vernacular English (AAVE) is structurally devalued by an automated evaluation system, they do not simply experience systemic exclusion. This marginalization immediately triggers an Epistemic Ouch: a psychological betrayal where the student is forced into intellectual vulnerability and may begin to question their own foundational knowledge.

Over time, this repeated psychological friction metastasizes into an Existential Ouch. Stripped of their authentic voice in an exhausting cycle of code-switching to conform to a homogenized standard, the student becomes structurally alienated from their own intellectual potential, ultimately leaving them in a state of passive consumption rather than active creation.

Similarly, the initial Psychological Ouch of cognitive offloading frequently acts as a gateway to existential harm. What begins as a seemingly minor psychological compromise, doubting one's capacity to initiate a creative process without AI assistance, gradually fractures the vital link between effort and ownership. Consequently, the individual transitions from experiencing a localized psychological frustration to a profound alienation from both the learning process and the final product. Recognizing this compounding nature is essential, as it demonstrates that algorithmic injuries are not static, isolated events, but progressive trajectories that can systematically dismantle student agency if left unaddressed.

Because these compounding algorithmic injuries threaten a student's fundamental academic identity, our observations suggest that the emotional response often follows a trajectory remarkably similar to the stages of grief.¹³ Initially, students may exhibit *denial*, minimizing the AI's capabilities or refusing to acknowledge how deeply it is altering their field. This frequently shifts into *anger*, directed either at the opaque systems that misunderstand them or at the educational institutions mandating their use. As the reality of the technology sets in, users often engage in *bargaining*, endlessly tweaking prompts, altering their dialect, or code-switching in a desperate attempt to find the "magic words" that will force the machine to validate their authentic intent. Eventually, this leads to a form of *acceptance*. However, pedagogical intervention must ensure this acceptance does not devolve into passive resignation or learned helplessness, but rather serves as a threshold for critical action where the technology is reframed from an existential threat to an auditable tool.

CONCLUSION

The “AI Ouch Moment” provides a critical lens for understanding the human dimension of algorithmic impact in education. By naming the injuries, we validate the lived experiences of students and educators who find their agency and identity diminished by automated systems. Validating this experience is crucial, as it shifts the blame away from the individual user and correctly attributes the friction to the design and deployment of the algorithmic system itself. As this paper argued, finding the vocabulary and naming the harm is the first step toward addressing it.

Our autoethnographic findings reveal that among emerging digital media practitioners, the Existential Ouch, characterized by a profound fear of obsolescence and alienation from the creative process, is a highly prevalent and paralyzing harm. For educators, this indicates that the immediate challenge of AI integration is not merely technical, but deeply psychological and identity-based. Individual ouches go beyond isolated events as they aggregate into larger institutional patterns.

The goal is to transform the trajectory of these interactions. By identifying these moments, educators can transform them from Ouch Moments to teachable moments. These teachable moments can serve as vital interventions and prompt discussions about technological design and digital agency. For example, when an Epistemic Ouch occurs via an AI hallucination, educators can deploy a "Reverse-Engineering the Error" exercise. Instead of simply correcting the false data, students critically analyze the probabilistic mechanics and prompt structures that led the system astray, converting an intellectual vulnerability into a hands-on lesson in algorithmic auditing. Similarly, to address the Existential Ouch, educators can assign "Iterative Contrast" exercises where students compare a purely AI-generated game narrative with one born from their own human struggle. This actively highlights the distinct value of their unique cognitive imprint over generalized, mechanical efficiency.

Finally, to confront the Systemic Ouch, educators might implement an "Algorithmic Audit" assignment. In this exercise, students intentionally stress-test generative image or language models by prompting them with diverse demographic identifiers, regional dialects, or non-standard cultural contexts. By documenting where the system fails to accurately represent marginalized groups or defaults to biased stereotypes, students learn to recognize these systems not as objective arbiters of truth, but as deeply flawed reflections of their training data. This practice transforms the passive sting of systemic exclusion into an active, empowering exercise of critical technological resistance.

Future research should expand beyond this initial typology through larger scale qualitative studies to validate these categories. Recognizing the ouch allows us to move from individual pain to a collective pain. By centering the human experience in the age of AI, we ensure that while the tools of education may become increasingly automated, the purpose of education remains human. To support this, there is an urgent need for the development of pedagogical resources that prioritize critical AI literacy.

AI DISCLOSURE STATEMENT

AI tools were used in editing this paper. Gemini pro 2.5 was used in creating the image shown in Figure 1. Gemini pro 3 assisted with the final editing of the text.

NOTES

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- ⁵ Darya Ramezani and Michael Wagner, "Redefining Student Agency in the Age of GenAI," in *EDULEARN25 Proceedings* (Valencia: IATED Academy, 2025), 7104, 7107, <https://doi.org/10.21125/edulearn.2025.1753>.
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- ⁷ Jaeggi, *Alienation*, 1.
- ⁸ Melvin Seeman, "On the Meaning of Alienation," *American Sociological Review* 24, no. 6 (1959): 783-91, <https://doi.org/10.2307/2088565>
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AN ACTIVE APPROACH TO ENHANCE THE CRITICAL AND ETHICAL USE OF GENERATIVE AI IN THE RESEARCH PROCESS

Authors:

ELENA FORASACCO, CHRIS COOLING, JAMES DESLAURIERS, JOHN PINNEY

Affiliation:

IMPERIAL COLLEGE LONDON, UNITED KINGDOM

INTRODUCTION

The increasing use of GenAI tools has prompted higher education institutions to redefine their regulations as well as to offer learning opportunities for students and staff to limit the misuse of GenAI. Given the rapidly changing landscape of available GenAI tools, offering specific advice can be difficult. Instead, educators should focus on the critical and ethical use of GenAI.

This paper explores how our three training initiatives promote the critical evaluation of GenAI outputs in the context of the participants' own needs, values, and constraints, providing them with lifelong learning.

Context

We work in the Early Career Researcher Institute (ECRI) at Imperial College London where we deliver professional development training for Early Career Researchers (ECRs), from doctoral students to postdocs and fellows. Our mission is to enable them to effectively complete their research projects as well as equip them with tools for their future careers in academia and beyond.

Our training offer spans from transferable skills, such as research communication and research integrity, to technical skills, such as research computing and data science. In this paper, we focus on the three workshops we offer to students to enhance the critical and ethical use of GenAI in the research process: two workshops in ECRI for doctoral students, and one workshop in the Business School for MSc students.

One of the ECRI workshops relates to the critical assessment of GenAI outputs when writing a literature review, and the other relates to how GenAI can be used to assist programming. The Business School workshop relates to the responsible use of AI for information searching and idea generation.

In our workshops we explore how participants are already using GenAI in their research, and we challenge them to think more deeply about what may be gained or lost in the process.

Pedagogical background

We work with adult learners, in some cases with significant employment experience, on the enhancement of their professional development competencies. Hence, we applied the principles of the framework for adult learners¹ to design our courses: adult learners prefer to self-direct their

studies, use their knowledge and competencies to work on real-life examples and co-create knowledge with peers and educators. Our design is based on active learning approaches to meet this framework since it allows collaborative co-creation of knowledge, respecting the individuals' experiences² in a safe learning environment.³

Our approaches are based on such “*intelligible (understandable), plausible (reasonable) and fruitful*”⁴ activities to prepare students for their current and future career.⁵ We provide students with authentic experiences, they apply critical thinking to analyse different perspectives and develop new ideas.⁶ Students' engagement increase while working on authentic experiences, they develop a “*mindful commitment*”.⁷

Our active learning approaches are grounded in social constructivism⁸ since we believe that learning is “*a sociocultural dialogic activity — a social constructivist or sociocultural approach*”,⁹ especially with adult learners. ‘Being a doctoral student’ is an individual process, but the competencies needed to complete a doctorate are socially developed.¹⁰

We deliver our courses to interdisciplinary groups of students. We therefore design scaffolding approaches with developmental stages (Bruner's three-stages of scaffolding¹¹) to enable all students to build the same knowledge by the end of each course. When students work in groups with different levels of knowledge, they expand their individual's Zone of Proximal Development (ZPD)¹², enhancing their knowledge.¹³

Our scaffolding approach begins with simple activities, we provide guidance, support and resources. Once students are more confident, we gradually remove it to allow them to socially construct their learning.¹⁴ Finally, we give time for individual reflection to allow the internalisation of the new knowledge to connect the learning with their own needs.¹⁵

WORKSHOP 1: GENERATIVE AI IN THE RESEARCH PROCESS

This workshop was designed to meet the students' needs and to facilitate the understanding of the institutional regulations regarding the use of GenAI. Students are already using GenAI tools to enhance their efficiency when working on their research projects. Our aim is to prompt them to consider and critically evaluate the strengths and weaknesses of those tools, and how to use them responsibly in alignment with the institutional regulations.

Workshop design and rationale

Following the definition of the intended learning outcomes (Table 1), we designed the workshop with four sections, one for each outcome. The workshop is student-centred, students co-create their learning through activities facilitated by us, the educators. We included individual reflection tasks so that each student has time to identify the potential of GenAI to support their individual needs.

Section	Intended Learning Outcomes	Activity
1	Identify the institutional rules regarding the use of GenAI	Educators explain rules and their rationale
2	Recognise the strengths and limitations of LLMs as tools for supporting the writing process	Educators facilitate the discussion about the use of AI tools
3	Write prompts for a LLM to elicit useful information on a specified technical topic	Educators briefly show a prompt engineering approach; students apply it to create a summary of their research projects.
4	Critique the output of an LLM	Students work in group in a simulation activity

Table 1. Synthesis of the workshop design.

How students work

The main group activity is the critical analysis of two summaries that each student prepares about the topic of their research project: the first summary without the use of GenAI, the second with the use of GenAI. Students prepare the first summary as a pre-workshop task, using these instructions:

‘Prepare a short introduction (250 words) with no LLMs about the general topic of your project, understandable by master students’.

We defined those instructions since all our workshops are attended by interdisciplinary groups of students, we do not want to overload students with subject-specific knowledge.

At the workshop (Table 1), section 1 is an introduction to GenAI, where students explore what the institution allows and what it has prepared for students.

In section 2 students share their experiences with GenAI: the tools they have used, their potential and limitations, and instructions.

In section 3, we share a strategy to write effective prompts to obtain focussed output from any GenAI tool. Students then apply this strategy to create the second summary of their research project, using these instructions:

‘Use the same topic you used for the pre-course task and ask an LLM to explain your topic (max 250 words) by:

- suggest relevant papers on this topic
- create a summary based on these works
- ask for specific improvements
- Do not upload the text you have already created
- Copy both of your texts into the same Word document
- Label one version A and the other B. You decide which is which; keep this a secret from the other group members’.

In section 4, students use their Word documents for the simulation activity. Students are divided into groups of four from a similar field; they rotate the Word documents three times; at each rotation they take on a role (doctoral supervisor, journal reviewer, reader) and offer feedback on each other’s texts based on their role. At the end of the rotations, each student receives back their Word documents and reflects on the comments received. After their reflection, they work again as a group to define pros and cons of the use of GenAI and a set of guidelines to support the critical use of GenAI.

Students’ learning

In the anonymous feedback form students filled at the end of the course, as part of the ECRI course evaluation process, students highlighted the learning of prompt engineering: *“Learning about how to prompt to get the answers you’re looking for”*.

Students realised the limitations GenAI has: *“Negative aspects of AI or how to AI can mislead the user”* and *“The potential risks of using gen AI to support my writing”*.

Students mentioned the effectiveness of our workshop design: *“I found the material presented in slides very helpful, as well as the activity to compare two written samples from human vs AI”* and *“Writing the prompt and analysing within small groups was great”*.

Since our workshop is open to students with different levels of knowledge, students used our workshop to learn about GenAI: *“I have never used generative AI before so it was interesting to learn about what it can do”*. This comment highlights the need for this workshop as an opportunity to enhance critical thinking when using GenAI, and as an introduction to GenAI.

Educators' perspectives and learning

Designing and teaching this workshop was rewarding, we were surprised by the maturity of students. We observed high student engagement because of the agency we give to students: the workshop represents an opportunity for them to share their experiences and knowledge, explore new concepts and expand their knowledge. Reflection is a key: students work and learn in groups; individual reflection allows each student to internalize the learning and adapt it to their individual needs.

As future developments we might enhance our scaffolding by giving more resources as preparatory tasks to support students with little experience with GenAI in order to have even more meaningful discussions during the workshop.

WORKSHOP 2: INTRODUCTION TO AI-ASSISTED PROGRAMMING

This two-hour workshop is offered to Early Career Researchers, and attendance is entirely optional. It runs around three times a year, with about 20 attendees at each iteration. The workshop aims to help attendees learn to use generative AI tools to help them program. Its ILOs are:

- Describe the basics of how GenAI works.
- Discuss common ethical considerations around the use of GenAI in the context of programming.
- Evaluate when it is appropriate to use AI assistance when programming.
- Use a common GenAI tool to assist programming, including critically evaluating its output.
- Design prompts most likely to produce useful outputs.

To start the workshop, I describe the basics of how GenAI works. Although many students will already be familiar with this, it is important to make sure all students have a good grip of the basics, and the nature of GenAI is important to understanding the discussion which follows. This involves discussing the limitations of GenAI including hallucination, sycophancy, data security, and bias. Other ethical issues relating to environmental impact, ethics, and academic integrity are then highlighted. Whilst this introduction to the course is not directly related to programming and mostly illustrates the limitations and problems associated with GenAI, it is important to include as it qualifies the recommendations which follow. During this section, I give some examples which are deliberately light-hearted in nature to maintain engagement but are also carefully chosen to illustrate the points being made. Attendees are also encouraged to experiment with a GenAI tool to replicate some of these limitations firsthand.

In the next section, I demonstrate how to use GitHub Copilot in the Visual Studio Code editor. GitHub Copilot and Visual Studio Code are far from the only tools available but are chosen because they are both freely available (with Copilot requiring registration as a member of a university to be used for free), popular and general-purpose. This is important to make sure the course is as relevant as possible to the audience, which is diverse in terms of discipline and preferred programming language. When attendees arrive at the workshop, most are using a web-based interface such as ChatGPT with a separate editor containing the actual code of their project. They use this setup by copy-pasting code backwards and forwards between web tool and the code editor. One of the main goals of the workshop is to help them transition to using a better setup. The combination of Visual Studio Code and GitHub Copilot integrates the GenAI tool into the programming environment, which brings several advantages. Firstly, the AI model can see a larger selection of code in a project, giving it more context, which improves accuracy. Secondly, no copy-pasting is required, which dramatically improves efficiency. Thirdly, Copilot can make changes directly in the code (with the approval of the programmer), speeding up the process, and reducing user error in the transcription process. Finally, Copilot can access tools within the editor, performing tasks such as running tests. When tests fail, Copilot can iterate until the code fulfils the requirements of the tests. This dramatically improves the speed and accuracy of the process of using a GenAI programming assistant.

As I show students how to use various features of GitHub Copilot within the Visual Studio Code interface, I focus on how to use it to solve small practical problems. Attendees are encouraged to copy what I do on their computer in real time so they can get used to using the interface. This is designed to both teach how to use GitHub Copilot, and to demonstrate its advantages over using a web-based AI in a separate browser to motivate them to change their practice. To conclude this section, I discuss data privacy in relation to GitHub Copilot, with a focus on issues relevant to researchers, and discuss some GitHub Copilot settings I recommend attendees adjust to ensure data privacy.

The remainder of the course covers some common programming tasks a user might want to undertake. These are split into three categories: examining existing code, modifying existing code, and writing new code. In these sections I introduce some scenarios relevant to programming for research where an AI assistant might be helpful, give some tips for using it for this task, demonstrate it on an example problem, then ask attendees to try it out on a related problem. This section of the course aims to inspire attendees to use AI assistance in a wider range of situations and give them experience in doing so. Improving the confidence and competency of attendees is the focus of this section.

The response to the course has been positive. Attendees have generally reported that they intend to switch to using GitHub Copilot, report an increased awareness of the applications of GenAI assistants for programming, and describe an increased confidence and perceived competence in using these tools. In these senses, the workshop has been a success in improving the critical use of GenAI tools for programming in the Early Career Researcher community in Imperial.

WORKSHOP 3: LEARNING TO LEARN WITH AI

Learning to Learn with AI is a 90-minute workshop for new students at the Business School. The largest and primary audience for the workshop is the MSc cohort. Workshops are in-person, led by two facilitators and can support groups of 80 – 120 students, but versions for smaller or online groups are also made available.

This workshop is, for most students, a first introduction to GenAI within the context of teaching, learning and assessment at Imperial and the Business School. The session aims are the following:

- Motivate the responsible (critical and ethical) use of GenAI for learning and assessment
- Highlight Business School guidance around GenAI in teaching, learning and assessment
- Share best practice and limitations of GenAI for learning and assessment

Workshop design and rationale

The need for a session around responsible use of GenAI at the Business School was first identified in Summer 2025, by a working group of members from within the Business School. The idea for a workshop came around in response to student and faculty feedback, which reflected a desire for 1) clearer messaging around guidance and explicit training on the critical and ethical use of GenAI and 2) AI fluency in general. The workshop is in two parts, to address these two needs.

The first part of the session is a 20-minute lecture which begins by motivating why responsible use and guidance are important. We point to Imperial student surveys and the annual *Student Generative AI Survey*¹⁶ from the Higher Education Policy Institute to recognise that GenAI use is widespread in Higher Education and discuss how over-reliance on GenAI can lead to poor performance and outcomes. We draw on data from the Imperial Careers team and sources like the Digital Education Council's *AI in the Workplace* report¹⁷ to identify in-demand skills such as critical and analytical thinking, ranked number 1 and the ability to work with AI, ranked number 2. The facilitator then highlights key guidance and signposts students to key resources around Imperial. This section

concludes with a definition of critical thinking and examples of ways we can think critically, to scaffold students for the next section.

The second part of the session, lasting up to 70-minutes, sees students work with GenAI to either generate ideas or retrieve information. This section is taught in an inductive teaching style, with students uncovering best practices, limitations and the importance of critical and ethical thinking on their own.

How students work

Students work on one of three tasks, using GenAI to either generate ideas, create material or retrieve information. Students work in three sequential modes: first on their own, then in pairs and finally as a larger group. Students are asked to think critically, using the framework presented at the end of the lecture section, about their inputs to GenAI as well as the response they receive.

Throughout the session, a facilitator calls on students and groups to identify limitations and best practice for the task at hand and discuss where and why critical or ethical thinking is important. The tasks vary slightly depending on the audience, the size of the group and the delivery format (in-person/online), an example is:

“Use GenAI to brainstorm ideas around a given topic. Refine the list on your own then compare the list in pairs. In a larger group, narrow down the three most important ideas and prepare a 1-minute presentation using one piece of flipchart paper.”

There is a similar task in information retrieval, which has students prepare a comparative analysis of two journal articles. A third task in ideation and creation asks students to prepare and pitch a study aid that uses GenAI.

Students’ learning

Students do well to uncover and identify how engaging responsibly with GenAI can help define best practices and limitations for the task at hand. For example, when students on the brainstorming task first compare their lists, they find significant overlap in the ideas generated and identify originality as a limitation. They find that by iterating with the model and by drawing on their own experience and knowledge, they come up with more novel ideas. When best practices, limitations and ideas around responsible use are missed by the students, the facilitator helps students discover these or alternatively identifies them outright.

Educators’ perspectives and learning

Student engagement with these sessions has been excellent – students are keen to get involved in the tasks and are eager to share their thoughts on best practices, limitations and responsible use. Feedback from both students and faculty has been positive and there is anecdotal agreement that student AI literacy and fluency has improved.

However, given that GenAI is becoming more and more widespread, it is difficult to identify how much of that improved AI literacy is general knowledge that students arrive with, and how much is driven by our Learning to Learn workshops. For future planning, this marks an important area to consider, along with updating guidance and the workshop in response to advances in the field of GenAI.

CONCLUSION

Observing students actively engaged in our workshops showed us that we achieved our aim ‘enabling students to be critical when using GenAI’ since GenAI can be useful for research. While working on the tasks we could see their critical mindset evolving; by the end of the workshops, they enhanced their critical awareness of strengths and limitations of GenAI tools.

Telling students what to do is not enough; we might tell them how to use a tool now, and in a few months that tool will be obsolete; in our workshops they ‘learn’ how apply their own critical thinking to select the GenAI tool to use, to use it and to assess the output.

ACKNOWLEDGEMENTS

Many thanks to the co-creators of the *Learning to Learn with AI* workshops: Cloda Jenkins, Associate Dean, Education Pedagogy and Innovation; Heather Mack, Director of Strategy & Operations, IDEA Lab and Stephen Vaz, Director of Learning Innovation, IDEA Lab.

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AT THE CROSSROADS OF LAW, MEDICINE, AND PUBLIC HEALTH - PEDAGOGICAL LESSONS FROM A MIGRANT LEGAL AID CLINIC IN FRANCE

Author:

LYNDA SIFER-RIVIERE

Affiliation:

UR EST, UNIVERSITE PARIS SACLAY, FRANCE

INTRODUCTION

How are forms of knowledge, judgment, and responsibility produced and learned at the intersection of law, medicine, and public health within a volunteer-based activist migrant legal aid clinic? This paper examines such a clinic as a pedagogical site emerging from the practical articulation of legal assistance, medical vulnerability, activist engagement, and digital coordination. While much pedagogical research continues to focus on formal institutions such as universities, professional schools, and state training programmes, this study shifts attention to a marginal yet increasingly important site of learning: a volunteer-based legal aid clinic that supports precarious migrants in accessing asylum, healthcare, and legal rights.

Across Europe, migration governance is characterised by legal instability, accelerating procedural change and institutional hostility. In France, for example, asylum law is frequently reformed, medical criteria for legal protection are constantly reinterpreted, and administrative procedures are increasingly digitised. In this context, both migrants and those who assist them must operate under conditions of permanent uncertainty. This paper argues that such uncertainty does not merely hinder action, but actively produces distinctive forms of learning. Within the clinic studied here, volunteers, interpreters, healthcare professionals, lawyers and migrants collectively learn to interpret ambiguous legislation, provide care without causing harm, triage risk with incomplete information and coordinate action through fragile digital infrastructures.

Between 2016 and 2024, I conducted long-term embedded ethnographic research within this clinic, initially as a volunteer and subsequently as a trainer, care referent and coordinator. This insider position over a long period of time provided access to everyday practices, dilemmas and forms of knowledge production that are usually invisible to legal scholarship and educational research. The clinic is not only a place where services are provided. It is also a space where participants are continuously trained — often implicitly — to become legal reasoners, care practitioners, digital coordinators and ethical decision-makers within a hostile institutional environment.

The central claim of this paper is that the clinic functions as a socio-legal pedagogical dispositif. Learning does not occur through formal curricula or stable professional hierarchies, but through sustained exposure to contradiction, vulnerability, urgency and infrastructural fragility. Building on Ruth Horowitz's work on learning through ambiguity,¹ Veena Das's conceptualisation of vulnerability as a moral and relational process,² and Bartha Knoppers' analysis of triage and

diagnostic reasoning in uncertain situations,³ this paper identifies four interconnected pedagogies produced by the clinic: ambiguity, vulnerability, triage, and digital infrastructure. These pedagogies are cumulative and co-constitutive, reinforcing one another as they shape how participants learn, make decisions, and act.⁴

This case study makes three contributions to pedagogical research. Firstly, it broadens the scope of learning beyond schools and professional institutions, demonstrating how complex competencies are cultivated in activist and humanitarian settings. Secondly, it redefines learning as not merely the acquisition of stable knowledge, but as the cultivation of ethical, diagnostic and relational capacities in situations of institutional instability. Thirdly, it foregrounds digital platforms, particularly WhatsApp, not merely as tools, but as pedagogical infrastructures through which legal, emotional and organisational knowledge circulates.⁵ By analysing how learning unfolds at the intersection of law, medicine, and activism, the paper suggests that the margins of institutions may now constitute some of the most significant sites for understanding how learning takes place at the beginning of the twenty-first century.

THEORETICAL AND METHODOLOGICAL FRAMEWORK

This research is grounded in long-term embedded ethnography and ethnographic study of practice.⁶ Between 2016 and 2024, I was continuously involved in a migrant legal aid clinic operating within a large activist association in France. My position evolved over time from volunteer to trainer of new volunteers, care referent (responsible for volunteer care and supervision), and eventually coordinator of the legal aid clinic. This longitudinal and insider position made it possible to observe not only the delivery of legal and medical support, but also the processes through which people learn to perform this work.⁷

Fieldwork included participant observation during weekly legal aid sessions, collective organisational meetings, and training activities for new volunteers. I accompanied migrants to prefectures, hospitals, and asylum courts, including OFPRA interviews and CNDA hearings. I participated in the drafting of asylum narratives, medical and legal attestations, and appeal documents. In addition, I systematically observed and archived digital interactions within the clinic, particularly through WhatsApp groups used for case coordination, supervision, and emotional support. The corpus therefore includes fieldnotes, digital message threads, images and documents produced during legal procedures, and institutional texts.

Methodologically, the analysis follows a grounded theory approach inspired by Strauss and Corbin,⁸ combined with Adele Clarke's situational analysis.⁹ This approach allows learning to be examined not only as an individual cognitive process, but as something produced within complex situations composed of people, rules, technologies, emotions, and institutional constraints. In this framework, WhatsApp threads, legal forms, medical certificates, waiting rooms, and protest spaces are treated as part of the learning environment rather than neutral or passive backdrops.

Three theoretical strands guide the analysis. First, Ruth Horowitz's concept of learning through ambiguity highlights how professional knowledge develops in contexts where rules are contradictory, unstable, or incomplete. Second, Veena Das's work on vulnerability frames learning as a moral and relational process, shaped by exposure to suffering, institutional violence, and the everyday work of repair. Third, Bartha Knoppers' work on triage and diagnostic reasoning provides a lens for understanding how participants learn to assess urgency, prioritise cases, and act with incomplete information under severe time pressure.

Together, these perspectives make it possible to conceptualise the legal aid clinic as a socio-legal pedagogical dispositif: a hybrid infrastructure in which law, care, activism, and digital coordination co-produce distinctive forms of learning. Rather than being taught in classrooms or formal training

programmes, participants acquire their competences through immersion in situations where ethical, legal, and organisational decisions must be made simultaneously and often under conditions of institutional breakdown.

The clinic does not apply pedagogical theory; it allows pedagogical knowledge to be articulated inductively from practice. Learning is conceptualised from situations of action, care, and coordination, rather than through predefined educational categories.

THE LEGAL AID CLINIC AS A PEDAGOGICAL SYSTEM

The clinic is a specialised “department” within a larger activist association, composed of volunteers trained in immigration and asylum law, interpreters, healthcare professionals, and legal advisors. Its core activity is the weekly legal aid session, where precarious migrants are received, listened to, and guided through asylum and regularisation procedures. These sessions include the registration of asylum claims, management of Dublin procedures, preparation for OFPRA interviews and CNDA appeals, medical regularisation, and emergency support.

Much of the clinic’s pedagogical work takes place outside these formal sessions. Asylum narratives are written in cafés, interview preparations occur in public gardens, and urgent legal decisions are made in hospital corridors or through smartphones. New volunteers observe how experienced members listen to fragmented stories, reconstruct timelines, and translate lived experience into legally recognisable narratives. Learning occurs through participation, imitation, and correction.

New volunteers enter a year-long mentoring process. They first observe consultations, then assist with note-taking and narrative drafting, and eventually conduct interviews under supervision. After each clinic, debriefings allow volunteers to discuss cases, question decisions, and receive feedback. Through this process, participants learn not only asylum law but also how to listen to trauma, detect inconsistencies without accusation, and protect both migrants and themselves.

WhatsApp is central to this pedagogical ecology. It functions as the clinic’s memory, coordination system, and informal classroom. Screenshots of legal decisions, voice messages from interpreters, and emotional reactions circulate continuously. When uncertainty arises, volunteers post in the group and receive guidance and corrections. Jurisprudence, procedural norms, and affective cues are learned through everyday digital interaction.

FOUR PEDAGOGIES IN PRACTICE

Learning through Ambiguity

Each legal aid session confronts participants with competing logics: legal, medical, activist, care-based, and digital. For example, during a consultation with a man subject to the Dublin Regulation, volunteers debated whether to prioritise a legal appeal or an emergency medical referral. Through these debates, new volunteers learn that professional judgement consists in navigating contradiction rather than applying fixed rules.

Legal aid work in the clinic unfolds in spaces marked by uncertainty. Asylum narratives are often constructed outside the formal setting of the clinic, in cafés, public gardens, or shared domestic spaces. Volunteers and migrants work side by side with notebooks and smartphones, interrupting the writing to clarify dates, reconsider formulations, or pause when emotions overwhelm the conversation. Legal categories such as persecution, credibility, or risk are not given in advance; they are negotiated through dialogue and hesitation.

In these situations, ambiguity becomes a central pedagogical condition. Volunteers quickly learn that asylum law does not provide stable interpretive frameworks. Legal rules change, institutional expectations remain opaque, and medical or social vulnerability rarely aligns neatly with juridical categories. New volunteers initially search for clear instructions—what must be included and what

should be avoided—but gradually learn that professional judgement consists in holding contradictory demands rather than resolving them. Through repeated exposure to such situations, participants learn to act without certainty, developing a form of practical reasoning grounded in negotiation and continual adjustment.

Vulnerability as Pedagogy

Participants learn to hear traumatic stories, reconstruct fragile narratives, detect distress, and hold ethical boundaries. Through shared debriefings and collective care, vulnerability becomes a medium of learning rather than a personal burden.

Moments of legal work are frequently intertwined with moments of care. Interpreters may translate asylum testimonies while holding young children, and interviews are often punctuated by visible signs of distress. Volunteers adapt the pace of questioning, shorten sessions, or suspend legal work altogether when emotional or physical vulnerability becomes overwhelming.

What is learned in these moments is not procedural competence but ethical attunement. Participants learn how to listen without extracting information at all costs, how to respect silence, and how to recognise when institutional requirements must be temporarily set aside to avoid harm. Vulnerability is not confined to migrants; it circulates across bodies and roles, affecting interpreters, volunteers, and coordinators alike. Through collective debriefings and shared reflection, participants learn to remain present in the face of suffering while maintaining ethical boundaries. Vulnerability thus becomes a *moral pedagogy*, shaping how people learn to care and act within violent institutional environments.

Triage and Diagnostic Reasoning

The clinic operates as a form of legal–health triage. Volunteers learn to assess urgency, identify inconsistencies, reconstruct timelines, and anticipate institutional risk, developing hybrid forms of legal and medical reasoning.

The clinic operates under conditions of constant urgency. During a single legal aid session, volunteers may need to prioritise an emergency shelter request, prepare an asylum appeal before a deadline, and respond to a sudden deterioration in someone’s health. Decisions must be made quickly, often with incomplete or contradictory information.

Participants learn to engage in a form of diagnostic reasoning that blends legal, medical, and organisational judgement. They reconstruct fragmented timelines, identify inconsistencies that may later be mobilised against applicants, and anticipate how administrative institutions are likely to interpret a case. Over time, volunteers describe learning to “think ahead of the institution,” anticipating rejection scenarios and adjusting strategies accordingly. This form of learning resembles professional triage, yet it takes place outside formal professional training structures. Through repeated exposure to high-stakes decision-making, participants acquire hybrid competences that allow them to navigate bureaucratic risk under pressure.

WhatsApp as Pedagogical Infrastructure

WhatsApp is not merely a tool; it is the clinic. Through message threads, screenshots, and voice notes, people learn jurisprudence, emotional cues, and organisational norms. Disagreements and micro-conflicts become moments of learning.

Even when the physical clinic is closed, legal aid work continues through digital communication. WhatsApp functions as a space where legal questions, emotional distress, and organisational coordination converge. Volunteers exchange screenshots of administrative decisions, voice messages conveying urgency, and brief updates on evolving situations. Responses often combine legal clarification, strategic advice, and emotional support.

Learning within this environment is distributed and continuous. New volunteers learn how to interpret institutional language, assess urgency, and frame responses by observing and participating in these exchanges. Knowledge circulates horizontally rather than hierarchically, and disagreements over legal strategy or ethical limits become moments of collective learning. WhatsApp thus operates not merely as a tool but as a pedagogical infrastructure through which legal reasoning, emotional regulation, and organisational memory are co-produced. Learning is embedded in the everyday rhythms and frictions of a fragile digital environment that remains indispensable to the clinic's functioning. Taken together, these four pedagogies provide the basis for rethinking learning beyond formal educational institutions.

DISCUSSION: RETHINKING PEDAGOGY FROM THE MARGINS

The migrant legal aid clinic examined in this paper challenges dominant pedagogical models that locate learning within formal institutions, stable curricula, and clearly defined professional roles. In contrast, learning in the clinic emerges through immersion in unstable situations where legal rules are shifting, institutional responses are unpredictable, and ethical stakes are high. Rather than being transmitted, knowledge is produced through action, hesitation, and collective adjustment.

First, this case invites a rethinking of learning as an outcome of exposure to uncertainty rather than mastery over it. Participants do not progress toward greater clarity or procedural certainty. Instead, they learn to operate within ambiguity, developing the capacity to make provisional decisions while remaining open to revision. This suggests that learning under conditions of institutional instability constitutes a distinct pedagogical regime, one that may be increasingly relevant in domains such as healthcare, social work, humanitarian aid, and migration governance. Second, the findings highlight the centrality of moral and relational learning. Much of what participants acquire cannot be reduced to technical competence. Learning involves becoming attuned to vulnerability, knowing when to pause, when to insist, and when to suspend institutional demands in order to prevent harm. These capacities are rarely recognised within formal training frameworks, yet they prove essential for practice in hostile institutional environments. Pedagogy, in this sense, concerns not only what people know, but how they learn to be affected and to respond ethically. Third, the clinic foregrounds the pedagogical role of digital infrastructures. WhatsApp is not an auxiliary support to learning but a constitutive environment in which legal reasoning, emotional regulation, and organisational memory are continuously produced. Learning unfolds through screenshots, voice notes, disagreements, and rapid exchanges, blurring distinctions between training, supervision, and peer support. This challenges conventional separations between online and offline learning and raises questions about the political and ethical implications of relying on commercial platforms for pedagogical work.

Finally, the activist origins of the clinic matter. Learning here is inseparable from collective responsibility and resistance to institutional violence. Participants learn not only how to navigate legal and medical systems, but how to act politically and ethically within them. This form of pedagogy, born in the margins of institutions, suggests that some of the most consequential learning today takes place precisely where formal education no longer reaches. This paper adopts an interstitial perspective on learning, focusing on a setting in which law, medicine, and public health intersect without any of these domains operating as a fully autonomous or dominant framework. Within this configuration, forms of knowledge, judgment, and responsibility emerge through practice, coordination, and response to institutional instability. Pedagogy can be understood less as a formalised project than as an effect of situated action. Participants learn by doing, by negotiating uncertainty, and by responding to gaps in institutional provision. In doing so, they contribute to shaping legal, medical, and social realities, often without these activities being recognised as educational.

This raises broader questions for pedagogical research. Rather than asking how such forms of learning might be integrated into existing educational institutions, this paper suggests the importance of first

documenting and recognising these sites of learning as such. Attending to these interstitial spaces makes it possible to better understand where and how learning takes place today, and which forms of knowledge remain invisible within dominant educational frameworks.

CONCLUSION

This paper has examined a migrant legal aid clinic in France as a pedagogical site where learning emerges at the intersection of law, medicine, and public health, shaped by activist engagement and digital infrastructure. Through long-term embedded ethnography, it has shown how participants acquire legal, ethical, and organisational competences not through formal training, but through sustained exposure to ambiguity, vulnerability, urgency, and infrastructural fragility. These pedagogies do not aim at mastery or certainty; they cultivate the capacity to act, decide, and care under conditions of institutional instability. Learning, in this context, is inseparable from ethical responsibility and collective coordination. At a time when professional and social worlds are increasingly marked by vulnerability, crises of meaning, and the erosion of institutional and relational continuities, the marginal pedagogies described here may no longer be peripheral. They offer critical insights into how learning unfolds when institutions weaken, rules become unstable, and sustaining ethical and relational ties becomes difficult. Understanding these forms of learning is therefore essential for rethinking what pedagogy means in the twenty-first century.

NOTES

- ¹ Ruth Horowitz, *Teen Mothers: Citizens or Dependents?* (Chicago: University of Chicago Press, 1995); Ruth Horowitz, "Learning through Ambiguity: Professional Socialization in Uncertain Contexts," *Journal of Contemporary Ethnography* 31, no. 3 (2002): 303–332.
- ² Veena Das, *Life and Words: Violence and the Descent into the Ordinary* (Berkeley: University of California Press, 2007); Veena Das, *Affliction: Health, Disease, Poverty* (New York: Fordham University Press, 2015).
- ³ Bartha Maria Knoppers, "From Diagnostic to Predictive Medicine: Ethical and Legal Challenges," *Nature Reviews Genetics* 2, no. 6 (2001): 437–443.
- ⁴ Jean Lave and Etienne Wenger, *Situated Learning: Legitimate Peripheral Participation* (Cambridge: Cambridge University Press, 1991).
- ⁵ Susan Leigh Star, "This Is Not a Boundary Object: Reflections on the Origin of a Concept," *Science, Technology, & Human Values* 35, no. 5 (2010): 601–617.
- ⁶ Paul Atkinson and Amanda Coffey, "Ethnography." In *Qualitative Research: Theory, Method and Practice*, edited by David Silverman (London: Sage, 2004), 121–139.
- ⁷ Paul Rock, "Symbolic Interactionism and Ethnography." In *Handbook of Ethnography*, edited by Paul Atkinson and Amanda Coffey (London: Sage, 2001), 26–38.
- ⁸ Anselm Strauss and Juliet Corbin, *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, 2nd ed. (Thousand Oaks, CA: Sage, 1998).
- ⁹ Adele E. Clarke, *Situational Analysis: Grounded Theory after the Postmodern Turn* (Thousand Oaks, CA: Sage, 2005).

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TRANSFORMING THE EVALUATION ENCOUNTER INTO A SITE ALONG THE LEARNING JOURNEY: A CARTOGRAPHIC TURN IN L2 DOING & LEARNING

Authors:

BRENDON CLARK, MAGDA VANMONTFORT

Affiliations:

UMEÅ UNIVERSITY, SWEDEN. SUPPORT CENTER OF EDUCATION, BELGIUM

INTRODUCTION

Entering the discussion about how to best support adult immigrants living in a country to participate in the public and private services and opportunities of a democratic society, raises questions about the organization of language teaching and learning, and the relationship between what happens inside the classroom setting and outside the walls of the classroom. Not only what is the content that moves across the classroom walls, but what are the interactive practices that make the content available? We propose a cartographic assessment practice that materializes learners' spatiotemporal orientations and aspirations in interaction, enabling formative assessment to function as a waystation along the learning journey rather than a terminal summative checkpoint.

Language learning in-the-wild

We draw on Conversation Analysis Second Language Acquisition (CA-SLA) research that demonstrates how language learning does and can take place through interactions “in-the-wild” of everyday life, mainly through explorations with adults in higher education. Rather than view language as a system to be learned cognitively, CA-SLA brings focus to the situated interaction between people and objects,¹ contributing perspectives on usage-based linguistics, and building interactional competence, the movement across interactional contexts and the participation frameworks learners engage in.² Interactional competence is the ability by participants draw on linguistic, prosodic, and embodied interactional resources to accomplish social actions within recurring contexts of interaction.³ Similarly, usage-based linguistic approaches view second-language development as emerging from learners' repeated, embodied, and socially situated use of linguistic resources in interaction.⁴ To purposefully support this type of learning, design experiments and provocations have focused on both supporting and studying learning beyond the classroom. Across design-based research, CA-SLA, and design anthropology, such interventions are viewed not as instructional techniques but as situated provocations that reorganize participation and make learning relevant, visible, and consequential in everyday life.⁵ Rather than transferring linguistic knowledge, these approaches focus on designing the conditions in which learners are encouraged to act, negotiate meaning, and reflect on experience, allowing learning to emerge through use and interaction. “This entails frequent and rich participation in the second language life-worlds into which a newcomer ‘bricolages’ his or her way.”⁶

Drawing on these traditions, this paper examines how classroom-based practices can be reconfigured to support learners in drawing on, and extending, their experiences of language use in everyday life. The focus is on transformations in L2 classroom arrangements, specifically, shifts in teacher and student roles, as well as in spatial, material, and temporal organization, that allow classroom activity to be more “receptive to”, and “generative of”, interactions beyond the classroom setting. The analysis is grounded in activities from a newly developed course, referred to here as “Gateway”, with particular attention to how the use of a non-geographical map and the organization of interaction around it, can contribute to such transformations.

Methodological considerations

Our project approach draws on design as a form of inquiry in traditions of design anthropology, combined with educational psychology. Empirically, the paper is grounded in activities in Belgium and Sweden (2024–2025) within a project where teachers and their students, civil servants, and design researchers collaboratively develop forms of language teaching oriented toward everyday interactions beyond the classroom. The material selected here comes from a school serving “shortly educated adult immigrants,” including recent refugees from Ukraine and Afghanistan as well as longer-settled residents of Belgium. The material was generated through five teacher workshops, six lesson visits, and three semi-structured interviews, documented with notes, videos, photographs, maps, and transcriptions, all in relation to the Gateway course and the development and use of an “assessment tool”. The material has been analysed in monthly research meetings to both inform subsequent activities, and to record for further analysis.

The assessment sequence we describe below involved twelve students, five teachers, and three volunteers in the Gateway course. As a means for accounting for the situated and interactive nature of classroom-based interactions, we create a frame around the “evaluation encounter”. In line with Salaberry et al.,⁷ we see assessment as a situated practice for eliciting observable evidence of language ability from evaluation as a broader type of ethical and normative judgment about the value, consequences, and justification of such practices. We draw recent work from the Vygotskian tradition of sociocultural theory framed as “dynamic assessment”⁸ to account for the dialogic nature of the evaluation encounter, bringing focus to the emergent and contingent nature of mediation, how learners can develop with different types of support, and the modifiability available within the encounter. Additionally, we align with assessment researchers’ concerns with the abilities of language learners to re-apply what they have learned in non-assessment contexts,⁹ focusing on the dynamic relationship between the examiner and the examinee(s). This brings focus to how they align their focus to a common goal, attributing meaning to the assessment task, and looking for ways to transcend a current learning situation.¹⁰

THE LEARNING ARRANGEMENT

We will take a slice of two very different types of evaluative encounters from two courses taught by the same teacher-mediated classroom setting: a CEFR-based test guided by an evaluation protocol with the testable content (pre-structured individual test), and the new Gateway course assessment tool, guided by a map and tokens. In the latter, the teacher’s intent to create a future-oriented evaluation tool for the Gateway course resulted in a paper-based “map” with movable tokens, embedded within a sequence of teacher-initiated activities, for students to represent their out-of-classroom lives (cooperative assessment).

Pre-structured individual test

In the pre-structured evaluation, as seen in Figure 1, the desks are arranged in a U-shape with students seated along the outside and the teacher positioned at the open end. Students are called forward by the teacher one at a time for a brief one-on-one assessment, sitting opposite the teacher while their peers continue studying, often within earshot.



Figure 1. Pre-structured individual test classroom on left and the cooperative assessment on right.

The test is guided by a protocol that functions as both the teacher's script and evaluation criteria, organized around content, form, vocabulary, pronunciation and intonation, and confidence in speaking. Assessment focuses on a student's ability to independently perform a fixed dialogue consisting of twelve utterances, six by the teacher-examiner and six by the student, of which at least five student responses must be correct. Points are awarded for specific informational elements. For example, making a restaurant reservation over the phone, gives points for stating the purpose of a restaurant reservation, and the number of people, with bonus points given for "confidence", "extra vocabulary", and "pronunciation and intonation" as judged by the teacher.

Preparation takes place over three three-hour classes in the preceding weeks, during which the teacher introduces model dialogue and students practice the dialogue using images, audio recordings, discussion, and paired role-play. While the dialogues are pre-determined and domain-specific, teachers may adjust them to fit students' life situations, such as excluding child-related content for students without children.

Gateway course - cooperative assessment

In the Gateway course the assessment is organized around a shared table with the central artifacts poster-sized map, see Figure 2, paper tokens, see Figure 3, Post-it notes, and pens. One student presents at a time while peers, teachers, and volunteers gather around the table, with options to ask questions and comments, before moving collectively to the next room for the following presentation.

Phase	Activity	Description
1a. Circle Discussion	Whole class map and token introduction	Students, teachers, and volunteers sit in a circle with the map and tokens in the center. The teacher introduces materials and invites students to share experiences, linking stories to pictograms and using tokens to explore situations, emotions, and needs.
1b. Small-group Work	Group exploration	Students work in small groups with maps and cards, reflecting individually before sharing. Teachers circulate, ask questions, and reinforce vocabulary.
1c. Whole-class Sharing	Collective reflection	Groups reconvene to share insights. Students recount experiences and reflect on actions and feelings, enabling collaborative discussion.
2. Student–Speaker Pairs	Mapping dialogue	One student works with a teacher or volunteer using the map, tokens, and Post-it notes to discuss real-life experiences and future plans while constructing their map.
2b. Video Performance	Recorded narration	The student presents their map while the teacher or volunteer records the narration on a mobile phone video.
3. Class Presentations	Whole class engagement	The class moves from room to room to listen to presentations. Teachers and peers ask clarifying questions, offer comments, and give advice.

Table 1. Cooperative assessment process.

Map and token use – Candice journey

In the following section, we draw on excerpts from Candice, a student, moving through the assessment process with a Dutch speaking volunteer, Jutta. The material is drawn from Jutta’s field notes and a video recording.

Student–Speaker Pairs – Individual Exploration

In the paired activity with Jutta, Candice explored the map tentatively and expansively. Her talk moved back and forth between past constraints, present feelings, and future possibilities.

Sitting side by side at the table alone in a room, Candice and Jutta use the map and materials on the table as cues for Candice to talk about aspects of her everyday life. She begins with her family and neighborhood, drawing herself and her children on Post-It notes, and placing them in the house at the center of the map. She describes the polite but distant relations with her neighbors. She adds a future token, stating her desire to speak with them more, imagining small gestures such as sharing food. Looking at the medical icon, Candice recounts visiting the doctor on her own for the first time, after years of medical issues and reliance on her daughter for translation. She marks this moment as now and without help, expressing pride and relief that based on her daughter’s urging, she now visits without using her daughter as a translator. At the same time, she formulates a future wish to speak in “nice sentences” during medical visits, linking language learning to greater independence and confidence in everyday interactions.

Candice scans the map, points to Work, and explains that her in-laws discouraged her from working or taking language courses, despite her teachers’ encouragement. She places a sad-face card and a group card to mark their resistance, then tells Jutta she now feels too old to seek a job. When she mentions she is 44, Jutta replies that many people, including herself, are still learning and developing new skills, they laugh and joke about their age. Pointing to the school, Candice says that with her children grow up, she intends to take extra courses, placing a future card and adding that she wants to

“make nice sentences.” Jutta asks if she should write that down, Candice agrees and asks Jutta to draw a computer, explaining she wants to start a computer course because it is essential for further learning. Candice adds that she enjoys school for meeting others and places a smiley with now and help, noting she still needs support and sometimes uses her phone for translation. She asks Jutta to write the names of her language teachers on a Post-it “because they are good teachers,” placing it near the school. At the job-agency pictogram, she adds *future* and asks Jutta to write training on a Post-it, explaining that Dutch and computer skills are required before vocational training.



Figure 4. Candice's map after her dialogue with Jutta.

Video Performance

After the talk, Jutta asks Candice if she would like to record a video of her map, while pointing at the different places, and explain what she wants to share about her story, knowing that this is the final step of this cooperative assignment. At first Candice is reluctant, stating that she is a bit nervous. Jutta gets the impression that, in contrast with the more informal talk that came before, this is a formal moment for Candice. In presenting, Candice speaks about some of the places on the map they have previously spoken about and not others, describing her family and her visits to the hospital, that she likes to go to the language school, that she wants to take computer lessons and vocational training and look for a job afterwards. She elaborates on the resistances of her in-laws and her regrets, and talks about her hobbies and her shopping experiences.

Class Presentation

When the others come into the room for the final presentation, Candice presents her map and her story to the other students, teachers and volunteers. During this presentation, she announces that she is going to apply for vocational training to be a cook. She also stresses that she wants to talk more with her neighbors. When the teacher subsequently asks her if she wants to be able to cook for family and friends, she exclaims with much enthusiasm and a big smile that she wants to become a professional cook, working in a restaurant or a big kitchen. She is laughing out loud, while the other students are encouraging her, laughing too. While they are discussing her plans, the teacher turns to Jutta and whispers “That is why I love my job. This is what I am doing it for.”

Transformations Across the Three Activities

From exploratory mapping, scripted narration, to public aspiration

Using a non-geographic map of everyday domains, the case illustrates how students co-construct their stories through the semi-structured use of the map, movable tokens, notes, and talk. In Candice's case, these same materials take on different roles across participation arrangements. During the paired exploration, she and the volunteer jointly build content onto the map, reflecting openly on past experiences and future desires. In the subsequent video performance, she sequences selected elements into a coherent self-narration anchored by the assembled map, acting as a script. In the final class presentation, this narration becomes a platform for trying out a new position, seen in her shift from describing herself as "too old for work" to publicly declaring an intention to become a "chef."

This progression suggests that repeated engagement with the map in different constellations supports provisional shifts in self-perception and future orientation, even though the analysis does not track changes in specific linguistic forms. What becomes visible instead is how physical, material, and embodied resources mediate reflection, aspiration, and the articulation of future action. In contrast to the pre-structured evaluation encounter that assesses correct linguistic performance, Candice expressed her wish to "make nice sentences," her pride in attending a health appointment without her daughter for translating, and her desire to no longer rely on her phone for translation, demonstrating her aspirations for greater independence in everyday interaction.

Visible, tangible, embodied interaction

The "pointability", specificity, and modifiability of the mapping practice make experiences and imagined futures visually and materially graspable. The movable tokens orient reflection temporally, emotionally, and socially. The *now* and *future*, smiley and sad, and group, help, and alone tokens draw attention to emotions and to who was, could, or should be involved.

Framed through dynamic assessment, the sequence demonstrates reciprocity between teacher and volunteer questioning, and student elaboration, the individual meaningfulness in the student's selection of situations, and transcendence, the linking of the activity in the present to past experiences and imagined future situations.¹¹ There is also a spatial dimension to each situation. From a spatial temporal deixis perspective,¹² the "deictic center" of the learner in each situation anchors temporal, locational, and situational references in the physical present.

Although cartography has rarely been theorized in second language learning, work across CA-SLA and design anthropology treats mapping as a means of organizing experience, tracing participation across places, and supporting learning in everyday life. In design, materializing experience is a strategy for making tacit knowledge explicit for shared collaborative meaning making. Wagner conceptualizes second language learning as movement across interactional sites and participation frameworks that extend beyond the classroom into everyday spaces, supported by designed infrastructures¹³. The cartographic practices here demonstrate a type of "relational transposition" of orientation across situations, experiences from elsewhere are brought provisionally into the classroom for joint reflection and are then projected outward as potential actions. At the same time, the learner is rehearsing forms of interaction that combine talk with embodied, material, interactions.

CONCLUSION

This paper has argued that the evaluation encounter can be re-made as a site along the learning journey rather than a terminal checkpoint. By introducing a cartographic practice, a non-geographic map with movable tokens, within a cooperative assessment sequence, we showed how learners and educators can materialize experience, re-orient participation, and project futures in ways that are difficult to achieve through pre-structured, dialogue-based testing alone. The Candice sequence makes

visible a progression from exploratory mapping, through scripted narration, to public aspiration, where her claims about self are not merely reported, but co-constructed in interaction with teachers, volunteers and classmates.

Transforming the evaluation encounter into a waystation on the learning journey is less about loosening standards than about re-standardizing what counts as evidence, not only correct utterances under ideal conditions, but co-constructed action, orientation, and projection under real ones. A cartographic turn in L2 doing and learning makes these orientations tangible and negotiable, enabling even “shortly educated” adult learners, and educators to see, name, and pursue the next steps of participation, together.

NOTES

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- ² Johannes Wagner. "Designing for Language Learning in the Wild: Creating Social Infrastructures for Second Language Learning." *Usage-Based Perspectives on Second Language Learning*, December 1, 2015, 75–102.
- ³ Richard F. Young and Eli Hinkel, "Interactional Competence in Language Learning, Teaching, and Testing," in *Handbook of Research in Second Language Teaching and Learning*, ed. Eli Hinkel (Abingdon: Routledge, 2011) <https://doi.org/10.4324/9780203836507.ch26>.
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- ⁷ Maximo Salaberry, Albert Weideman, and Wei-Li Hsu. *Ethics And Context In Second Language Testing*. 2023.
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EXPLORING THE ROLE OF GENERATIVE AI IN CREATING AN INCLUSIVE BUSINESS CURRICULUM THROUGH STAFF DEVELOPMENT AND COLLABORATION

Author:

CHRISTINE O'LEARY, GEORGINA MURRAY, JAYNE REVILL, ZOE NEWSHAM

Affiliation:

SHEFFIELD HALLAM UNIVERSITY, UNITED KINGDOM

INTRODUCTION

The concept of inclusivity within a higher education context stemmed from the need to support government agendas relating to widening participation and disability equality.¹ Concerns over the sector-wide ethnic-minoritised and other disadvantaged groups of students' attainment, have led to calls for a more inclusive approach to curriculum design.²

The growth in generative artificial intelligence (GenAI) software such as Chat-Generative Pre-Trained-Transformers (ChatGPT) has challenged traditional methods of assessment,³ whilst offering opportunities for a more inclusive approach to curriculum delivery.

Researchers emphasise the need for the introduction of GenAI into university assessment.⁴ However, this implementation requires careful consideration of appropriate training, academic integrity, and student support mechanisms. This project explores how GenAI might be harnessed to create a more inclusive curriculum, including assessment, within a large business school, through staff development and collaboration.

LITERATURE REVIEW

The arrival of Generative Artificial Intelligence (GenAI), demonstrated by tools such as ChatGPT, has caused a need for rapid shift across the Higher Education (HE) sector. Described as "Generative AI's breakout year" in 2023,⁵ its adoption is widely regarded as irreversible, requiring an institutional response to develop 'future-facing curricula'.⁶ This literature review supports the core purpose of the proposed research project, which seeks to explore how GenAI can be connected to create a more inclusive curriculum through staff development and collaboration within the Sheffield Business School (SBS).

Despite the widespread recognition of GenAI's potential for enhancing teaching, learning, and assessment, HE institutions face significant challenges related to academic integrity, ethical use, and staff preparedness. Research underscores the immediate need for this project's focus on policy, guidance, and training, this includes areas such as:

Misuse and integrity concerns

A majority of respondents across the academic community believe AI is being misused. 95% of survey participants (students, educators, and academic administrators) think AI is currently being misused in some capacity at their institution,⁷ and 57% report that AI poses a threat to academic integrity.⁸ Students themselves are more likely to consider the use of AI to write an entire piece of work cheating (63%) compared to educators (55%) and academic administrators (45%).⁹

The knowledge and support deficit

Academic staff feel ill-equipped to effectively integrate AI. 47% of educators and academic administrators state they would like to leverage AI to make better decisions for teaching but "don't necessarily know how".¹⁰ Furthermore, 50% of educators and 41% of academic administrators are worried about the use of AI within education.¹¹ This suggests a substantial intention-behaviour gap, where staff struggle with implementation due to a lack of clear frameworks and policies.¹²

Students need for guidance

In a recent survey from Turnitin and Vanson Bourne, students, who report higher concern (64%) about AI use than staff,¹³ are actively seeking direction. Half (50%) of students report that they do not know how to get the most benefit out of AI in their studies.¹⁴ These statistics suggest the research premise that a systematic exploration of staff development needs and current use is essential to inform the design of a necessary Continuing Professional Development (CPD) Programme.

Academic integrity, ethics and equity

GenAI directly challenges traditional assessment practices.¹⁵ Concerns about academic integrity, notably cheating and plagiarism, are paramount. The capability of GenAI tools to generate passable, human-like responses requires Higher Education Institutions (HEIs) to re-evaluate traditional assessment methods to maintain academic standards.¹⁶ This over time has often left even experienced markers struggling to consistently differentiate between student-written work and text generated by large language models.¹⁷

The literature strongly suggests a shift towards authentic assessment and assessment focused on the process not the product. This involves leading students through the creation process, having them log search strategies and keywords, and critically evaluate the validity of content, including AI-generated text.¹⁸ However, the ethical pitfalls of GenAI must be addressed, which constitutes a core theme of the project. Ethical considerations, including data privacy, algorithmic bias, and lack of transparency, are significant concerns.¹⁹

Digital inequity is a concern, as sophisticated AI functions often sit behind paywalls.²⁰ Research indicates that AI detection tools can be biased against non-native English writers,²¹ potentially leading to false accusations of misconduct.²² However, research conducted by Bedford et al. does show signs of movement in this space, reporting that GenAI can also offer opportunities to support diverse learners; for instance, responsible GenAI use can enhance autonomous learning and boost confidence for English as Additional Language (EAL) students.²³

Institutions have a responsibility to address ethical issues and critical digital literacies.²⁴ The necessity of clear guidance, policies, and training to address these issues is frequently underscored.²⁵ This should also support institutions on creating an inclusive curriculum addresses wider HE responsibilities regarding widening participation²⁶ and addressing attainment gaps among disadvantaged student groups.²⁷

The literature identifies the need for targeted and detailed professional development to address the barriers to GenAI integration.²⁸ Successful adoption requires training that extends beyond technical

skills to support embedding ethical frameworks, design, critical pedagogical development, and bias detection.²⁹ Institutional support requirements are extensive, including standardised guidelines, clear policies, and the establishment of communities of practice.³⁰

METHODOLOGY

The study is based in one of the UK's largest Business Schools offering full-time and part-time undergraduate and postgraduate studies, and Higher Degree apprenticeships to approximately 5,000 students.

It aims to address the following questions:

1. What are the key areas to consider when integrating GenAI into the curriculum, including assessment?
2. How is GenAI integrated in the curriculum within the different Business School disciplines and what have been the benefits to date?
3. What are the perceived staff development needs?
4. What are the implications for designing a CPD Programme to integrate GenAI across Sheffield Business School (SBS) and beyond?
5. What is the impact of implementing such a programme across SBS?

This study adopts a mixed-method pragmatic research design, as it seeks to develop a practical and context-specific response to the challenges and opportunities presented by Generative Artificial Intelligence (GenAI) within the Business School. A pragmatic approach was judged appropriate because it focuses on identifying workable solutions to real institutional needs, prioritising methods that best address the research questions rather than aligning with a single epistemological position. Pragmatism also supports methodological flexibility, enabling the combination of quantitative and qualitative data to produce both breadth and depth of understanding.³¹

Drawing from this pragmatic orientation, the study integrates a narrative literature review, survey research, and case study evidence to identify key considerations for integrating GenAI into curriculum and assessment, and to inform the design of a staff development programme.

Narrative literature

The study begins with a narrative literature review, following the iterative, interpretive process described by Juntunen and Lehenkari, who characterise such reviews as involving “an intertwined combination of searching, evaluating, selecting, pre-analysing and reading the literature” in a non-linear and recursive manner.³² This form of review is particularly appropriate in emerging fields such as GenAI in higher education, where conceptual boundaries, pedagogic implications, and institutional responses continue to evolve.

The literature review focuses on identifying key themes relevant to curriculum integration, including ethical considerations, assessment design, academic integrity, disciplinary differences, and staff development needs. It also incorporates internal and external case studies of practice, allowing the project to generate an initial set of protocols for integrating GenAI into the curriculum, which are later compared with empirical findings from the staff survey.

Survey of academic staff

To complement and extend the insights generated through the literature review, the study surveys approximately 500 academic staff within the Business School, resulting in 48 responses. The aim is to gauge current uses of GenAI, perceived benefits and challenges, areas for development, and disciplinary approaches to integration. The survey contains a mixture of closed Likert-scale questions and open-ended qualitative questions, allowing for the collection of both quantitative and qualitative

data. This design aligns with the mixed-method pragmatic approach, ensuring that the survey can capture large-scale patterns while also providing space for staff to elaborate on individual experiences and needs.

Data analysis

Quantitative data from the survey are analysed using descriptive statistics, including frequencies, means, and percentages. These analyses identify broad trends across the school, highlight areas of variability between disciplines, and reveal staff confidence and engagement levels.

Qualitative data from open-ended questions are analysed using thematic analysis, enabling the identification of recurring concepts, concerns, and examples of practice. Themes are generated through systematic coding and iterative refinement, allowing the analysis to reflect the diversity of staff perspectives while identifying common developmental priorities.³³ Findings from both strands of analysis are then compared with the literature-derived protocols to validate, refine, and extend the emerging framework for integrating GenAI into teaching, learning, and assessment.

Design of the Staff Development Programme

Drawing from the literature review, internal/external case studies, and the staff survey findings, the project findings feed into a Continuing Professional Development (CPD) Programme. This programme will be designed to support academic staff in integrating GenAI effectively and ethically into their curriculum. The impact of the CPD Programme will also be evaluated through a short participant survey. This focuses on the preliminary empirical findings based on survey to inform the staff development programme.

Ethical considerations

The study seeks ethical approval from the University prior to data collection. All participants receive clear information about the project's purpose, and a consent statement is embedded within the survey to ensure voluntary participation in accordance with the University's Ethics Code of Practice. All data are anonymised during analysis, stored securely on the University server, and retained for a maximum of six months after the project's completion.

FINDINGS AND DISCUSSION

This section integrates quantitative and qualitative survey findings to examine academic staff engagement with Generative Artificial Intelligence (GenAI), explicitly linking results to the literature. Overall, adoption is emerging but uneven, shaped by pragmatic use, confidence gaps, and ongoing concerns regarding academic integrity, ethics, assessment design, and institutional support.

Extent and nature of GenAI use

Quantitative data show that fewer than half of respondents (47.9%) currently use GenAI in teaching, which aligns with literature describing adoption in Higher Education as fragmented and largely driven by individual experimentation rather than institutional strategy.³⁴ While 75% of respondents are open to future use, 24.1% reported no intention to adopt GenAI in the next delivery period, indicating some resistance and uncertainty.³⁵ This reflects the "intention-behaviour gap" identified in the literature, where staff express interest in AI but hesitate to integrate it fully without guidance or confidence in its ethical and pedagogical application.³⁶

Qualitative analysis revealed four dominant themes in current use: efficiency and timesaving, resource and content generation, student engagement, and development of critical and digital skills. Respondents reported using GenAI to support lesson planning, summarisation, and assessment

preparation, noting significant time savings. Some reported that AI “saved about two hours of writing and editing” or enabled them to “do more for the benefit of the students in less time.” This mirrors literature emphasising that GenAI can alleviate workload pressures while providing space for more student-focused teaching.³⁷

Staff also used GenAI to generate bespoke teaching materials, including case studies, scenarios, quizzes, and lecture content. Participants highlighted the ability to rapidly produce materials that would otherwise be time-consuming, echoing research on AI’s role in enhancing curriculum responsiveness and pedagogical flexibility.³⁸ This suggests that staff value AI not only as a productivity tool but also as a means of tailoring learning experiences to diverse student needs.

Student engagement and development of critical skills

Both quantitative and qualitative findings indicate purposeful use of GenAI to enhance student engagement. Staff reported creating interactive activities such as quizzes, role-play scripts, and icebreaker exercises, perceived to improve understanding of key concepts. This aligns with literature advocating GenAI as a tool to support active learning and student participation.³⁹

Several respondents described using GenAI pedagogically to develop critical thinking skills, such as comparing their own work with AI-generated outputs. This mirrors literature highlighting the potential for AI to encourage reflection, critical evaluation, and awareness of the limitations of AI-generated content.⁴⁰ However, such practices were not widespread, suggesting that more structured CPD and guidance may be needed to embed critical skills development across the curriculum.⁴¹

Confidence and advising students

Quantitative findings show moderate confidence in using GenAI, with 39.6% reporting they are fairly confident. Confidence decreased when advising students, with only 29% confident and 25% lacking confidence. This aligns with literature noting staff uncertainty when supporting students and managing assessment integrity in the context of GenAI.⁴²

Qualitative data reinforce this, with participants reporting uncertainty about what constitutes appropriate use, how to support students without fostering dependency, and how to ensure fair assessment. These findings reflect literature highlighting that a lack of structured guidance and training limits staff capability, even among those willing to experiment with AI tools.⁴³

Academic integrity, ethics, and assessment

Concerns about academic integrity were the most frequently cited support need (79.2%), followed by ethics (56.3%). These concerns mirror literature describing the challenges GenAI poses to traditional assessment, including the risk of plagiarism and disguised AI-generated work.⁴⁴

Qualitative responses highlighted staff worries that AI enables students to conceal GenAI-generated work, particularly in coursework assessments. Many staff reported low confidence in detecting such outputs, consistent with research demonstrating the difficulty of distinguishing AI- from human-authored text.⁴⁵ Ethical resistance was also evident, with participants citing concerns about meritocracy, authenticity, and data privacy.⁴⁶ Existing assessment formats were considered increasingly vulnerable, reinforcing literature advocating process-focused approaches that emphasise the creation process rather than the final product.⁴⁷

Equity and inclusion

Equity concerns appeared in qualitative responses, with participants noting that GenAI may advantage stronger students and exacerbate attainment gaps, consistent with literature cautioning against assuming AI is inherently inclusive.⁴⁸ While literature highlights potential benefits for EAL

students,⁴⁹ this was less evident in staff perceptions, suggesting a need for targeted professional development to embed inclusive practices and to ensure that all students benefit from AI tools equitably.⁵⁰

Support requirements and institutional role

Quantitative data indicate strong demand for guidance on referencing AI (62.5%), ethics (56.3%), and practical “how-to” support (50%). Qualitative findings reinforce the need for clear, consistent institutional policies to reduce ambiguity and ensure fairness in assessment.⁵¹ Staff emphasised the importance of academic integrity processes, structured ethical guidance, and training to build pedagogical confidence. Literature supports coordinated institutional approaches, standardised policies, and professional development extending beyond technical skills to include ethics, assessment redesign, and inclusive curriculum design.⁵² Access to endorsed AI tools was also highlighted as necessary, reflecting concerns about digital inequity.⁵³

FRAMEWORK FOR CPD DESIGN

Based on both the narrative literature review and empirical survey data, the following pragmatic framework is designed to bridge the ‘intention-behaviour gap’ and inform an effective staff development programme. While 75% of staff are open to using GenAI, a significant ‘knowledge deficit’ persists, with 47% of educators expressing a desire to leverage the technology but admitting they ‘don’t necessarily know how’. This framework addresses the demand for guidance on areas such as academic integrity (79.2%) and AI referencing (62.5%) by shifting the focus from product-focused to process-based assessment. By integrating staff needs for practical ‘how-to’ support with literature-lead ethical safeguards, the CPD programme will provide a structured pathway to move from fragmented, individual experimentation toward a systematic and inclusive institutional strategy (Table 1).

CPD Protocol	Staff Needs (Survey Findings)	Conceptual Framework (Literature)
1. Ethical Integrity and Referencing	High demands for referencing guidance and ethics. Focus on identifying misuse, as opposed to use of GenAI tools.	Academic integrity needs to move beyond imperfect detection tools to establish clear ethical boundaries and transparent use.
2. Process-based pedagogy	Desire to use GenAI for resource generation and timesaving.	Authentic assessment can mean a focus on the creation process, requiring search logs and critical evaluation of AI outputs.
3. Inclusive practice and equity	Need for targeted development to support EAL students and close attainment gaps.	Digital inequity and challenging this mean mitigating the impact of paywalls and leveraging AI as an autonomous learning confidence-booster.
4. Practical capability and strategy	Addressing the 25% of staff who lack confidence in advising students and a need for practical ‘how-to training’.	Establishing Communities of Practice and standardised guidelines to ensure cross-disciplinary fairness.

Table 1. CPD Design Protocol for GenAI Integration

CONCLUSION

This research provides a pragmatic conceptual framework for integrating Generative AI (GenAI) into the Business School curriculum (Table 1). By bringing together the narrative literature review with the staff survey data, the study has established protocols focused on academic integrity, ethical use, and inclusive pedagogy.

Findings indicate that while current integration is fragmented, there are significant benefits, including pedagogical efficiency and the rapid generation of bespoke teaching materials. To address the research questions regarding curriculum integration, this study advocates for the shift towards authentic, process-based assessment to maintain academic standards.

The identified staff development needs, specifically regarding AI referencing, ethical frameworks, and confidence in advising students, will inform the design of a targeted CPD programme. Key elements for this design include building communities of practice and providing standardised institutional guidelines to bridge the ‘intention-behavior gap’. Positive research elements highlight GenAI’s potential to enhance active learning and critical thinking. However, further development is required to address bias detection and to better support English as Additional Language (EAL) students.

Further research could focus on evaluating the long-term impact of the CPD Programme on staff practice and student attainment. Additionally, given the rapid evolution of the field, a continued evaluation of current literature is essential to ensure a future facing and inclusive curriculum.

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STUDIO-BASED LEARNING AND THE FUTURE OF HIGHER EDUCATION

Author:

TARA WINTERS

Affiliation:

THE UNIVERSITY OF AUCKLAND, WAIPAPA TAUMATA RAU, NEW ZEALAND

INTRODUCTION

Higher education is in a moment of pivotal change, as diverse forms of innovation and disruption combine to create new possibilities.¹ Today's students have grown up within deeply digital environments, shaping ways of thinking, relating, and learning that were not reflected in traditional teaching practices less than a decade ago. More recently, the proliferation of AI-generated information outputs has foregrounded these digitally formed ways of engaging with the world. As students and staff navigate increasingly flexible and mobile lives, the notion of a fixed learning environment is evolving into a more fluid and process-oriented engagement with creative and critical thinking. Learning unfolds across diverse contexts - on the bus, at the kitchen table, around family and work commitments; within shared, distributed physical and digital environments. This shift challenges educators and students to rethink how learning is facilitated and the diverse contexts in which it meaningfully occurs.

Contemporary higher education research increasingly understands learning as process based and relational, in which knowledge and identity are shaped through sustained participation, dialogue, and feedback. A student's sense of belonging arises from these practices and is strongly linked to engagement, wellbeing, and retention.² Studio learning foregrounds process, participation, feedback, and relational engagement in ways that are increasingly recognised as essential across disciplines.

Studio-based learning (SBL), a signature pedagogy in the creative arts, has long placed process and a sense of belonging at the heart of teaching and learning. Process refers to the unfolding, exploratory, iterative and reflective activities through which ideas are generated and work is developed. SBL in art and design reflects and models how artists think. This involves staying with the anxieties and uncertainties of the creative process and being comfortable with the ambiguity of not knowing, aspects of student development that are rarely theorised or addressed despite being an essential aspect of pedagogy.³ Rather than being a linear path toward a predetermined result, process in creative arts subjects is generative, provisional, and open-ended. Art and design higher education addresses many of the social mechanisms through which belonging is constructed - identity formation, participation in studio cultures, shared studio norms, informal feedback, and peer learning. Undergraduate art and design education can be understood as a process of identity transformation, through which students become creative practitioners and come to feel a sense of belonging to the discipline and its community of practice.⁴

This essay explores post-pandemic studio-based teaching practices and considers their implications for the future of higher education. It focuses on a piece of research with creative arts academics that

explored how the disruption of COVID-19 reshaped studio-based teaching and catalysed new thinking, providing evidence-informed reflections on future practice. We asked how digital modes might change and extend studio pedagogy, responding to shifting student behaviour and increasingly digital lives.

STUDIO PEDAGOGY

Studio teaching in the creative arts is a hands-on, project-based learning approach centered in interaction-based activities. It emphasises learning through doing, experimentation, and critique. ‘The studio’ refers to a physical and social setting, and a pedagogy. Studio pedagogy is valued for its implicit relationship with creativity, with forms of understanding that depart from habitual ways of looking at things and for the way studio inquiry cuts across disciplinary understandings to discover new connections and reveal the significance of relationships. Traditionally rooted in creative arts and architecture, studio based learning is increasingly being explored as a model for other domains of higher education learning.

Studio pedagogy may be well suited to this future because it treats learning as iterative, uncertain, socially mediated, and practice-based, rather than linear and content-transmission focused. Jarni & Gurr explicitly argue that future higher education must move beyond stable content delivery toward pedagogies that can respond to uncertainty, AI, and rapid change. They identify studio-like practices (authentic projects, dialogic feedback, student agency) as exemplars of “next practice”.⁵ In an uncertain world content knowledge alone becomes outdated quickly; what endures is the ability to inquire, iterate, reflect, adapt, critique, integrate knowledge from many sources and work collaboratively.

While the value of its active-learning pedagogy is being more widely acknowledged across the university, ‘the studio’ remains routinely under-examined and under-theorised as an educational practice in higher education. The challenges brought about by the COVID-19 pandemic provided a catalyst for fresh critical examination of studio-education practices. In our study, several interconnected themes emerged, most notably the growing importance of flexibility in learning, the use of technology to support and enhance learning, shifting student expectations, and evolving teaching mindsets.

Enhancing Flexibility in Learning

Systematic reviews demonstrate that flexibility and accessibility are among the most consistently cited benefits of online learning, particularly for students balancing work, care responsibilities, or geographical constraints. The lockdown highlighted the importance of flexibility in attendance, participation, and learning methods. Flexibility emphasises accommodating diverse student needs through hybrid attendance options, self-paced learning, customised learning paths, and blended learning models. Financial and other pressures often make physical attendance a lower priority. After re-imagining our teaching during the emergency period, we have gradually returned to campus, but into a fundamentally changed landscape. The measures we introduced during the pandemic such as customised digital catch-up resources, pre-prepared online content, asynchronous feedback, and digital modes of creative practice have unintentionally contributed to a perception that in-person attendance is optional. Students also report that course content itself is influencing their choice to engage, or not, in-person, as well as a desire for greater flexibility and overall personal choice in tailoring their studies post covid.⁶

Students have experienced online learning as a legitimate and flexible mode of education, and many now regard it as a standard part of their learning environment. They have grown accustomed to the flexibility of online learning and are questioning the value of attending in-person sessions. Since

returning to on-site teaching, staff have noted a consistent decline in in-person attendance. As one colleague observed, “Even years later, students assume there will always be an online option, even when one isn’t offered... and this expectation is now shaping how we design our courses” (FA2). Students’ expectation of flexible, technology-supported learning signals a long-term cultural change rather than a temporary response to a crisis.

For the creative arts, students growing expectation of online learning as a component of study is seen as both an opportunity and a constraint. Flexible, online provision can widen access, improve inclusivity, and enhance learning through flipped classroom modes, asynchronous research, and lecturer curated digital resources. However, as our participants repeatedly pointed out, hands-on studio learning depends on material encounters, embodied encounters, access to specialist equipment, and the social dynamics of shared making. These are not easily “translated” online. When attendance patterns fragment, one of the risks is that the tacit knowledge that emerges through proximity to peers and technicians, the serendipity of being in the studio, and the formative value of live critique are diluted.

Our interviews revealed a shifting educational landscape shaped by growing reliance on digital tools and pre-prepared resources. One lecturer described this shift as “a kind of digital repository way of teaching” (De1), noting that students increasingly depend on technology and expect materials to be provided in advance, which in turn requires teachers to be “much more prepared” (De1). Another highlighted the challenge of helping students “understand the responsibilities and advantages of group learning in a physical space” (M1). More broadly, this transformation was linked to changing learner identities; as one participant observed, “Digital natives appear to have a different sense of self and of the world” (De3).

Leveraging Technology

Our participants noted that some components (recorded briefings, content lectures/seminars, essay writing classes, recorded demonstrations) can be successful as online or asynchronous delivery, while other experiences (material experimentation, technician-guided skill acquisition, group critiques, installations of work) require on-site studio time. In fact, several reported that they would not go back to previous in-person practices for some parts of courses. A recurring theme was that hybrid learning is particularly well-suited to more theoretical or text-based learning (e.g., essay writing, reading groups, creative education courses). As one participant explained: “I discovered the social reading platform Perusall, and it’s fantastic. I don’t do in-person tutorials anymore, the use of Perusall has replaced them for me” (M2).

The design lecturers talked about how digitally supported learning environments enhance flexibility, foster student autonomy, and encourage more continuous engagement with course material. They also described the value of personalising learning pathways and better supporting diverse ways of learning. Studio learning thrives on peer exchange, and the design staff in particular pointed out how hybrid formats can amplify this by enabling distributed and delayed critique, and collaborative ideation in multimodal ways offering different ways to participate. This was seen as especially important for students who find traditional in-person studio peer learning challenging. These perspectives align with other scholarship on digitally supported studio learning. Harasim highlights video conferencing as a transformative development in educational practice: “what is new and different is that [online] conferencing ensured that dominance by a few does not prevent others from having their say”.⁷ Wragg argues that online design education is possible when the studio model is re-thought for its contemporary context rather than traditional studio experience.⁸ And Fleischmann found that online peer critique enabled a highly collaborative exchange of tacit and explicit knowledge.⁹ Anonymity and digital records supported honest communication and reflective learning, suggesting this structured

approach is valuable for both fully online and blended studio settings. It was also noted in our study that advancing digital literacy is becoming an increasingly essential component of creative professional practice for students. Compared with lecturers in music, fine arts, and dance, design staff were much more positive about technological integration in teaching. They tended to view hybridisation as strengthening studio learning.

Shifting Perspectives

The experience of teaching remotely during COVID initiated a process of reflexive inquiry. In line with Cutcliffe et al. (2024),¹⁰ our findings suggest that this experience encouraged consideration of whether, and in what ways, online teaching might meaningfully contribute to studio learning environments but also to ask more fundamental questions. Mishra and Koehler's TPACK model¹¹ emphasises the connections, interactions, affordances, and constraints between and among content, pedagogy, and technology. In taking all three together, incorporation of a new technology forces us to confront basic educational issues because "this new technology or medium reconstructs the dynamic equilibrium among all three elements".¹² Integrating digital technology systems leads to asking questions of our pedagogy, often fundamental ones, leading to a potential reconfiguration of some, or all three components. Reflections of this kind were evident in our study, as participants articulated:

"Something that the mixed environment educated me in was, I had some quite fixed ideas of what constituted effective student behaviour and this was challenged by the covid situation, for instance, highly discursive students find it easier to meet my teaching expectations, because they talk, they respond, but who does that exclude? Now when I've come back into the classroom and people are not participating I am asking how can the classroom change to get something out of those people and support those people rather than making them behave in a certain way." (FA3).

"Most important is to provide multiple modes of response, giving students a range of equal opportunities to participate -spoken, written, some based on more private work than others and to change the basic parameters of what you think are successful interactions" (FA3).

Stone's reminder that "even in the age of the techno-social subject, life is lived through bodies"¹³ was reflected in our lecturers' discussions of technology and pedagogy:

"We live in a physical world. Technology can help augment our experiences, but it shouldn't be something that we disappear into. And so the metaverse and, you know, that that sort of aspect of learning kind of makes me a bit sad" (De1).

"I would say that there has been such a shift into the digital world, that actually that sort of tactile way of learning gets really quite easily forgotten" (De2).

The findings highlight the central role of embodied, spatial, and temporally situated studio experiences in creative arts education, with staff valuing in-person teaching for its rich, spontaneous, and dialogic interactions. At the same time, the move to online teaching encouraged critical reflection on established practices and enabled experimentation with online learning. Participants noted that technology enabled new forms of engagement, collaboration, and reflection that were difficult or impossible to achieve in traditional studio settings, opening up additional teaching and learning opportunities that now sit alongside, rather than replace, in-person studio pedagogy. Ultimately, the question becomes when and why different modes of teaching meaningfully enhance student learning.

FUTURE PRACTICE

Research shows that meaningful aspects of studio learning can be supported online, even though the studio cannot be fully replicated. Wragg¹⁴ argues that while complex, design teaching in an online environment is possible, some of the barriers to online design education relate to the traditional studio experience, which differs to the contemporary on-campus design studio. Curated materials,

synchronous workshops, and digital critique spaces can preserve core elements of studio culture when intentionally designed. Fleischmann notes a clear shift toward long-term acceptance of select online elements, even in design domains focused on physical studio skills, but adds that specific subject settings will differ in their adoption of blended learning.¹⁵ Current literature shows the design education community to be more open to technology-enhanced learning compared with visual or fine arts, though the traditional studio model and other distinctive characteristics common to all creative arts learning represent significant barriers to their seamless adoption.¹⁶ Across the literature, there is strong consensus that the future of higher education is hybrid and blended, not fully online nor fully face-to-face. For studio learning modes, this could mean physical studios for material, embodied learning and online spaces for some aspects of critique, reflection, documentation, collaboration, as well as enabling expanded access.

As universities navigate the shifting terrain of post-pandemic higher education, marked by evolving student expectations, technological integration, and new models of flexibility, studio learning stands out as a pedagogical approach uniquely aligned with the future. Higher education research identifies active, project-based, and transdisciplinary learning as directions across disciplines, citing creative and studio-based traditions as leading examples.¹⁷ Studio-based learning reflects many aspects of what students will actually do in professional and civic life: work on messy, open-ended problems with others, integrating knowledge, judgement, and values. Unlike traditional subject-based learning, where knowledge is partitioned into discrete domains, studio learning mirrors the real behaviour of creative practitioners who routinely cross boundaries to gather whatever information, tools, or perspectives are useful. By cutting across disciplinary boundaries it cultivates the kind of innovative, integrative, and relational thinking essential for transformative learning. Valued for its ability to foster ways of understanding that challenge habitual perspectives, SBL is increasingly being explored as a model for transdisciplinary higher education.

Future higher education needs pedagogies that support student identity, belonging, and participation. Studio education does this structurally. Belonging and identity are now widely recognised as central to student success; studio pedagogy builds them into curriculum design rather than adding them as support. The online translation of studio-based learning remains contested, recognising that the studio's material, spatial, and social practices cannot be entirely replicated online. At the same time, aspects of critique, dialogue, and reflection may be reconfigured digitally, though educator scepticism exacerbated by the pandemic's emergency shift to online studios continues to shape perceptions of what is pedagogically possible. Consistent with findings in other studies, our research shows that while online studio teaching should not attempt to replicate or replace the on-campus studio experience, thoughtfully integrated blended learning is a critical component of education today, especially through embedded, inherently social activities that build a community of practice.¹⁸

As higher education navigates rapid technological change, shifting student expectations, and increasing demand for flexibility, studio pedagogy offers a powerful model for the future: one that is iterative, relational, identity-forming, and deeply attuned to the complexities of real-world practice. Our work suggests that post-pandemic higher education, including studio based teaching and learning, is neither a return to tradition nor a wholesale shift to digital delivery, but an expanded pedagogical landscape in which hybrid, flexible, and socially rich forms of learning coexist.

NOTES

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FROM PLAY TO SCHOOL READINESS: A VYGOTSKIAN ANALYSIS OF THE ROLE OF PLAY IN EARLY CHILDHOOD DEVELOPMENT

Author:

YANXI LIU

Affiliation:

UNIVERSITY OF MANCHESTER, UNITED KINGDOM

INTRODUCTION

In the field of early childhood education, play has long been a contested principle. In the first half of the 20th century, play was gradually recognised as an academic discipline.¹ Vygotsky's cultural-historical approach especially emphasised the importance of play in children's development, laying the theoretical foundation for subsequent research.² Vygotsky proposed that human cognition originates from social interaction and is internalised through the stages of speech development, from social speech to private speech, and finally the formation of inner speech.³ Under this framework, play becomes the key situation in this transformation process, and is still widely studied and applied around the world.⁴ This study believes that, despite increasing methodological diversification in early childhood research, play theory constantly provides an irreplaceable framework for understanding how play can systematically build cognitive scaffolding for formal learning. The following sections will critically examine this theoretical framework and related criticisms, and analyse the core value of it as a mechanism for children's school preparation.

THEORETICAL FRAMEWORK

The structure of this research follows the theory of human learning of Vygotsky, which also constitutes the philosophical basis of this study.⁵ He proposes that the social dimension of consciousness is prioritised at both the time and factual levels. Human cognition is closely related to social and cultural history, and social interaction is the foundation of all learning. This process begins with social speech (verbal guidance of others), develops into private speech (self-directed vocalisation), and finally internalises into inner speech (self-regulation). Children initially acquire knowledge through interaction, and then go through the process of assimilation and personalisation.

Based on these three stages of speech development, this article will systematically discuss: 1) how play becomes the driving force of social interaction; then 2) analyse their role in cultivating self-regulation ability; and 3) finally evaluates the contribution of play to the development of abstract thinking. Through this structure, this article takes demonstration play as a key development activity, which effectively lays the foundation for children to receive formal education.

PLAY AND SOCIAL INTERACTION

Play provides a suitable social foundation for children to develop cognitive scaffolding. In this regard, play cultivates the abilities that children need to thrive in the school environment: collaborative problem-solving, emotional regulation, and compliance with role rules.

The Zone of Proximal Development (ZPD) theory proposed by Vygotsky is applicable to formal learning environments and play activities.⁶ It explains the gap between the ability of learners to complete tasks independently and the level that can be achieved through social interaction. Under this framework, play creates the ZPD for children to support their behaviour beyond their age. Specifically, as a dynamic generator of ZPD, play expands children's imaginary operation, hypothetical situation construction, and the germination of motivated will.⁷ Play provides an ideal environment for all participants to develop such skills through social interaction and collaboration. Additionally, empirical neurological findings further confirm that play can enhance long-term development in working memory and cognitive flexibility, which is crucial for school readiness.⁸

Leading activities proposed by Elkonin further clarify how diversified social participation becomes the main driving force for development for all ages.⁹ For children aged 3-6, pretend play fits the intrinsic driving force of their exploration rules. Pretend play refers to a special form of play in which children act "as if" in a real scene.¹⁰ During such playing processes, children often imitate socially idealised adult roles such as doctors and policemen, and internalise cultural norms through role-playing.¹¹ Children will subconsciously display prominent characteristics of adult roles they observe on a daily basis. As explained by Vygotsky, children internalise the 'idealised form' given to these roles by society through this play activity, which is part of their early social internalization development.¹² Such play can not only promote their attention and cooperation in solving problems, but also shape their future career aspirations.

PLAY AND SELF-REGULATION

Play not only promotes social participation and interaction, but also enables children to internalise external rules and expectations as intermediate scaffolds. Specifically, it reflects children's ability to control impulses, monitor and adjust behaviour, and guide attention and emotions through the way children express themselves to others and themselves.

Vygotsky's concept of "fictitious I" provides a strong framework for understanding this transformation.¹³ During pretend play activities, children suppress immediate impulses and follow the specific rules determined by the characteristics of pretending to be the role.¹⁴ The tension between real emotions and fictional emotions, "dual affect," actively cultivates self-regulation ability and the control of will. Empirical studies confirm that children unconsciously internalise social norms and maintain goal-oriented behaviour in play situations for a significantly longer time.¹⁵ For example, when playing the role of a guard, a child can stand upright for a long time. Furthermore, the Tools of the Mind curriculum exemplifies systematic self-regulation training that has been successfully implemented in the United States, Chile, and Canada.¹⁶ This practice shows how play functions as a strategy to enhance children's ability to abide by school rules and focus on tasks. Critics such as Nome believe that play activities designed around the educational goals defined by adults may weaken children's autonomy and intrinsic motivation.¹⁷ Nevertheless, balanced scaffolding through adults enriches resources without controlling the environments. Such support promotes mature play characterised by complex role negotiation and rule systems, thereby further fostering autonomy, self-regulation, and cognitive development.¹⁸

Private speech is another key element in shaping the self-regulation ability in children's play.¹⁹ When children verbalise self-instructions ("Now I will move this puzzle") and use language to plan actions and clarify problems in playing, the enhanced self-awareness and behavioural regulation

ability will promote their faster adaptation to future campus life. When private speech is gradually internalised, it will evolve into silent language thinking, inner speech, to further strengthen their conscious planning and emotional regulation ability. Although early studies questioned the usefulness of private speech on task performance and argued that silent children even perform better,²⁰ subsequent research indicates its most pronounced effective situations.²¹ Empirical studies clarify that its benefits are most pronounced in moderately challenging tasks and emerge over time, potentially promoting continuous resilience and metacognitive awareness.²² As a form of self-directed language, private speech can also directly help children develop their literacy skills, which benefits their schooling.²³

However, it should be pointed out that Vygotsky's theory of self-regulation and private language is established in a specific cultural and historical context, and its applicability is not unlimited. The theory tacitly assumes that children gradually develop self-regulation abilities through language internalization in a relatively stable structure of social interaction, but this assumption may underestimate the differential understanding of the relationship between self-control, emotional expression and authority in different cultures. In some educational contexts, adult-led interaction, language usage norms and high emphasis on submissive behavior may change the function and expression of private language in development. This reflection does not undermine the explanatory power of Vygotsky's theory, but suggests that researchers need to examine how cultural differences and time conditions interfere with the formation of developmental mechanisms when using the theory to analyze games and self-regulation. It also further highlights the importance of adopting multi-methodological research approaches in order to avoid generalising theoretical models formed in particular historical contexts.

In general, play promotes self-regulation and cognitive development through internalised roles and self-dialogue. Once the self-regulation function is established, play can help children develop higher-level cognitive abilities, including self-control and resilience, which are crucial to completing academic tasks.

PLAY AND ABSTRACT THINKING

Through the internalisation of social interaction and the accumulation of experience, children's ability to separate object and its meaning is the final stage of scaffolding abstraction and school preparation. Vygotsky's object-dependent stage points out that children under the age of three's understanding of the situation is still closely related to the direct perception of objects.²⁴ Play promotes the transition of their thinking from concrete objects to abstract concepts, which enhances their creativity, divergent thinking, and associative reasoning ability.²⁵ In this regard, play not only lays the foundation for children's abstract thinking but also stimulates their imagination and creativity.²⁶

Under this framework, playing activities take a central part in two key stages of development. First, adults guide children to separate meaning from objects through language interaction. For example, a wooden stick may represent a horse in play. Second, children begin to use material and social roles as tools to transform these symbols into psychological tools. When children simultaneously perform verbal descriptions and operate wooden sticks (such as "my horse is running"), the interaction between the two media raises thinking from concrete actions to abstract planning. In other words, they transform specific items and meanings into operational thinking tools during the play. Programs such as Lindqvist's Playworlds operationalise this process by asking children to write letters to Martians or design desert well drilling schemes.²⁷ It promotes abstract reasoning, early literacy ability, and creative thinking. Although Fein and Apfel critique Vygotsky's object-dependent stage theory by examining how children can separate perception from specific objects as early as the age of two, they also admire the positive role of play in stimulating creativity.²⁸

Critics argue that Vygotsky's model treats play as merely a transition tool and underestimates other spontaneous activities, such as physical exploration.²⁹ Notably, these criticisms challenge the instrumental view of the play to propose a more comprehensive recognition of diverse play. By improving Vygotsky's theory, they highlight the significance of play. During the gradual enhancement of children's ability to use multiple symbol systems, play has laid the foundation for their adaptation to the increasingly complex knowledge in formal education.³⁰ Overall, play provides children with key tools to negotiate complex academic and social environments in their later education.

CONCLUSION

Based on Vygotsky's cultural-historical theory, this paper argues for the central role of play in children's development. By analyzing the three interrelated development processes of social interaction, self-regulation, and abstract thinking, the paper points out that play is not attached to the preparation activities before formal learning, but a key development mechanism that is internalized through social mediation and psychological tools to systematically support children's school adjustment.

At the same time, this essay also suggests that the developmental processes that games carry are difficult to fully grasp through a single, static, or outcome-oriented approach to research. Key mechanisms such as the generation of private language, role negotiation, and internalization of rules tend to unfold gradually in specific interactive situations and change over time. It is therefore necessary for future research on play and school readiness to adopt methodological pathways that can simultaneously capture developmental trajectories and situational differences. For example, combining longitudinal quantitative measures with qualitative methods such as classroom observation and interactive discourse analysis can contribute to a more nuanced understanding of how games function in different educational contexts.

At a practical level, this analysis suggests that educational policies need to be wary of using games as a single means of academic promotion. Institutionalised game-oriented teaching relies not only on curriculum design, but also on teachers' professional ability in guidance, reflection, and situation judgment. By maintaining theoretical and methodological sensitivity, relevant research can provide a more explanatory evidence base for children's school preparation and long-term learning development.

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BIG EDTECH PLATFORM ASSETISATION AND ACADEMIC AUTONOMY

Author:

GORDON R. MITCHELL

Affiliation:

UNIVERSITY OF PITTSBURGH, UNITED STATES

INTRODUCTION

Corporate research, development and marketing of digital products to schools went into bullish overdrive during the years following the global Covid-19 pandemic, spurring a “seller’s market” in education technology “solutionism.”¹ Amid accelerating “datafication” and integration of digital tools into pedagogy, today this continuing trend drives broad “dimensions of change” in higher education, each with weighty implications for academic autonomy.² Consider one such dimension of change—how the recent surge of venture capital investors into the educational technology (EdTech) space marks emergence of “Big EdTech”³ actors with power to promote digital products at scale, control narratives and structure academic labor.⁴

As Janja Komljenovic and colleagues observe about Big EdTech investors, “there is a significant need for more research to attend to these increasingly powerful actors in education.”⁵ Accordingly, “university technology procurement procedures, and contracts between HE [higher education] institutions and technology providers, have become immensely important in setting the rights and obligations of the different parties, as well as end users of technology.”⁶ Such texts offer windows into the process of “assetisation”—conversion of academic thought into data units with market value.⁷ USA EdTech company Packback presents an illuminating case in point—it began in 2014 as a scrappy textbook rental startup and was eventually transformed by one of those emergent Big EdTech actors—PSG Equity—whose 2024 strategic investment put Packback on the map as one of the fastest growing, AI-driven education firms.

The following critical analysis of the dull documents tethering Packback to its customers in higher education focuses on procurement procedures and contracts. Communicative analysis of these texts stands to place in high relief points of tension between Packback’s Big EdTech platform and norms of pedagogical autonomy, quite counter to the “pedagogy-first” ethos inscribed in the company’s mission statement.⁸ A rhetorical framework for analysis shows how strategies of argument invention are available to support “observed corrections” in routine texts such as corporate terms of use agreements, revealing a possible suite of tools useful for defending academic autonomy in the age of platform assetisation.⁹

PACKBACK’S CORPORATE HISTORY

In 2013, students Mike Shannon, Kasey Gandham, Nick Currier, and Jessica Tenuta launched Packback—a startup company “born in a college classroom” at Illinois State University, providing other students with options to rent course textbooks inexpensively for just a few days at a time.¹⁰ The

group soon hit it big on the American reality television show *Shark Tank*, where celebrity investor Mark Cuban staked the co-founders to a \$250,000 equity deal.¹¹ Cash infusion in hand, Packback began pivoting to instructional artificial intelligence, in 2016 creating “Questions”—a gamified online platform designed to spur students and teachers to make their online course discussions more rewarding and dynamic. Packback’s instructional AI system calculates and ranks student discussion scores on an avatar-populated “Learner Leaderboard” based partly on machine-awarded “curiosity points.”

By 2021, over 3,500 faculty and 900,000 students nationwide were using Packback, with trade publications identifying it as “one of the fastest-growing private companies in the USA.”¹² The company continued adding to its tool suite, building a “Deep Dives” feature to provide students with real time feedback on their long-form essays (including a “Writing Lab Pro” upgrade option that unlocked an “AI-writing aide” with more features if students shared their credit card information).

One factor driving its rapid growth was Packback’s ability to integrate its digital tools directly into the Learning Management Systems maintained by higher education institutions.¹³ Packback also was able to gain market access through university bookstores—working with professors and bookstore managers directly to create ISBN billing codes, enabling Packback products to be billed, like textbooks, directly to students’ university accounts. That delivery strategy reinforced the company’s narrative as a “pedagogy-first” company with roots in teaching (see Fig. 1).

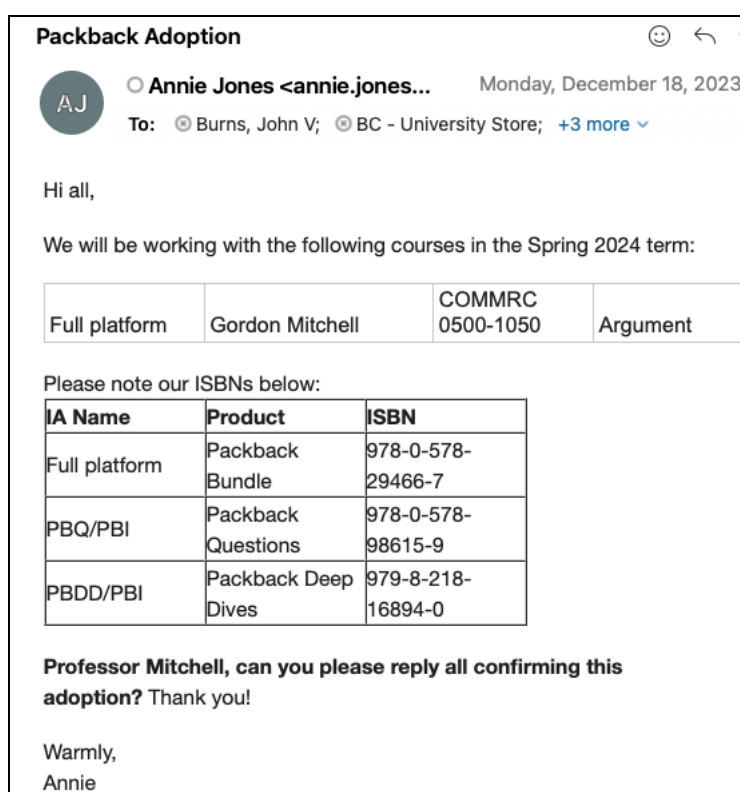


Figure 3. Packback ISBN/University Bookstore course routing, December 18, 2023.

In 2024 the growth equity firm PSG made a major announcement about Packback: “We believe Packback’s unique and innovative platform is helping to shape the future of education by integrating instructional AI to advance both student and educator experiences,” trumpeted PSG’s Rick Essex after announcement of his venture capital firm’s new strategic equity investment.¹⁴ This investment reflected a broader trend of PSG plowing more of its \$28 billion asset holdings into the EdTech

space.¹⁵ Although terms of the private transaction were not disclosed, a general rule of thumb is that “in return for financing one to two years of a company’s startup, venture capitalists expect a ten times return of capital over five years.”¹⁶ Packback CEO Kelsey Behringer framed PSG Equity’s strategic investment as recognition that her company had “developed AI models to promote student success and lighten the administrative burden on educators.”¹⁷

ANATOMY OF AN EDTECH LOCKOUT

Barely six months had passed after PSG’s announcement when an event took place that serves as something that rhetorical theorist Kenneth Burke would call a “representative anecdote” about Packback, in the sense that the episode epitomizes synecdochically how Big EdTech had arrived on the scene and was putting its stamp on trajectory of the company.¹⁸

For those in classes using Packback during Fall 2024, the semester began typically enough: teachers activated Packback on their course LMS and notified university bookstores, who billed student university accounts (typically \$39-\$49 per student). Students, after agreeing to Packback terms of use, began entering their coursework via the Packback plugin active in their course LMS. But on September 26, 2024, students and teachers were greeted abruptly with the following message when attempting to log on to Packback via their LMS (see Fig. 2).

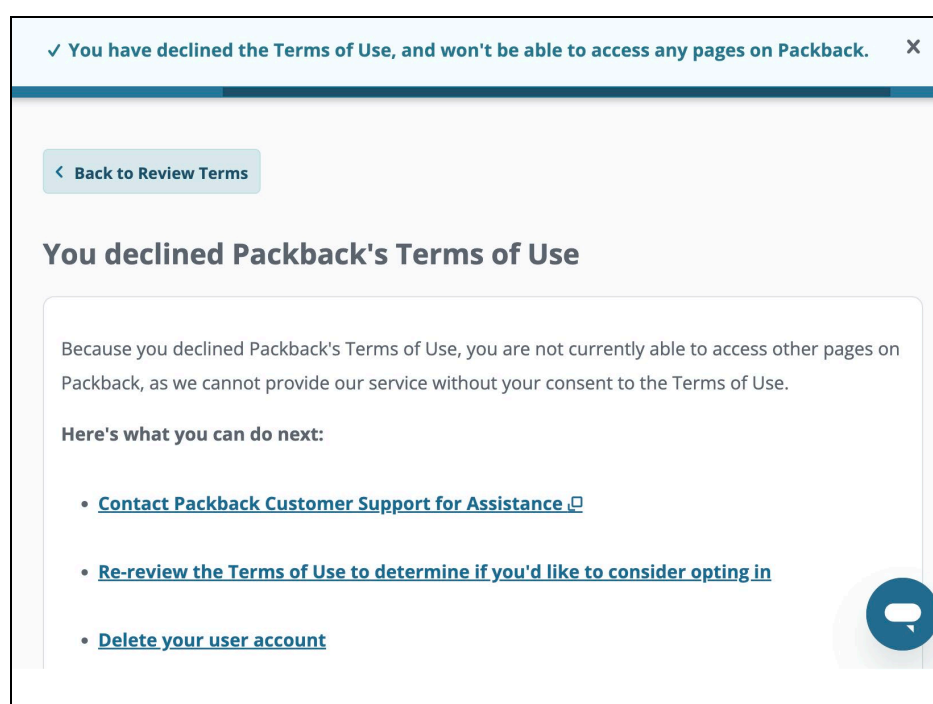


Figure 4. Screenshot of Packback Terms of Use page following attempt to access course materials, September 26, 2026.

Although students had, just weeks before, already signed a terms of use agreement at the outset of the semester, now they were being told that a condition of their re-accessing their own coursework on the platform would be to agree to a 7,400-word revised terms of use document. Packback provided no options to defer the decision or otherwise access course materials until such consent was secured. Later, Packback’s Director of Customer Success Annie Jones conceded that the method and timing of the revised terms of use rollout was “certainly disruptive” to classes.¹⁹

Compounding matters, Packback’s revised terms of use contained controversial new elements relating to intellectual property and artificial intelligence, for example prohibiting users from analyzing their

own coursework on AI platforms other than Packback. The new terms also asserted sweeping corporate control of student data, stipulating Packback “will own all right, title and interest in all aggregated and anonymized data and information” generated on the platform.²⁰ Such terms clashed with courses in progress that were already using their own anonymized aggregated student discussion text for AI-assisted pedagogical purposes (e.g. see Fig. 3).



Figure 5. Snapshot of two-week window in graduate seminar on critical participatory research, University of Pittsburgh, September 2024.

The seminar depicted in Figure 3 employed a human-in-the-loop AI design: over a two-week period asynchronous student discussions hosted on Packback were anonymized, aggregated and analyzed by ChatGPT to generate brainstorming ideas for possible discussion topics to share in an upcoming in-person dialogue with a visiting scholar. This recursive pedagogy exemplified engaged, problem-based learning and demonstrated how humanities classrooms can work with—and critically against—AI systems. For this reason, Packback’s revised terms of use were particularly discordant with course themes and readings that focused on the role of intellectual property in participatory critical rhetoric research. These provisions directly contradicted the seminar’s focus on open knowledge production and academic freedom.

A Deloitte survey found 91% of customers don’t read terms of use prior to clicking accept.²¹ But in this case, the stark discordance between Packback’s revised terms and the seminar’s commitments demanded attention. To crystallize such points of discordance, “signing statements” were used to isolate how specific language in Packback’s revised terms encroached on academic autonomy. In the US legislative process, following passage of a bill, occasionally the president will sign the bill, yet place certain caveats—“signing statements” in the margins.²² In this case, signing statements regarding AI, intellectual property and academic autonomy substantiated such objections to the revised terms of use in the Big EdTech space (see e.g. Fig 3 and Fig. 4).

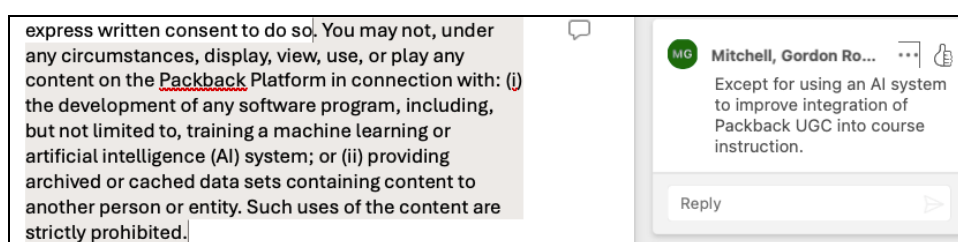


Figure 3. Packback revised terms of use signing statement on third-party AI use, September 26, 2024.

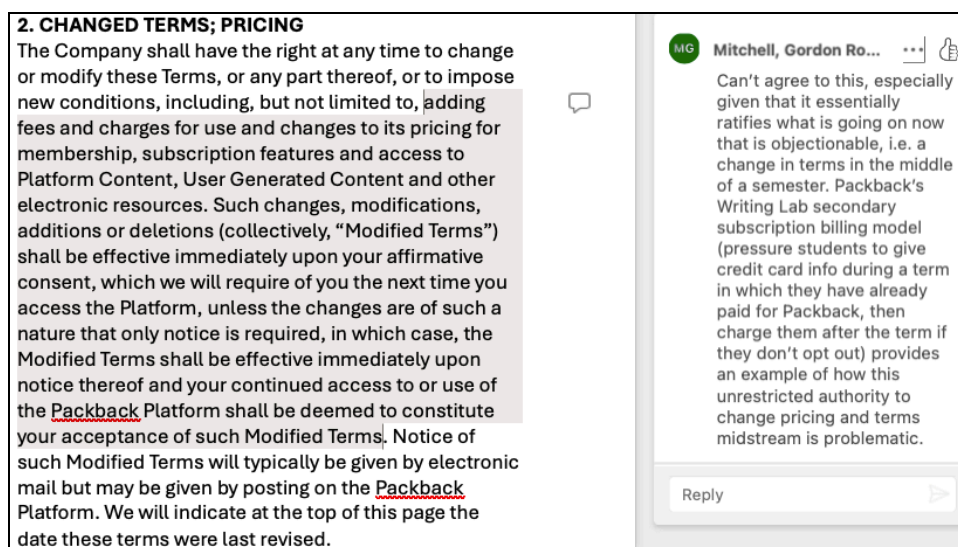


Figure 4. Packback revised terms of use signing statement on changed terms, September 26, 2024.

The signing statements were effective in stimulating extensive follow-up conversations—including email correspondence and recorded (with consent) Zoom calls—with customer liaisons, the Director of Customer Success, and other Packback officials. During these discussions, the parties reviewed the signing statements and explored potential solutions. After an initially positive response from lower-level staff, the Director of Customer Success later wrote that Packback's executive and legal team—including CPO Jessica Tenuta—had reviewed the matter and clarified, “a ‘signing statement’ would not amend our Terms of Use” and that “unfortunately we can't change the platform view for your students that would allow them to bypass the Terms of Use.”²³

CONSUMER REPORTS AND COMPLAINTS

In response students in the doctoral seminar voted unanimously to walk away from Packback, reconstruct their lost assignments, and shift online discussions to a different platform on the LMS for the rest of the semester. Detailed transcripts of discussions with company officials served as a rich evidence base for subsequent consumer reports filed with the U.S. Federal Trade Commission (FTC) and Pennsylvania Office of the Attorney General.

The FTC consumer report highlighted how Packback uses deceptive “negative option” marketing to upsell students from its entry-level (often through bookstores) Writing Lab subscription to “Writing Lab Pro,” a premium tool that gives students access to an AI tutor. Students in Packback-enabled courses are offered “free access” to Pro during the term but must enter credit card details and accept a billing cycle that automatically begins after the course ends—a “free-to-paid” arrangement designed to convert student inaction into paid subscriptions.

The consumer complaint argued this practice may violate the FTC's Negative Option Rule and bears similarity with corporate conduct criticized in the FTC's enforcement action in the ABCmouse case.²⁴ The complaint argued further that free-to-paid negative option secondary advertising of this sort, when introduced to academic contexts, creates an “Academically Pressurized Negative Option” in which instructors' adoption of Packback implicitly nudges students toward an extra paid product, potentially harming students financially and encroaching on instructors' academic autonomy.²⁵

On the state level, a complaint to the Pennsylvania Office of Attorney General argued that Packback's mid-semester lockout barred students and instructors from accessing essential coursework until they agreed to inferior, revised Terms of Use, disrupting the academic process by coercing users into

accepting new conditions to regain access to materials integral to their learning and grades. The report argued that the lockout violated basic principles of contractual fairness, as students, already financially committed to the tool, were left with no meaningful alternative but to acquiesce. Brian Murray, Consumer Protection Agent for the Pennsylvania Office of Attorney General, fielded the complaint and initiated a voluntary mediation process (see Fig. 5).



Figure 5. Brian Murray, Letter to Gordon Mitchell, October 22, 2024.

This process spanned months and entailed multiple exchanges of memos with Robert Schaul, an attorney representing Packback through its participation in the Pennsylvania Attorney General Office's mediation. After originally overlooking the lockout element of the consumer complaint, in a second, 6-page, single-spaced memo, Schaul minimized the friction caused by the Terms of Use revision and the Packback lockout, treating them as minor procedural events rather than disruptions that imposed additional work on students, instructors, and administrators.²⁶ By insisting that Packback's subscription model is transparent and easy to cancel, Schaul's memo concealed the platform's reliance on negative-option dynamics that further shift monitoring and decision-making costs onto users.

Framing the Terms of Use change as a mere clarification, Schaul obscured the labor required to interpret, adapt to, and redesign course practices around the new constraints. Pedagogical practices

involving AI-assisted writing or instructor feedback were suddenly, in the new terms, routed through Packback's data governance architecture, effectively redirecting educational labor toward the maintenance of its own corporate platform boundaries. This rhetorical minimization mirrored broader Big EdTech strategies in which efficiency claims mask the outsourcing of institutional responsibilities to users and the consolidation of value within the platform's proprietary data infrastructure. This process becomes palpable, from a communication perspective, when considering the following three key rhetorical strategies in Schaul's Packback defense memos.

Academic content as platform input

Schaul's memos assert Packback's right to use course content "to develop its platform," justifying provisions of the revised terms of use that claim corporate ownership of anonymized aggregated student data. This reframing of academic writing as raw data for system training is textbook assetisation: transforming student labor into proprietary platform capital. Such marketing is apparent in *Originality*, a new generative AI detection tool that Packback touts as effective given access to "50M pieces of student-submitted content" (see Fig. 6).



Figure 6. Marketing for Packback's "Originality" AI-detection platform. Screenshot accessed from Packback website, February 3, 2026

Learning as platform-mediated service consumption

Packback's reply memos treat learning tools as optional "technology products" rather than components of university infrastructure shaped by faculty decisions. In this framework learning becomes a consumer service. Students become paying subscribers. Course interactions become content generation events feeding platform development.

Load lightening

Schaul's first defense memo touts Packback's ability to "shorten feedback times" for students and instructors.²⁷ This trope recalls Packback CEO Behringer's comments after announcement of the PSG strategic investment, highlighting how her company's tools "lighten the administrative burden on educators."²⁸ Yet this load-lightening prospect is dimmed when scarce faculty and student resources must be redirected, in the middle of semesters, to address LMS platform interruptions and digest voluminous legal documents under time pressure. This fact pattern aligns with findings of the UK study that cases for EdTech tool integration with university platforms are often supported by faulty "resource redirection chimera" arguments, in which the labor-saving promise of an initial EdTech

contract is transformed into an administrative albatross later, when terms and conditions of use morph suddenly, like a chimera, in the midst of academic exercises.²⁹

Although Packback never budged during the Pennsylvania state mediation process, Schaul's extensive complaint defense memos provide an inside window into how Big EdTech shapes public discourse by utilizing such rhetorical strategies as *framing academic content as platform input*; *equating learning as platform-mediated service consumption*; and *highlighting load lightening*.

CONCLUSION

Packback's mid-semester 2024 lockout is more than a contractual dust-up — it is a direct assault on academic autonomy. By blocking students and instructors from their own coursework until they agreed to new Terms of Use, the company exposed how venture-funded EdTech can weaponize dependence on learning platforms. Faculty lost the ability to set conditions for their courses, students were coerced into surrendering rights just to stay afloat, and both groups saw their academic freedom subordinated to the dictates of a private vendor. This is not innovation; it is corporate strong-arming in the middle of the classroom.

The new terms made the damage worse. Packback barred the use of anonymized student writing with non-Packback AI tools and claimed ownership over aggregated student data. These restrictions strip educators of the freedom to explore alternatives, confining experimentation to a single corporate sandbox while commodifying student labor as proprietary fuel for the company's AI ambitions. Academic freedom — the right to pursue knowledge without external interference — collapses when the very tools required for coursework are repurposed into traps that channel intellectual energy into a private company's balance sheet.

The Packback case is a warning shot. If universities continue to hand over the keys to classrooms in the form of unvetted EdTech integrations, they risk ceding academic freedom to the logic of venture capital. Today it is a lockout over Terms of Use; tomorrow it may be algorithmic control over grading, data-driven performance mandates, or contractual gag clauses on faculty dissent. Institutions must draw a line: no company should be allowed to disrupt teaching mid-semester, commandeer student work for profit, or dictate how academic inquiry unfolds. The defense of academic freedom in the digital age will not be won in faculty senates alone — it must also be fought in the fine print of EdTech contracts.

NOTES

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- ⁴ Komljenovic, Sellar and Birch, "Turning Universities."
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- ⁶ Janja Komljenovic, Kean Birch, Sam Sellar, et al., "Digitalised Higher Education: Key Developments, Questions, and Concerns," *Discourse: Studies in the Cultural Politics of Education* 46 (2025): 276-292. <https://doi.org/10.1080/01596306.2024.2408397>
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- ¹³ In 2022, Packback rolled out "Writing Assistant"—another instructional AI tool designed to enable students writing papers to receive real-time feedback on grammar, spelling, and more complex areas such as research quality, via a plug-in accessed directly through university Learning Management Systems. Writing Assistant also is designed to provide support for teachers with grading assignments and plagiarism detection.
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- ¹⁹ Annie Jones, quoted in Gordon R. Mitchell, "Anatomy of an EdTech Lockout," Open Educational Resource, University of Pittsburgh D-Scholarship institutional repository, October 2024, <https://d-scholarship.pitt.edu/47011/>
- ²⁰ Mitchell, "Anatomy of an EdTech Lockout,"
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- ²⁵ FTC Complaint.
- ²⁶ Robert J. Schaul, letter to Brian Murray November 22, 2024; Gordon R. Mitchell, letter to Brian Murray, December 2, 2024; Robert J. Schaul, letter to Brian Murray, March 10, 2025.
- ²⁷ Schaul, letter to Murray, November 22, 2024.

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²⁹ Komljenovic, Sellar and Birch, "Seven Dimensions of Change."

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READING BEYOND THE UNIVERSITY: A LITERARY INNOVATION PROJECT FOR SOCIAL ENGAGEMENT

Author:

MARGARITA NAVARRO-PÉREZ

Affiliation:

UNIVERSITY OF MURCIA, SPAIN

INTRODUCTION

This article describes an innovative project-based programme to be implemented at the University of Murcia from January 2026 as part of a monographic literature course for fourth-year undergraduate students. The initiative responds to two pressing educational concerns identified in recent research: the rise in psychological complaints among young people¹ and the decline in reading engagement among adolescents.² By integrating literary analysis, language pedagogy, and community engagement, the project connects university assessment with authentic educational contexts.

The primary objective is to provide an innovative, hands-on approach to assessing university students through the design of pedagogical materials for secondary school ESL classrooms. Through this process, students apply literary and linguistic knowledge in realistic teaching scenarios while engaging in service learning that links academic work to social and educational needs. A secondary objective is to encourage secondary school students to engage with English through literature-based activities that address relevant emotional and social concerns to them, while also fostering interest in reading literary texts.

Working collaboratively at university in small groups, each group selects a literary work from a curated list and conducts a guided analysis focusing on themes, narrative voice, and language use. This analysis is informed by data gathered through the PAWS (Perth Adolescent Worry Scale) questionnaire administered to secondary school students, which identifies prevalent worries and concerns.³ Students are expected to examine how the themes and issues represented in the selected texts resonate with, reflect, or respond to the concerns identified through the PAWS data.

On the basis of this analysis, each group designs digital teaching materials – such as short videos, posters, or interactive presentations – for use in ESL classrooms at High School. These materials foreground selected excerpts and linguistic features of the texts and aim to promote discussion, interpretation, and meaningful language use. By centring activities on students' concerns and exploring them through fictional characters and narrative situations, the project enables secondary school learners to approach sensitive topics from a third-person perspective, thereby facilitating reflection and verbalization.

The project is expected to enhance university students' pedagogical awareness, critical literacy, digital competence, and sensitivity to language as a tool for expression and identity construction. For secondary school students, it aims to create engaging opportunities to use English meaningfully, reflect on shared concerns through literary voices, and develop motivation to read. Overall, the project

demonstrates how language and literature courses can integrate assessment, service learning, and socially responsive pedagogy within ESL education.

FOUNDATIONS INFORMING THE PROJECT

Building on the concerns outlined in the introduction – particularly the documented rise in psychological distress among young people and the parallel decline in adolescent reading engagement – this project is grounded in an interdisciplinary theoretical framework that integrates literary studies, emotional education, adolescent mental health research, and service-learning pedagogy. In response to growing evidence of youths’ mental wellbeing challenges, the intervention conceptualises literature not merely as an object of formal analysis but as a space for reflection, dialogue, and meaning-making. While the project does not implement bibliotherapy as a formal therapeutic practice, it draws on its underlying premise – that engagement with literary texts can foster emotional awareness and personal insight – by encouraging students to use literature as a mediated framework through which adolescents may explore and articulate their concerns.⁴ At the same time, the project is motivated by a further institutional concern: the need for academia to engage more actively with its social environment. The inclusion of service learning within the methodology therefore seeks to position university literary studies in direct dialogue with secondary education, fostering reciprocal exchange and socially responsive practice. By aligning literary themes with empirically identified adolescent concerns, the project advances an affectively informed and community-engaged pedagogical model. The following sections outline the principal conceptual strands that underpin the intervention, including current research on adolescent mental health, the relationship between literature and emotional wellbeing, reading motivation in ESL contexts, and the theoretical foundations of project-based and service-learning approaches in higher education.

Adolescent Mental Health Challenges and the Decline in Reading

Contemporary adolescents face unprecedented levels of psychological distress, creating an urgent need for accessible, evidence-based interventions that support emotional well-being and resilience. Recent research reveals a significant and documented rise in anxiety, depression, and other mental health challenges among young people globally.⁵ This escalating mental health crisis intersects with another troubling trend: a marked decline in adolescent reading engagement and motivation.⁶ These parallel challenges present both a crisis and an opportunity, as research demonstrates that strategically designed literary engagement can serve as a powerful, accessible resource for emotional awareness and personal insight.⁷

Adolescents’ reading motivation declines significantly from childhood through the teenage years, with multiple research studies documenting this consistent pattern.⁸ The barriers adolescents experience to volitional reading can be said to be multifaceted and reveal important contextual factors. These may vary from limited access to quality books aligned with their interests, to insufficient knowledge about how to select texts that resonate with them, restrictive school-based reading experiences that limit autonomy, social disconnection from reading communities, and pervasive time competition from digital media and academic demands. Additionally, negative experiences with reading in school – including rigid curriculum selections misaligned with adolescent concerns – contribute to declining engagement. However, when adolescents encounter literature that addresses themes central to their developmental concerns and emotional lives, reading motivation increases substantially, suggesting that access to relevant, student-centred literary selections represents a critical intervention point.⁹

The documented decline in adolescent reading engagement is particularly concerning given mounting evidence that reading for pleasure provides significant protective factors for mental health and

emotional resilience.¹⁰ Despite declining overall engagement, adolescents who do engage with literature report using reading as a coping mechanism for emotional distress, a space for self-reflection,¹¹ and a means of feeling less alone in their experiences. This suggests that rather than viewing reading decline as inevitable, educators and institutions should examine how literary engagement can be repositioned as a meaningful, accessible tool for emotional processing and development.

Literature as a Space for Reflection, Dialogue, and Meaning-Making

The project described in the introduction approaches literature, not as a clinical or therapeutic tool as and of itself, but as a dynamic space for reflection, dialogue, and collective meaning-making. This distinction is theoretically significant: rather than positioning reading through a clinical lens, an educational approach recognizes that literature naturally facilitates critical thinking, emotional awareness and personal insight through the interpretive and dialogical processes inherent in reading and discussing narratives. Such an approach is consistent with broader pedagogical theories that argue meaningful learning takes place when students engage actively with content, negotiate meaning socially and connect academic material to their lived experiences.¹² Fiction thus provides a structured space in which sensitive themes can be explored with greater comfort than might be possible in direct or clinically framed discussions.¹³

Empirical research further indicates that adolescents' engagement with reading intensifies when literary themes resonate with issues central to their developmental stage, such as identity formation, peer interaction, family relationships, anxiety, loss, and belonging.¹⁴ Literature serves an additional function in validating adolescents lived experiences. By engaging with narratives that depict challenges, emotions and perspectives similar to their own, young readers can feel less isolated and more understood. Longitudinal research has demonstrated that engagement in reading during adolescence is associated with improved emotional wellbeing and prosocial development, suggesting that literary exposure can contribute to resilience and adaptive psychological growth.¹⁵

In light of the growing body of evidence demonstrating the emotional, cognitive, and social benefits associated with reading and discussing literature, the present project seeks to extend these pedagogical advantages beyond the university classroom. Recognizing the transformative potential of literary engagement, the initiative adopts a methodology that enables university students not only to deepen their own interpretive and critical competencies but also to place these skills in the service of their broader educational community. More specifically, the project establishes a structured collaboration with secondary school students, with the aim of fostering meaningful literary engagement at an earlier educational stage. For this reason, service learning was selected as the guiding methodological framework, as it provides a model through which academic learning and community engagement can be productively integrated, allowing literary study to function as both intellectual inquiry and socially responsive practice.

Service-Learning and Community-Engaged Pedagogy: from the University classroom to the High School

Positioning university literary studies in sustained dialogue with secondary education through a service-learning framework constitutes a substantive reconfiguration of higher education's engagement with its social environment. Service learning integrates academic instruction with structured community engagement, creating pedagogical conditions in which disciplinary knowledge is applied within authentic social contexts while responding to articulated community needs. Rather than treating literary study as an exclusively intramural or abstract intellectual exercise, this approach situates interpretive practice within a broader civic and relational framework. In the context of

literature and adolescent emotional wellbeing, service learning enables university students to facilitate structured literary engagement with younger learners, thereby extending the pedagogical and socio-emotional benefits of literary discussion beyond the university classroom. Simultaneously, it supports the development of university students' pedagogical awareness, communicative competence, and reflective practice, while contributing to the emotional and intellectual growth of secondary school participants.¹⁶

As a pedagogical model, service learning is theoretically grounded in experiential learning theory and critical pedagogy, both of which emphasise that meaningful learning emerges through active participation, structured reflection, and dialogic engagement within socially situated contexts.¹⁷ When implemented authentically, service-learning fosters civic responsibility, develops practical and communication skills, and enables students to understand social issues from multiple perspectives. For university students engaged in service-learning with adolescents, facilitating literary discussion and engagement creates space for both populations to develop critical thinking, empathy, and social awareness. The reciprocal nature of service-learning – where both university students and secondary-level participants benefit – positions literary engagement as mutual meaning-making rather than unidirectional intervention. Research on service-learning outcomes demonstrates significant benefits for student development across academic, civic, and personal dimensions, with particular gains observed when service-learning is structured with intentional reflection, clear learning objectives, and meaningful community partnerships.¹⁸

Beyond its pedagogical efficacy at the classroom level, service learning must also be understood within the broader civic mission of contemporary higher education. The institutional imperative for higher education to engage more actively with its social environment has gained increasing prominence in recent years. Universities are widely recognized as possessing both the responsibility and the capacity to address societal challenges through the integrated functions of research, teaching, and community engagement. Within publicly funded higher education systems in particular, there is a growing expectation that academic work supported by public resources should generate meaningful social value beyond the confines of the university. The project presented here is explicitly conceived in response to that expectation: it seeks to ensure that the intellectual and pedagogical work undertaken within the university classroom is shared with, and contributes to, the surrounding community. By integrating a service-learning framework – particularly one that connects literary studies with pressing social concerns such as adolescent mental health – the initiative operationalizes this civic commitment, positioning literary education as both a site of scholarly inquiry and a vehicle for socially responsive engagement.

Affectively informed and Community-Engaged Pedagogical Project

Developing an affectively informed pedagogy that explicitly attends to the emotional and psychological dimensions of learning represents a significant reorientation in contemporary educational thought. Such an approach recognises that emotional engagement, motivation, and wellbeing are not peripheral to academic achievement but foundational to meaningful intellectual development. Within the ESL classroom, and particularly in the use of literary texts to accompany adolescent development, this framework situates emotional awareness and processing not as ancillary counselling functions, but as integral components of deep literary engagement and interpretive growth.¹⁹ When adolescents encounter texts that resonate with their lived emotional realities and are invited to explore these connections within supportive, dialogical environments, affective and cognitive development operate in tandem. Moreover, the mediating function of fictional narrative provides a protective interpretive distance: by discussing sensitive themes through the perspective of

third-person characters, students may articulate personal concerns indirectly, thereby reducing vulnerability while still engaging meaningfully with complex emotional material.

Community-engaged pedagogical models that align literary themes with empirically identified adolescent concerns create productive intersections between academic inquiry and lived experience. In the present project, these concerns are not inferred impressionistically but systematically identified through the administration of the Perth Adolescent Worry Scale (PAWS),²⁰ ensuring that the thematic alignment between literary texts and students' emotional realities is grounded in empirically collected data rather than anecdotal perception. By anchoring literary selection and pedagogical design in validated measures of adolescent concern, the project establishes a data-informed foundation for affectively responsive literary engagement.

This empirically grounded alignment is particularly significant in light of research on reading motivation and engagement, which consistently indicates that adolescents demonstrate deeper involvement with texts when they perceive them as relevant to their identities, interests, and social realities.²¹ When literature is experienced as meaningful rather than imposed, students are more likely to engage interpretively and emotionally. Accordingly, the design of pedagogical materials that explicitly address themes emerging from adolescents' articulated concerns enhances both engagement and interpretive depth. Within this project, university students develop creative and dialogically oriented materials for secondary-level English classrooms that centre on these identified thematic areas. Such intentional alignment not only increases motivation but also amplifies the emotional resonance of literary engagement, fostering reflective discussion and sustained interpretive investment.

Embedding this work within a service-learning framework further extends its pedagogical and social significance. The integration of service learning within this affectively informed, community-engaged model generates opportunities for reciprocal learning and transformative educational exchange.²² University students who facilitate the design and implementation of literary dialogue activities deepen their understanding of textual interpretation linked to pedagogical practice. Concurrently, secondary school students benefit from carefully curated texts and structured peer-based discussion, fostered by the materials created by the university students. Furthermore, they also experience a tangible expression of institutional commitment from the university. Rather than centring solely on interpersonal interaction, the initiative communicates that a publicly funded higher education institution acknowledges their concerns and is willing to invest intellectual, pedagogical, and institutional resources in responding to issues that affect their lives. In this sense, the project not only supports literary and emotional engagement but also enacts a model of socially accountable higher education.

At the institutional level, community partners – including secondary schools and educators – gain access to additional educational resources and sustained collaborative relationships with higher education institutions. When service-learning initiatives addressing literature and adolescent emotional wellbeing are embedded within institutional structures, supported by pedagogical training, and evaluated systematically, they have been shown to produce multidimensional benefits, including enhanced academic learning, strengthened university-community relationships, and measurable gains in adolescent reading engagement, emotional awareness, and sense of belonging.²³

Project-Based and Collaborative Learning as Pedagogical Structure

The pedagogical architecture of this initiative is further shaped by principles of project-based and collaborative learning, which provide the structural framework through which university students design and implement their pedagogical materials. Project-based learning (PBL) is grounded in constructivist and experiential learning traditions, positing that knowledge is constructed most

effectively when learners engage in sustained, inquiry-driven tasks oriented toward the creation of meaningful products for authentic audiences.²⁴ Within this model, students assume responsibility not only for interpreting content but also for transforming their understanding into tangible outputs that serve a defined social and educational purpose.

Within this framework, group-based project work serves not merely as an organisational strategy but as a pedagogical mechanism that facilitates deeper cognitive and social engagement. Collaborative learning theory emphasises that meaning is co-constructed through dialogue, negotiation, and shared problem-solving.²⁵ Working in small groups enables university students to articulate interpretations, challenge assumptions, and refine pedagogical decisions through collective reflection. Such interaction aligns with sociocultural perspectives on learning, which view intellectual development as mediated through social participation and communicative exchange.

In the present project, university students work in small groups, each group selecting and reading a complete novel from a curated list of literary works. The sustained engagement with a single text allows for in-depth thematic, linguistic, and interpretive analysis. The central project objective for each group is the development of creative pedagogical materials derived from their selected novel. These materials may take the form of short videos, interactive posters, digital presentations, or other multimodal artefacts specifically designed to stimulate discussion and reflection among secondary school students. The creative outputs are not ancillary to the analytical process; rather, they function as the culmination of interpretive inquiry, requiring students to translate literary analysis into accessible, dialogically oriented educational resources.

The group-based structure of the work is pedagogically significant. Working collectively, students must articulate interpretive positions, justify thematic selections, and co-design materials that responsibly address the adolescent concerns identified through the PAWS test. This collaborative dimension aligns with sociocultural perspectives on learning, which conceptualise knowledge construction as socially mediated and dialogically produced.²⁶

The artefacts created by each group are subsequently shared with secondary school students, thereby situating the project within an authentic communicative context. The materials are designed to encourage discussion around the selected literary themes and to create structured opportunities for adolescents to explore issues relevant to their lived experiences, at the time they use ESL meaningfully. In this way, the project-based structure integrates literary analysis, creative production, pedagogical reflection, and community engagement within a coherent educational process. The final products are not merely academic assignments but socially situated resources intended to foster dialogue, emotional awareness, and critical engagement among a broader educational community.

CONCLUSION

This article has presented the theoretical and pedagogical foundations of an affectively informed, community-engaged literary project that integrates ESL instruction, adolescent emotional wellbeing, and service learning within a project-based framework. By aligning literary study with empirically identified adolescent concerns and situating university learning within authentic community contexts, the initiative seeks to reframe literary education as both intellectually rigorous and socially responsive.

Although the project is ongoing, several anticipated outcomes may be identified. Institutionally, the initiative is expected to consolidate collaboration between the university and participating secondary schools, strengthening inter-institutional ties and laying the groundwork for sustained future cooperation. Such partnerships reinforce the civic role of higher education and position the humanities as active contributors to local educational ecosystems.

For university students, the project is designed to cultivate an understanding of academic work as socially meaningful and publicly accountable. By creating pedagogical materials that address documented concerns among adolescents, students experience their disciplinary knowledge as transferable beyond the university setting. In this sense, the initiative contributes to the broader aims of Sustainable Development Goal 4, particularly its commitment to promoting inclusive, equitable, and quality education, and to fostering learning environments that support both cognitive and socio-emotional development.

For secondary school students, the expected impact is equally significant. Through engagement with carefully selected literary texts and dialogically oriented materials, students may be encouraged to read the novels in greater depth and potentially rediscover curiosity toward literature more broadly. At the same time, the project aims to provide a mediated and protective framework through which adolescents can explore sensitive issues that concern them. By reflecting on emotional themes through the perspective of fictional characters, students are afforded a degree of interpretive distance that may facilitate expression, emotional awareness, and reflective dialogue. While the project does not constitute a therapeutic intervention, it aspires to contribute, in educational terms, to students' capacity to engage constructively with emotional challenges and to strengthen their sense of understanding and belonging.

Taken together, the initiative advances a model of literary education that integrates affective engagement, empirical responsiveness, collaborative project work, and civic responsibility. It demonstrates how university-based language and literature programmes can contribute not only to disciplinary expertise but also to socially accountable educational practice.

NOTES

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THE IMPACT OF A HYFLEX DEVELOPMENT PROGRAMME ON MODULE DESIGN: THE USE OF INTERACTIVE ASYNCHRONOUS ACTIVITIES

Author:

RICCARDO BENZO, PHILLIPA LE HEN

Affiliation:

BIRKBECK, UNIVERSITY OF LONDON, UNITED KINGDOM

INTRODUCTION

In 2023, Birkbeck, University of London launched a pilot programme for a teaching model centred around high quality, flexible and accessible learning experiences, called HyFlex: a mix of hybrid or blended learning and flexible. HyFlex teaching is based on Birkbeck's existing teaching and learning principles that combine the flipped classroom and active blended learning. Blended learning has been in place at Birkbeck since the pandemic, when courses were redesigned to address the need for online teaching.

Birkbeck has traditionally focused on part-time, evening teaching in Central London, but, as post-pandemic commuter patterns have changed, the flexible learning model needed to satisfy new student needs. The College Vision 2021-2026¹ kickstarted the development of Birkbeck Flexible Master's UK as an on campus/at home/at work portfolio of post-graduate programmes. Rollout of HyFlex pedagogy and HyFlex-enabled technology began in 2023, after receiving funding following a successful Office for Students bid in 2022. Phase one of the project closed in September 2025, with the installation of 74 HyFlex classrooms across the Birkbeck estate. In the pilot year 2024-2025, the academic year under discussion in this paper, 77 modules took part, affecting 1240 students.

Literature Review

Although not a novel idea by then, the flipped classroom started gaining momentum as a teaching and learning strategy in the 2000s.² Students are given the opportunity to learn at their own pace³ as they prepare for class. This means that Bloom's⁴ lower order goals should be achieved outside of contact hours, while synchronous learning activities can enhance the development of applied knowledge and skills⁵ in a particular field.

Bergman and Sams⁶ explain the idea of flipped classroom as "that which is traditionally done in class is now done at home, and that which is traditionally done as homework is now completed in class." For instance, the traditional lecture – typically understood as a 'one-way system' whereby knowledge is delivered from teacher to student with limited to no interaction⁷ – has been critiqued as direct instruction appears weaker than other forms of learning.⁸ On the other hand, one might look at it from an evolutionary standpoint so "[...] that engaged learning strategies combined with expository lectures result in more learning than continuous expository lecturing."⁹

This means that lecturing can still have a place in Higher Education teaching and learning models,¹⁰ even though, in many instances, it ceased to exist as a live session to become a recording or set of recordings¹¹ typically accessible to students via a Virtual Learning Environment (VLE) or Learning Management System (LMS) and, as such, can still be construed as a constituent component of the flipped classroom. This brought about two key changes: (1) a transition from teacher-led instruction to student-focused learning with (2) students increasingly responsible for their learning,¹² responding to the need for positive and effective innovation in education.¹³

The flipped classroom has demonstrated the potential to become a mainstay of teaching and learning due to features like “[...] supporting constructive educational processes [and] balancing direct self-learning education [...]”.¹⁴ In fact, the ‘inverted classroom’ is said to appeal all types of learners¹⁵ however classified, as it is facilitated by technology, which makes learning fully flexible via the constant availability of content i.e., asynchronous instruction.¹⁶

This approach can also help deliver ‘Differentiated Instruction’,¹⁷ thus facilitating the attainment of inclusive practice in Higher Education through “trust, [...] respect, [...] optimism [and] intentionality”.¹⁸ In summary, the flipped classroom has been shown to enhance learner development in academic, emotional, and social terms as well as having a positive impact on the learning experience overall.¹⁹

HyFlex teaching pedagogy

HyFlex was developed by Dr Brian Beatty in 2005, in response to changing student need and to increase enrolment. HyFlex courses are “multi-modal courses which combine online and onground (classroom-based) students”;²⁰ HyFlex learning provides flexible learning paths that enable students to decide, on a daily or weekly basis, which mode of attendance is best for them.

HyFlex learning is perceived as more flexible and accessible, allowing students greater control over their learning and providing more educational opportunities for those who cannot attend in a traditional manner. As such, opportunities for students to participate asynchronously are important; these activities can negate access issues if students lack the resources required to attend online classes,²¹ and aid in building rapport with a cohort that may not often, or ever, meet in person.

Adapting technology to enable HyFlex teaching and learning is important, but not sufficient to ensure a successful HyFlex experience; learning activities must be adapted.²² Detyna et al.²³ emphasise the need for pedagogical practices to take precedence over technology and recommend both pedagogical and technical training for staff. These issues are addressed in our HyFlex Development programme, discussed below.

Birkbeck teaching model

Birkbeck’s module design utilises Laurillard’s Conversational Framework²⁴ and six learning types, which emphasises the iterative nature of learning, the importance of dialogue between teacher and student, and the ability of technology to support blended learning. In addition, Birkbeck’s module design follows the Birkbeck Baseline: Moodle Module Standards, which prioritises consistent, accessible, and clearly structured modules. Pre- and post-sessional tasks outlined on Moodle should be completed asynchronously; students decide whether they wish to attend live sessions online or on campus, subject to visa and funding restrictions. HyFlex pedagogy stresses that the learning experience should be equitable, regardless of mode of attendance. Asynchronous activities should encourage and facilitate rapport-building, collaboration and communication amongst students; this is vital as they may not meet in-person.

HyFlex Development Programme

To aid in the successful rollout of HyFlex teaching, we developed a three-part HyFlex Development programme for lecturers. The current iteration of this programme covers Introduction to HyFlex, Design for / Adapt to HyFlex, and HyFlex Practice.

Introduction to HyFlex outlines Beatty's four key principles of learner control, equivalent learning, reusability, and accessibility, and the pedagogical benefits and challenges of HyFlex teaching, through a short asynchronous video. Design for / Adapt to HyFlex is a synchronous session, taught in HyFlex mode, which explains how the technology and learning tools available can bridge the learning pathways between online and in-person learning. It provides lecturers with the opportunity to apply design principles to their HyFlex modules, share and discuss their teaching through a design activity, and discuss how to mitigate HyFlex teaching challenges. Given its importance to HyFlex pedagogy, this session also focuses on applying accessible practices to HyFlex teaching as informed by a student-led consultation. HyFlex Practice combines both practical training on using the HyFlex technology with the opportunity to practice a HyFlex activity; willingness to implement new technology is essential for HyFlex to succeed.²⁵

Methodology

Pragmatism in Education Research

At Birkbeck, HyFlex is a student-centred approach to module design and delivery that provides students with a meaningful choice re: their mode of participation.²⁶

In the context of this research, the focus is on the practical consequences of introducing HyFlex²⁷ with a view to reflecting on the insights from the first full academic year of HyFlex 'operations' in relation to the HyFlex Development programme. This treats HyFlex as experiential²⁸ - something that possesses a physical character - in line with the adoption of a pragmatist philosophy that favours "a practical and outcome-oriented method of inquiry that is based on action and leads".²⁹

Specifically, the pragmatism advocated by Dewey³⁰ supports the importance of widening access through progressive practices: HyFlex fits this idea in contemporary times.

Research Design

To assess the impact of training and development during the afore-mentioned HyFlex pilot, the researchers rely upon a mono-method quantitative descriptive / explanatory investigation³¹ based on the interplay data observations and inferences from Moodle, the Virtual Learning Environment (VLE), and Bluera, the Module Evaluation Survey platform used to collect feedback from students.

This approach to research is akin to the application of study and research paths³² as a model of inquiry³³ to the project itself.

Small Sample Research

The research is based on the HyFlex pilot held during the 2024/25 academic year. Of the 74 participating modules, only 37 qualified for the analysis. It is deemed that "research conducted on a small scale is valuable for local evaluation and practitioner feedback".³⁴

Figure 1 provides a breakdown of the data collected divided by Moodle resources and activities (independent variables), and Module Evaluation Survey questions (dependent variables). Also, transforming i.e., computing and recoding³⁵ of variables (see Figure 2) is employed to allow for additional analysis to be performed.

Variables

Moodle resources and activities

Pre-sessional: Moodle Pre-sessional, Class Forum, Teams Class, Q&A Forum, Coursework (CW) Forum, OU Blog, Miro Board, Intros Forum pre, Recordings pre, Topic Discussion Forum pre, Self-evaluation Questionnaire pre, Moodle Questionnaire pre, Moodle Feedback pre, External Questionnaire pre, OU Wiki pre, Moodle Board pre, Moodle Choice pre, Padlet pre.

Live: Live Q&A Forum live.

Post-sessional: Discussion Forum post, Moodle Quiz post, H5P Test post, Moodle Feedback post, Moodle Questionnaire post, Moodle Chat post, Moodle Board post, Independent Research post, Glossary post, Homework via email post.

Module Evaluation Survey questions

General:

Academic support: How well are teaching staff supporting your learning on this module?

Learning resources: How well do resources in Moodle support your learning on this module?

Organisation and Management: How well organised is this module?

Learning community: To what extent did you engage with your fellow students on this module?

HyFlex:

Of all the sessions that have taken place on this module to date how did you attend classes?

To what extent could in-class activities be completed equally well by online and on campus students?

To what extent did teaching staff engage equally with online and on-campus students?

To what extent has the flexibility to attend online or in-person supported your learning?

Figure 1. A breakdown of the data collected divided by Moodle resources and activities (independent variables), and Module Evaluation Survey questions (dependent variables)

Variable Transformations

Recoding (into different variables)

From 'Scale' to 'Binary' (Nominal)

New: Learning Resources: Moodle Binary

Old: Learning resources: How well do resources in Moodle support your learning on 100-99.9 --> 1 (i.e., 'Yes'); 99.8-0 --> 0 (i.e., 'No')

From 'Scale' to 'Ordinal'

New: Learning Resources: Moodle Ordinal

Old: Learning resources: How well do resources in Moodle support your learning on 100-75.1 --> 1; 75-50.1 --> 2; 50-25.1 --> 3; 25-0 --> 4

Computing

Model with seven (7) 'groups'.

Group 1: AnyPreForum

Description: Any Pre-sessional Moodle Activity plus Teams Class

ANY('Yes',ClassForum, TeamsClass, QampAForum, CWForum, IntrosForumpre, TopicDiscussionForumpre)

Group 2: OUPre

Description: Any Pre-sessional Moodle OU Activity

ANY('Yes',OUBlog,OUWikipre)

Group 3: AnyBoardPre

Description: Any Pre-sessional 'board' / canvas Activity

ANY('Yes',MiroBoard,MoodleBoardpre,Padletpre)

Group 4: AnyQuestionnairePre

Description: Any Pre-sessional Moodle Questionnaire plus external questionnaire Activity

ANY('Yes',SelfevaluationQuestionnairepre,MoodleQuestionnairepre,ExternalQuestionnairepre)

Group 5: OtherPre

Description: Any remaining Pre-sessional – 13 Recordingspre, 17 MoodleFeedbackpre and 21 MoodleChoicepre

ANY('Yes', Recordingspre, MoodleFeedbackpre, MoodleChoicepre)

Live Session variables (summary)

Group 6: LiveQandAForumlive

Post-Sessional variables (summary)

Group 7: AllPost

Description: All Post-session variables as listed above.

ANY('Yes',DiscussionForumpost, MoodleQuizpost,

H5PTtestpost, MoodleFeedbackpost, MoodleQuestionnairepost, MoodleChatpost, MoodleBoardpost, IndependentResearchpost, Glossarypost, Homeworkviaemailpost)

Third model with five (5) types.

Type 1: ForumALL

Description: ALL Forum-related activities (including TeamsClass)

ANY('Yes', ClassForum, TeamsClass, QampAForum, CWForum, IntrosForumpre, TopicDiscussionForumpre, LiveQandAForumlive, DiscussionForumpost)

Type 2: OUandChatALL

Description: ALL forum-like activities (not included in ForumALL)

ANY('Yes', OUBlog, OUWikipre, MoodleChatpost)

Type 3: BoardALL

Description: ALL board-related activities

ANY('Yes', MiroBoard, MoodleBoardpre, Padletpre, MoodleBoardpost)

Type 4: AssessALL

Description: ALL questionnaire-related activities (including quizzes, tests i.e., assessment type of activities)

ANY('Yes', SelfevaluationQuestionnairepre, MoodleQuestionnairepre, ExternalQuestionnairepre, MoodleQuizpost, H5PTtestpost, MoodleQuestionnairepost)

Type 5: OtherALL

Figure 2. Computing and recoding of variables

As a descriptive study, observational data techniques from the scientific domain³⁶ are used to complement traditional univariate statistical methods. This is helping mitigate the “noticeable change in variance and standard deviation”³⁷ when working with small samples, which typically leads to non-significant results for inferential statistics – even though this must be treated with caution³⁸ as well.

As an explanatory study, a range of regression techniques – ordinal, logistic, linear, and partial least squares³⁹ – are applied to the data to attempt to evaluate any directional effect from designing or adapting Moodle resources and activities for HyFlex to ‘How well do resources in Moodle support your learning on this module?’. R-Squared⁴⁰ and pseudo-R Squared⁴¹ coefficients are used to assess the regression models together with other recognised measures for goodness-of-fit.

Research Ethics and Limitations

The issue of ethics for educational data mining⁴² brings up concerns about what learning analytics are used for especially in relation to how data are collected, analysed, and managed.⁴³ In the context of this research, the critical element of de-identification of data⁴⁴ is not quite relevant as (1) Moodle activities and resources are studied, and (2) no direct attribution of interactions to individuals is made at any point.

Nevertheless, the researchers obtained ethical approval. The Birkbeck Ethics Committee agreed that contacting all Module Conveners and providing them with the opportunity not to contribute data from their Moodle courses for analysis (opt-out) was sufficient for the purposes of this project. At the same time, everyone was asked whether they would be willing to participate in a follow-up case study.

Findings

Descriptive Statistics

Data from asynchronous, ‘interactive’ Moodle resources and activities are described, presenting frequency of usage and other general characteristics and possibly patterns. This is done both in relation to whether, or not, they are deployed, and in terms of how many times lecturers and students engage with them. Then selected data from the Module Evaluation Surveys is briefly summarised to identify specific aspects of the student experience.

Of the 28 ‘interactive’ Moodle resources and activities, seven (7) are not employed at all in the 37 modules included in the analysis, eight (8) are only employed once, six (6) are employed twice, and four (4) are employed three times. Of the remaining three, ‘ClassForum’ is present in 27 modules, ‘Recordingspre’ is found in 20, and ‘DiscussionForumpost’ appears in 7.

All frequency distributions but one (see Table 1) are positively skewed indicating a generally low usage. For instance, MoodleChoicepre’ is found once and used six times, whereas ‘ClassForum’, although is used 2.32 times on average, is typically interacted with once. ‘Recordingspre’ I.e., pre-recorded instructional material substituting or complementing traditional lectures is a recommended activity, yet it is used in 22 Moodle courses and only 15 times for the full duration of a term ($K = -1.878$).

Class	Teams Class	Q&A Forum	CW Forum	OU Blog	Miro Board	Intros
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	Forum						Forum (pre)
N	Valid	37	37	37	37	37	37
	Missing	0	0	0	0	0	0
Mean		2.32	0.05	0.30	0.73	1.03	0.54
Median		1.00	0.00	0.00	0.00	0.00	0.00
Mode		1	0	0	0	0	0
Std. Deviation		4.559	0.229	1.488	3.124	6.247	2.181
Skewness		3.408	4.113	5.871	4.681	6.083	4.096
Std. Error of Skewness		0.388	0.388	0.388	0.388	0.388	0.388
Kurtosis		11.840	15.767	35.119	22.501	37.000	15.791
Std. Error of Kurtosis		0.759	0.759	0.759	0.759	0.759	0.759
Range		22	1	9	17	38	10
Minimum		0	0	0	0	0	0
Maximum		22	1	9	17	38	10

	Recordings (pre)	Topic Discussion Forum (pre)	Self-evaluation Questionnaire (pre)	Moodle Questionnaire (pre)	Moodle Feedback (pre)	External Questionnaire (pre)	OU Wiki (pre)
N	Valid	37	37	37	37	37	37
	Missing	0	0	0	0	0	0
Mean		5.35	1.35	0.00	0.70	0.00	0.03
Median		7.00	0.00	0.00	0.00	0.00	0.00
Mode		0	0	0	0	0	0
Std. Deviation		4.739	4.449	0.000	2.515	0.000	0.164
Skewness		-0.141	3.866		3.623		6.083
Std. Error of Skewness		0.388	0.388	0.388	0.388	0.388	0.388
Kurtosis		-1.878	16.247		12.369		37.000
Std. Error of Kurtosis		0.759	0.759	0.759	0.759	0.759	0.759
Range		11	23	0	11	0	1
Minimum		0	0	0	0	0	0
Maximum		11	23	0	11	0	1

	Moodle Board (pre)	Moodle Choice (pre)	Padlet (pre)	Live Q&A Forum (live)	Discussion Forum (post)	Moodle Quiz (post)	H5P Test (post)
N	Valid	37	37	37	37	37	37
	Missing	0	0	0	0	0	0
Mean		0.92	0.16	0.14	0.03	6.97	0.03
Median		0.00	0.00	0.00	0.00	0.00	0.00
Mode		0	0	0	0	0	0
Std. Deviation		4.681	0.986	0.822	0.164	23.435	0.164
Skewness		5.717	6.083	6.083	6.083	3.838	6.083
Std. Error of Skewness		0.388	0.388	0.388	0.388	0.388	0.388
Kurtosis		33.552	37.000	37.000	37.000	14.186	37.000
Std. Error of Kurtosis		0.759	0.759	0.759	0.759	0.759	0.759

Kurtosis							
Range	28	6	5	1	107	1	0
Minimum	0	0	0	0	0	0	0
Maximum	28	6	5	1	107	1	0

	Moodle Feedback (post)	Moodle Questionnaire (post)	Moodle Chat (post)	Moodle Board (post)	Independent Research (post)	Glossary (post)	Homework via email (post)
N Valid	37	37	37	37	37	37	37
Missing	0	0	0	0	0	0	0
Mean	0.03	0.11	0.46	0.03	0.00	0.86	0.00
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mode	0	0	0	0	0	0	0
Std. Deviation	0.164	0.658	2.795	0.164	0.000	5.094	0.000
Skewness	6.083	6.083	6.083	6.083		6.073	
Std. Error of Skewness	0.388	0.388	0.388	0.388	0.388	0.388	0.388
Kurtosis	37.000	37.000	37.000	37.000		36.916	
Std. Error of Kurtosis	0.759	0.759	0.759	0.759	0.759	0.759	0.759
Range	1	4	17	1	0	31	0
Minimum	0	0	0	0	0	0	0
Maximum	1	4	17	1	0	31	0

Table 1. Descriptive Statistics

Inferential Statistics

Four different approaches to regressions analysis are presented: Ordinal, logistic (binary), linear, and Partial Least Squares (PLS).

Ordinal Regression

28 ‘interactive’ resources and activities are used as the independent variables to examine the hypothesised relationship of causality with the dependent variable, ‘How well do resources in Moodle support your learning on this module?’, recoded in quartiles (as the original data was collected as a continuous variable with values between 0% and 100%).

This model (see Table 2) does not provide a statistically significant improvement over the intercept only model with $\chi^2 = 12.517$ (df = 16) and $p = 0.708$. This is reflecting the extremely high number (41 or 65.1%) of empty cells in the data. The pseudo- R^2 measures are hard to interpret because of potential overfitting, sparse categories, or separation⁴⁵. A possible solution is to scale the model back by transforming the predictors to reduce sparsity in the data (and standard errors as a result).

Two options are considered: A model with seven independent variables computed to group relevant pre, live, and post ‘interactive’ resources and activities. This provides no additional explanatory power with roughly the same statistics ($\chi^2 = 5.274$ with df = 7, $p = 0.627$) and, if anything, smaller pseudo- R^2 measures, which also remain unreliable.

The next model with five independent variables computed by ‘interactive’ resource and activity type presents the same issues ($\chi^2 = 7.712$ with df = 5, $p = 0.173$) as significance is still not close to the accepted standard I.e., $p \leq 0.05$.

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	14.442			
Final	1.924	12.517	16	0.708

Link function: Logit.

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	0.038	24	1.000
Deviance	0.075	24	1.000

Link function: Logit.

Pseudo R-Square

Cox and Snell	0.287
Nagelkerke	0.735
McFadden	0.683

Link function: Logit.

Table 2. Ordinal Regression (original model)

Logistic Regression

Three similar models are tested by substituting the ordinal dependent variable with a binary one. For the model with 28 independent variables, non-significant Omnibus test of coefficients ($\chi^2 = 19.402$, $df = 16$, $p = 0.248$) and a failed convergence suggest that the fitted model is unstable I.e., does not have statistically reliable explanatory power. There is no improvement in both the model with seven (see Table 3) computed independent variables ($\chi^2 = 7.125$, $df = 7$, $p = 0.416$) - this is actually much worse - and in the one with five computed independent variables by type ($\chi^2 = 6.311$, $df = 5$, $p = 0.277$).

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	7.125	7	0.416
	Block	7.125	7	0.416
	Model	7.125	7	0.416

Model Summary

Step	-2 Log likelihood	Cox & Snell Square	R Nagelkerke Square	R
1	37.908 ^a	0.175	0.249	

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	0.988	5	0.964

Table 3. Logistic Regression (seven groups)

Linear Regression

This is based on data about the frequency of usage for ‘interactive’ activities and resources in Moodle. Approaching the analysis using 28 predictors appears to give a reasonable fit ($R^2 \approx 0.808$; Adjusted $R^2 \approx 0.635$; Durbin–Watson ≈ 1.90); however, the sizable drop from R^2 to Adjusted R^2 and the high complexity relative to number of cases ($N = 37$ with ANOVA $df = 17$ and residual $df = 19$) suggest both potential overfitting and instability. Also: Even though the model is statistically significant (ANOVA $p < 0.001$), several predictors display extreme collinearity with unstable coefficients and non-dependable individual effect estimates due to high Variance Inflation Factors (VIFs).

After computing to group relevant pre, live, and post ‘interactive’ resources and activities, there is a marked drop in the explanatory power ($R^2 \approx .077$; Adjusted $R^2 \approx -.146$; Durbin–Watson ≈ 2.01) of the resulting model: the negative Adjusted R^2 indicates that the model fit is worse than a mean-only model. The model is not statistically significant (ANOVA $p = 0.926$, $df = 7$), and the Condition Indices show a shared dependency for three of the six computed variables as well as ‘Live Q&A Forum (live)’.

Similar results are found when using the five computed predictors by type (see Table 4): This specification is weak ($R^2 \approx .112$; Adjusted $R^2 \approx -.031$; Durbin–Watson ≈ 2.00) and statistically non-significant (ANOVA $p = 0.571$, $df = 5$). There is also moderate to very high collinearity for all but one of the independent variables as well as clustered variance proportions, which make replicability hard, too.

Model Summary

Model	R	R Square	Adjusted Square	Std. Error of the Estimate	Durbin-Watson
1	.334 ^a	0.112	-0.031	10.7739	2.004

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	453.232	5	90.646	0.781	.571 ^b
	Residual	3598.384	31	116.077		
	Total	4051.616	36			

Coefficients

Model		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		Beta			Tolerance	VIF
1	(Constant)		31.127	0.000		
	ForumALL	-0.003	-0.018	0.986	0.879	1.138
	OUandChatALL	-0.404	-1.187	0.244	0.247	4.056
	BoardALL	-0.373	-1.083	0.287	0.242	4.139
	AssessALL	0.589	1.417	0.166	0.166	6.029
	OtherALL	-0.205	-0.653	0.518	0.291	3.440

Collinearity Diagnostics

Model		Eigenvalue	Condition Index
1	1	2.930	1.000
	2	1.292	1.506
	3	0.933	1.773
	4	0.659	2.109
	5	0.101	5.393
	6	0.085	5.872

Table 4. Linear Regression (five types)

Partial Least Squares (PLS)

The general instability of the above regression models leads to the application of Partial Least Squares (PLS) to try and resolve issues with the limited amount of data available, the extensive number of variables, and the fact that said variables are intertwined.

The “best” fit model includes three latent factors as they offer highest Adjusted $R^2 \approx 0.750$, strong cumulative Y-variance with minimal added complexity $\approx 77.1\%$, and cumulative X variance $\approx 54.0\%$ (see Table 5). Beyond this point the Adjusted R^2 slips back to ≈ 0.676 at factor 14 and, eventually, to ≈ 0.635 at factor 17: There are diminishing returns and a higher risk of over-fitting for this sample size ($N = 37$), as reported previously.

This model’s predictive power stems from post ‘interactive’ resources and activities in Moodle, especially with ‘MoodleChatpost’ adding further value - note that ‘MoodleBoardpost’,

‘MoodleFeedbackpost’ and ‘Glossarypost’ are key levers (together with ‘OUWikipre’ and ‘Padletpre’) for Latent Factor 1, whereas Latent Factors 2 and 3 reinforce ‘MoodleBoardpost’, ‘MoodleFeedbackpost’ with ‘MoodleChatpost’.

Proportion of Variance Explained

Latent Factors	Statistics				
	X Variance	Cumulative Variance	X Y Variance	Cumulative Variance (R-square)	Adjusted R-square
1	0.237	0.237	0.389	0.389	0.372
2	0.147	0.384	0.343	0.733	0.717
3	0.156	0.540	0.039	0.771	0.750
4	0.061	0.600	0.006	0.777	0.749
5	0.052	0.653	0.002	0.779	0.743
...					
17	0.047	1.000	1.378E-12	0.808	0.635

Table 5. Partial Least Squares (PLS)

Discussion

Despite the prominence of forums, there was little interaction between students. When reviewing the instructions, they did not explicitly ask students to respond to other contributions, nor did lecturers respond to student contributions. In one module evaluation form, a student commented on the lack of lecturer response and that the forum responses were not referred to in class.

There was also a lack of information about the nature of HyFlex teaching and learning on the Moodle pages, although this does not mean it was not discussed in class. A thorough orientation is important as it cannot be assumed students are aware of, or understand, the nature of HyFlex teaching and learning.

The development programme did not have the impact we expected, as there was a general lack of Moodle development for all modules in the pilot, not just the 37 that were analysed. However, this did not seem to impact module satisfaction, as measured on the module evaluation surveys. It may be that students have different expectations for their Moodle pages and what is considered key for supporting their learning.

The sample available led to what could be regarded as incomplete observations. The limited uptake of interactive resources and activities in the pilot modules made the tested models overspecified: They eventually included a number of redundant independent variables, which made predictions unreliable (even with transformations).

The final attempt to resolve this impasse with Partial Least Square (PLS) regression brought up another confusing aspect in the analysis. Post-session resources and activities seemed to have the potential to produce a sizeable, positive impact on student satisfaction, even though they were rarely deployed in the pilot Moodle courses and barely interacted with during terms.

It perhaps is a case of understanding how offering opportunities for students to consolidate their knowledge becomes a critical factor in the success of HyFlex teaching and learning in the context of active blended learning and flipped classrooms.

Next steps and conclusion

The Adapt/Design for HyFlex session does not focus on asynchronous activities, as the intention is to develop an activity that can be practiced in the HyFlex Practice session. We need to be clear that having pedagogically supportive asynchronous activities in Moodle supports HyFlex teaching. American universities that offer an asynchronous-only component to their HyFlex courses prioritise these activities, so it is possible that there is an overreliance on live sessions at Birkbeck. Adapt/Design for HyFlex already covers several learning outcomes, so we are considering developing a fourth component to the development programme which focuses on advanced course design, specifically asynchronous activities. This will tie in with the training already provided by Birkbeck's Digital Education team on the suite of tools available, such as Miro, Mentimeter, and H5P.

We would like to continue the research by conducting case studies with lecturers whose modules were part of this analysis, particularly those who are not currently utilising many asynchronous activities. In addition, we would like to conduct wider consultations with academics who participated in the 24/25 pilot to continue developing the HyFlex Development programme provision, and to assist in the development of the more advanced course design component. This will ensure the suggested ways of incorporating asynchronous activities are pedagogically appropriate for the different schools at Birkbeck.

NOTES

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BRIDGING MARGINALIZED HISTORIES AND DIGITAL STORYTELLING: STUDENT-CENTERED LEARNING THROUGH HARTFORD'S ANCIENT BURYING GROUND

Author:

BETHANY M WADE

Affiliation:

SACRED HEART UNIVERSITY, UNITED STATES

INTRODUCTION: FROM CLASSROOM TO COUNTER-NARRATIVE—A FRAMEWORK FOR CRITICAL PUBLIC HISTORY PEDAGOGY

In recent years, there has been a growing call for academic work—especially in the humanities—to move beyond the classroom and engage more directly with the ‘real world.’ For those of us who teach history, this call is not simply about public engagement; it is about equipping students with the tools to recognize, understand, and challenge the forms of exclusion that shape both the past and their present.

This pedagogical imperative aligns with scholarship in critical public history, which contends that history is not merely recorded but actively produced through power. The archive itself is an artifact of power, full of gaps and silences that disproportionately affect marginalized communities.¹ Teaching students to navigate these silences is not just a technical skill but an ethical and political act. This paper posits that digital storytelling, when grounded in this critical framework, can function as a form of “counter-monument”—a disruptive intervention that challenges official memory and makes absences visible.²

The project discussed in this article is part of my course *From Mummies to Morgues: Burial Practices in Global Context*. In this project, students work with a database documenting Afro-descended and Indigenous individuals buried in Hartford’s Ancient Burying Ground, established in the 1640s. This database becomes an entry point for exploring how historical narratives are constructed, whose stories have been preserved, and whose have been neglected. Through this work, students confront real-world issues—historical exclusion, systemic inequality, and the lasting implications of archival silence—while learning concrete research and digital storytelling skills.

My approach is grounded in a critical digital pedagogy that emphasizes student agency and the construction of knowledge.³ The project is designed as a experiential learning cycle, moving from abstract conceptualization (historical theory), to concrete experience (site visit) and reflective observation, and active experimentation (digital creation).⁴ My aim in designing this project was to create a student-centered framework that develops historical expertise alongside practical, transferable competencies. Using ArcGIS StoryMaps, students build digital projects that combine spatial analysis, archival research, and narrative construction. In doing so, they take ownership of recovering voices that have been absent from local public memory. Their work becomes an act of public history: a way

of returning visibility to individuals who have been omitted from both the written record and the physical landscape of Connecticut.⁵

Tracing the pedagogical strategies of this approach—from scaffolded assignments and primary-source investigation to digital tool integration—this article proceeds in four stages. First, I detail the project's scaffolded design, illustrating how it builds disciplinary and technical skills while introducing the core theoretical concepts of silence and erasure. Second, I analyze the pivotal experiential moment of the site visit, framing it as a critical pedagogy of discomfort that transforms abstract understanding into embodied realization.⁶ Third, I examine the synthesis phase of digital counter-monument creation, where students mobilize their learning to produce public-facing scholarship.⁷ Finally, I reflect on the challenges of teaching marginalized histories to students with diverse backgrounds and skill levels, alongside the broader implications of this model for the public humanities. Ultimately, I argue that bridging historical research, digital technologies, and local context creates a powerful teaching model—one that meets students where they are, responds to their learning needs, and contributes meaningfully to the public understanding of underrepresented histories.

BUILDING THE FOUNDATION: SCAFFOLDING HISTORICAL CONSCIOUSNESS AND TECHNICAL SKILLS

This section outlines the initial pedagogical phase, designed to build a shared historical consciousness about systemic exclusion while incrementally developing the research and technical competencies necessary for the final project. Scaffolding is essential not only for skill acquisition but for safely and ethically guiding students into emotionally and intellectually challenging material.

As part of my course *From Mummies to Morgues: Burial Practices in Global Context*, undergraduate students engage with a database documenting Afro-descended and Indigenous individuals buried in Hartford's Ancient Burying Ground (established c. 1640). Through this work, students connect historical research with digital storytelling to challenge erasure and make history relevant to their contemporary world.

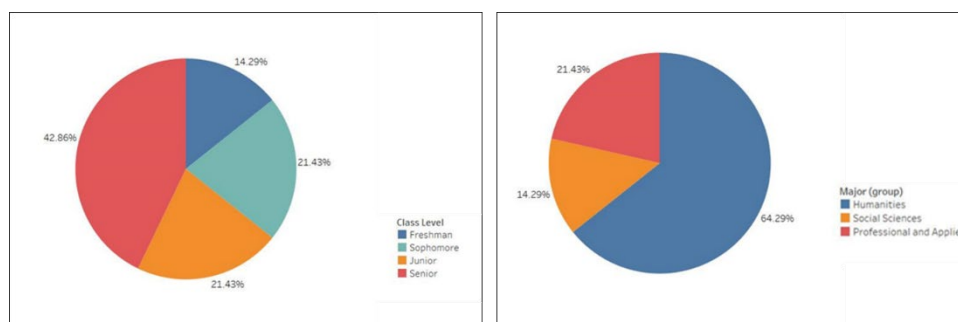


Figure 6. The cohort represented a high degree of variability in both disciplinary background and academic experience, necessitating a design that provided multiple points of entry into the project.

This class runs as an upper-level history course, but as a smaller department at a smaller institution, our classes include students with a wide range of backgrounds and experiences. In this group of thirty students—first-years through seniors, majors and non-majors—I needed to account for very different levels of preparation. My teaching is grounded in an interdisciplinary approach, so I focused on meeting students where they were, paying close attention to their existing skills, and adjusting the course as needed to keep everyone moving forward.

This aligns with a differentiated instruction and universal design for learning (UDL) approach, which plans for variability in student background and aptitude.⁸ The iterative, phased structure of the project is a direct application of these principles.

To support this range of learners, the project had to be scaffolded. Many humanities students needed to build technical confidence, while non-history students needed more guidance in developing research skills. The best way to balance these needs was through an iterative structure. The sixteen-week project unfolded in phases, each step building toward the next.

Key Points to Remember:

- **Iterative Process:** Your project will evolve over time. Each phase helps build your final StoryMap, so don't worry about having it perfect at the start.
- **Focus on Storytelling:** You're telling a story about the past, using data, maps, and visuals to make it engaging and meaningful.
- **Continuous Feedback:** You'll get feedback from peers and your instructor throughout the project. Use this to refine and improve your work.
- **Historical Connection:** As you develop your narrative, think about how the individual story connects to bigger historical themes like race, identity, and community.

By the end of the project, you'll have a dynamic digital narrative that combines historical research with digital storytelling techniques, allowing you to present the lives and experiences of people in the past in an engaging and informative way.

Figure 7. This excerpt from student project guidelines outlines the project's iterative nature designed to build technical competency and historical empathy through repeated reflection and revision.

The foundational work happened in the first weeks of the course. Students were introduced to essays on how cemeteries across the United States have long been divided along racial, ethnic, religious, and class lines.⁹ These readings served as the initial foundation, introducing students to the concept of the spatial politics of memory. They began to see burial grounds not as neutral landscapes but as power-lived spaces where social hierarchies are inscribed and contested, even in death.¹⁰ For many students, while they had learned about slavery, racism, and prejudice in American history, the stories of exclusion in death and burial struck a particular nerve. Many discussions in this early phase involved coming to grips with these realities.

This moment of affective engagement is crucial. Following scholars of emotion and pedagogy, I view this discomfort not as a problem to be avoided but as a site for transformative learning.¹¹ The subsequent reflective assignment formally initiated an ethics of care and responsible representation that would guide their work.

Introduction to the Database & Ethics of Representation

Next we turned to the database at the core of their projects. The database compiles all known African, African-American, and Indigenous individuals buried in Hartford's Ancient Burying Ground between 1640 and 1815. It presents searchable profiles, historical context, and a downloadable dataset. It serves as a key resource for recovering marginalized histories at Hartford's oldest surviving historic site.

After a workshop on navigating the database, students selected an individual or family to study. By focusing on individuals rather than statistical patterns, curiosity was stirred about the lived experience of these figures. Because they 'found' them in the records, I was surprised by the emotional connection students felt for the people they were centering their stories around. This shift from aggregate data to individual biography is a deliberate methodological choice, drawing on microhistory and the feminist historical practice of recovery.¹² It personalizes the archival silence, making the abstract concept of erasure palpably felt.

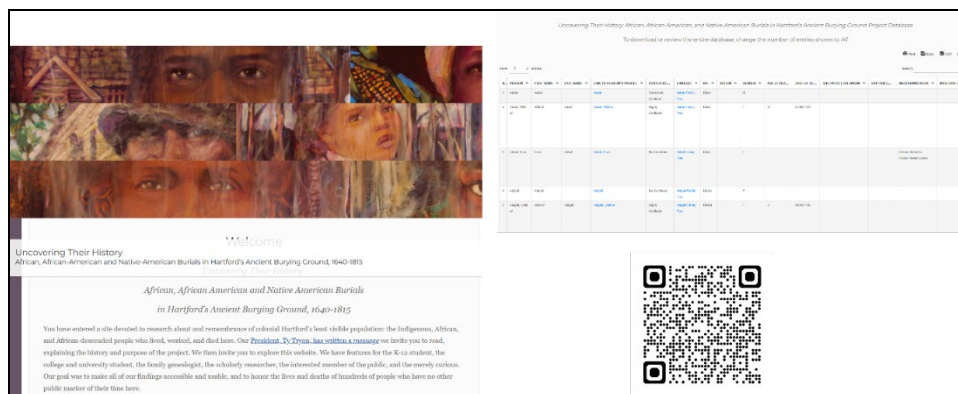


Figure 8. The Database (<https://www.africannativeburialsct.org/>) provides searchable records and biographical details for the Afro-descended and Indigenous individuals interred in Hartford's Ancient Burying Ground.

In this early phase, we focused on the ethics of this work. Teaching marginalized histories—especially those involving historical trauma—requires sensitivity. Here, we explicitly named the concept of archival silence.¹³ Students were tasked not just with finding information, but with documenting the absence. Their research plans had to account for what was not there and hypothesize why, moving them from fact-finding to historical critique.

CONFRONTING THE SILENCE: PRIMARY SOURCES AND THE EMBODIED REALIZATION OF ERASURE

Armed with ethical guidelines and a biographical focus, students then directly engaged the fragmentary archive. This phase operationalizes the theoretical concept of silence, transforming it into a concrete research problem. This project centered on the direct integration of primary source data. Working with the database forced students to confront gaps, silences, and biases in the archival record. It is a deeply confrontational encounter that connects historical research to inequality.

My role here shifted to that of a guided inquiry facilitator. Rather than providing answers, I posed framing questions: “What does this record assume? What vocabulary does it use? What is missing from its categories?” This develops students’ historical thinking skills, specifically their capacity for sourcing and corroboration.¹⁴

This phase made real the gaps in the historical record. Students were thinking of their cases as people, not abstractions, and were eager to fill in the rest of each individual’s life. Early research revealed a scarcity of information, challenging the assumption that a simple search would yield a wealth of detail. This introduced a foundational lesson in how historical records function.

For example, one student researching a Black woman executed after a sexual assault found her case in legal histories. For many other subjects, however, the burial dataset was the only surviving record. Collectively, this scarcity prompted essential discussions on how to contextualize the lives and deaths of Black and Indigenous people in Hartford.

This intellectual confrontation with absence set the stage for the more visceral, embodied confrontation to come. The digital tool training in the subsequent phase was thus framed not as a technical add-on, but as the means to remediate this silence—to give form to the fragments they had gathered.¹⁵

THE DIGITAL TURN: STORYMAPS AS A PLATFORM FOR SYNTHESIS AND SPATIAL ARGUMENT

The shift to ArcGIS StoryMaps is theorized as a move from analysis to synthesis and public argument. Digital storytelling is a mode of spatial humanities scholarship that allows students to construct arguments where geography, narrative, and evidence intersect.¹⁶

I chose StoryMaps because it allows students to combine interactive maps with images, text, and other media to tell a more engaging, location-based story. In this project, it helped bring the histories of individuals buried in Hartford's Ancient Burying Ground to life, showing not only where they were buried but mapping their life stories. StoryMaps also forced the integration of spatial thinking. Students had to ask: Where was this person born? How did they arrive in Hartford? Where did this person live and where were they buried? Moreseo, it asks students to connect this movement shows patterns of broader historical geography.

The StoryMaps workshops employed a studio model adapted from design pedagogy to foster collaborative learning. Students began with a technical introduction, then created draft layouts with text and image placeholders. Peer review sessions were structured using critical friendship protocols to ensure feedback remained constructive and focused on the historical argument as expressed through digital means.¹⁷

Subsequent workshops focused on advancing skills through iterative drafts. Students learned to find and integrate visual elements—including historical images and contemporary media—and to create small, geocoded databases from their research to build custom interactive maps.

This phase emphasized structure and process. Shifting from a traditional term paper to digital storytelling transformed the student dynamic. The project's focus on narrative building moved students from passive consumers of history into active historical agents. They gained ownership over a genuinely underrepresented story, positioning them to directly challenge the historical erasure identified at the start of the course.

THE PIVOT POINT: THE SITE VISIT AS CRITICAL PEDAGOGY OF DISCOMFORT

The site visit forms the experiential core of the learning cycle, applying a critical pedagogy of discomfort. After students completed archival research and learned the digital tool, we conducted a full-day visit to the Ancient Burying Ground and Nutmeg Pulpit exhibit in Hartford. This was not a celebratory field trip; it was an integral research lab for their digital work. Pedagogically, I chose not to pre-brief students on the site's condition. They arrived knowing the lives of the Black and Indigenous individuals they studied, but not what the cemetery looked like. This created a structured “rupture” in their expectations, forcing a direct, sensory engagement with the materiality of erasure.¹⁸

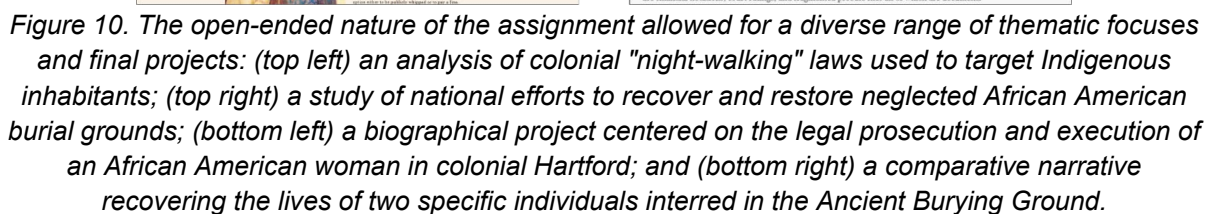


Figure 9. The site visit allows students to engage directly with the physical landscape of the colonial site, bridging the gap between abstract archival data and the material reality of historical erasure. Photograph by the author.

By this point, students felt connected—personally and intellectually—to their subjects. Many were anticipating finding the grave or headstone of their study individual. The result was a powerful shock. They saw towering cenotaphs for Hartford's founding fathers and headstones of prominent colonists, yet found nothing for the people they researched. Later, as we navigated downtown Hartford, students

This moment transformed the theoretical concept of “silence” into a tangible reality. Students moved from understanding erasure cognitively to feeling it emotionally and witnessing it physically. This embodied knowledge became the driving motivation for the final phase of their projects, fulfilling the “active experimentation” stage of the experiential cycle.

In this final phase, students' work coalesced into a digital counter-monument. Students returned with a new mission: to bridge the archive and the site using their StoryMap. In the final weeks, they combined their research with evidence from the visit. The digital project became a counter-monument—a space to restore the visibility denied by the physical landscape. The site visit provided the proof of erasure, and the StoryMap became the remedy.



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Taken together, the project's outcomes invite a closer examination of its impact, the constraints that shaped its execution, and what these experiences suggest for the public humanities more broadly.

Student Impact & Relevance

The impact of this project on student learning was significant. Instead of passively analyzing historical texts, students actively challenged erasure. Their work illuminated how historical exclusion and disenfranchisement are root causes of modern systemic inequality. The project shifted their perspective: history is not just a list of dates; it is a process of recovery with ethical and civic stakes.

The Practical Skills Mastery

Beyond academic content, this project developed transferrable skills. Students gained literacy in digital tools, data visualization, and professional narrative sequencing. In the final refinement phases, they collected and curated visuals, troubleshooted technical issues, and applied peer and instructor feedback—skills vital for the contemporary job market. This aligns with core competencies of the digital and public humanities, where the ability to translate archival research into accessible, multimodal public scholarship is paramount. The project reframes technical training as an integral component of modern humanistic practice, preparing students to be effective stewards and communicators of history in a digital age.

Challenges and Opportunities

There were challenges. While the pedagogical outcome was excellent, the project required navigating complex logistics, such as securing transportation—a cost barrier for many similar projects. This points to a larger institutional challenge: there is often no centralized, step-by-step guide for high-impact, site-based learning in the humanities. These logistical hurdles are institutional barriers. Framing them clearly creates an opportunity to advocate for structural support—such as dedicated grants for community-engaged learning or streamlined administrative protocols—to make this model repeatable and sustainable for other faculty.

Scalability and Scope

Finally, we must address the challenge of scalability. This project succeeded because of its manageable scope—28 students and a high-touch mentorship model. Scaling this kind of deep, "slow history" to a large survey course would be difficult without significant teaching support or a simplified digital framework. The intensity of guiding students through both emotional archival work and technical digital production raises questions about how we can democratize this level of engaged learning without risking faculty burnout. This challenge connects to debates about the "slow humanities," which champion depth and mentorship over scale and efficiency. Rather than diluting the model for mass delivery, a more sustainable path may involve collaborative structures like team-teaching with digital scholarship librarians or establishing partnerships with public history sites, where community experts share the pedagogical load and enrich the learning ecosystem.

CONCLUSION: WRITING HISTORY BACK INTO EXISTENCE

This pedagogical model demonstrates that the response to archival and physical erasure is not merely additive—placing more names in a database—but reconstructive and interventionist. By theoretically framing silence, methodologically scaffolding its investigation, and pedagogically creating a space for digital remediation, we empower students to become producers of critical public knowledge.

This project exemplifies how the humanities can use "real-world" problems—like historical erasure—to define teaching, learning, and research agendas. By bridging historical research, digital technologies, and community engagement, we equip students with the skills and ethical framework to

engage in civic action and contribute meaningfully to the public understanding of underrepresented histories. We aren't just teaching them history; we are teaching them how to write it back into existence

NOTES

¹ For discussions of how historical narratives are produced through power and how archival silences structure what can be known, see: Rodney G. S. Carter, "Of Things Said and Unsaid: Power, Archival Silences, and Power in Silence," *Archivaria* 61 (2006): 215–233, <https://archivaria.ca/index.php/archivaria/article/view/12541>; Saidiya Hartman, *Wayward Lives, Beautiful Experiments: Intimate Histories of Riotous Black Girls, Troublesome Women, and Queer Radicals* (New York: W. W. Norton & Company, 2019); Michel-Rolph Trouillot, *Silencing the Past: Power and the Production of History* (Boston: Beacon Press, 1995);

² On counter-monuments and other practices that refuse monumental permanence in favor of disruption, absence, and critique, see: Despina Petousi, et al., "Role-Playing Games as Hybrid Museum Kits Promoting Historical Understanding and Meaning Making," in *AVI-CH 2022 Workshop on Advanced Visual Interfaces for Cultural Heritage* (New York: ACM, 2022), 1–7; Quentin Stevens, Karen A. Franck, and Ruth Fazakerley, "Counter-Monuments: The Anti-Monumental and the Dialogic," *Journal of Architecture* 23, no. 5 (2018): 718–39, <https://doi.org/10.1080/13602365.2018.1495914>; James E. Young, "The Counter-Monument: Memory against Itself in Germany Today," *Critical Inquiry* 18, no. 2 (1992): 267–96, <https://www.jstor.org/stable/1343784>.

³ Jesse Stommel, "Critical Digital Pedagogy: A Definition," *Hybrid Pedagogy*, November 2014, <https://hybridpedagogy.org/critical-digital-pedagogy-definition/>.

⁴ David A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (Englewood Cliffs, NJ: Prentice Hall, 1984), 49–52.

⁵ Leslie Bedford, "Storytelling: The Real Work of Museums," *Curator: The Museum Journal* 44, no. 1 (2001): 30–31, <https://doi.org/10.1111/j.2151-6952.2001.tb00027.x>; Sarah McKinney, et al., "Developing Digital Archaeology for Young People: A Model for Fostering Empathy and Dialogue in Formal and Informal Learning Environments," in *Communicating the Past in the Digital Age* (London: Ubiquity Press, 2020), 2–9, <https://doi.org/10.5334/bch.n>.

⁶ Megan Boler, *Feeling Power: Emotions and Education* (New York: Routledge, 1999), 176–178.

⁷ Bernard R. Robin, "Digital Storytelling: A Powerful Technology Tool for the Twenty-First Century Classroom," *Theory Into Practice* 47, no. 3 (2008): 224–225, <https://doi.org/10.1080/00405840802153916>.

⁸ For UDL approaches, see: Anne Meyer, David H. Rose, and David Gordon, *Universal Design for Learning: Theory and Practice* (Wakefield, MA: CAST Professional Publishing, 2014).

⁹ Allan Amanik and Kami Fletcher, eds., *Till Death Do Us Part: American Ethnic Cemeteries as Borders Uncrossed* (Jackson: University of Mississippi Press, 2020).

¹⁰ Henri Lefebvre, *The Production of Space*, trans. Donald Nicholson-Smith (Oxford: Blackwell, 1991), 128–130.

¹¹ Boler, *Feeling Power*, 183–186.

¹² See: Liv Egholm, Michael Heller, and Michael Rowlinson, "Reframing the Past: Microhistory's Analytical Promise for Management and Organizational History," *Management & Organizational History* 20, no. 4 (2025): 393–411, <https://doi.org/10.1080/17449359.2025.2576169>; Nel Noddings, *Caring: A Feminine Approach to Ethics and Moral Education* (Berkeley: University of California Press, 1984).

¹³ For a discussion of archival silences, see: Carter, "Of Things Said," 215–233.

¹⁴ Sam Wineburg, *Historical Thinking and Other Unnatural Acts: Charting the Future of Teaching the Past* (Philadelphia: Temple University Press, 2001), 63–88.

¹⁵ University of Houston College of Education, "Educational Uses of Digital Storytelling," accessed September 25, 2025, <https://digitalstorytelling.coe.uh.edu>.

¹⁶ For discussions of GIS and Digital storytelling, see: David J. Bodenhamer, John Corrigan, and Trevor M. Harris, eds., *The Spatial Humanities: GIS and the Future of Humanities Scholarship* (Bloomington: Indiana University Press, 2010); Angeliki Chrysanthi, et al., "Place-Based Digital Storytelling: The Interplay between Narrative Forms and the Cultural Heritage Space," in *Emerging Technologies and the Digital Transformation of Museums and Heritage Sites* (Cham: Springer, 2021), 127–138, https://doi.org/10.1007/978-3-030-76270-8_11; Vincenzo Lombardo and Rossana Damiano, "Storytelling on Mobile Devices for Cultural Heritage," *New Review of Hypermedia and Multimedia* 18, nos. 1–2 (2012): 1–21, <https://doi.org/10.1080/13614568.2012.617846>.

¹⁷ Arthur L. Costa and Bena Kallick, "Through the Lens of a Critical Friend," *Educational Leadership* 51, no. 2 (1993).

¹⁸ Jenny Kidd, "With New Eyes I See: Embodiment, Empathy and Silence in Digital Heritage Interpretation," *International Journal of Heritage Studies* 25, no. 1 (2019): 60–63, <https://doi.org/10.1080/13527258.2017.1341946>; Steve Poole, "Ghosts in the Garden: Locative Gameplay and Historical Interpretation from Below," *International Journal of Heritage Studies* 24, no. 3 (2018): 302–306, <https://doi.org/10.1080/13527258.2017.1347887>.

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MOVING OUTDOORS AND ACROSS BORDERS: WALKING AS CLIMATE PEDAGOGY

Author:

RACHEL EPP BULLER¹; SHEENA WILSON²; CAROLINE BOMFIM²

Affiliation:

BETHEL COLLEGE, UNITED STATES; UNIVERSITY OF ALBERTA, CANADA

INTRODUCTION

Walking has become central to our research and teaching commitments as a mode of outward-facing pedagogy, one that intentionally reaches beyond the academy to engage university students, City of Edmonton employees, community members, and retired seniors in interdisciplinary, intergenerational, and cross-cultural knowledge co-creation. This work takes place in the specific geographies where we live and collaborate: the lands of the Kanza, Kiowa, Osage, and Pawnee people in Kansas, USA, and the Treaty 6 territory, home to Cree, Saulteaux, Blackfoot, Métis, Nakota Sioux, Dene, and Inuit peoples, in Alberta, Canada. Across these locations, our project, *Walking the Talk: Climate Moves*, explores what becomes possible when climate learning is relocated outdoors, into embodied and relational practices that attend to land, place, and more-than-human kin.¹

Our collaboration emerged from the convergence of our disciplinary backgrounds – visual arts, cultural studies, climate communication, and media studies – and from a shared commitment to supporting individuals and communities in repairing and deepening their relationships to place and to one another. These relational foundations, we argue, are a necessary first step in climate action. In this sense, walking is not merely a means of transportation; it is a method that creates conditions for attunement, slowness, and threshold knowledge.² Drawing from interdisciplinary walking scholarship and Indigenous teachings,³ we understand duration and repetition, the act of returning to a place, again and again, as fundamental to how humans learn to perceive ecological changes, histories, and possibilities.⁴

The broader project operates across two mirror labs, one in Newton, Kansas and the other in Edmonton, Alberta. This research design borrows from soil science testing methods at Université Mohammed VI Polytechnique; this method acknowledges that different ecosystems, and, analogously different sociocultural contexts, respond differently when new elements are introduced. In Newton, work with undergraduate students and seniors revealed how weekly walking practices sharpen ecological attention, deepen sensory awareness, and build intergenerational community resilience. In Edmonton, our collaboration with municipal employees unfolds within a large public institution whose staff, aged approximately 25 to 65, hold significant leverage in shaping how a city plans, designs, and implements climate-related decisions. While busy professional lives can create barriers to participation, walking has proven to be both accessible and energizing (if undertaken during work hours), offering opportunities for colleagues to learn together in ways that depart from typical professional development.

Across both sites, our early findings suggest that walking cultivates forms of climate learning that are experiential, relational, and emotionally resonant. Participants consistently described feelings of calm, curiosity, and renewed connection to the lands they traverse daily. As municipalities like Edmonton strive to embed the workplace slogan that *every decision is a climate decision*, embodied pedagogies such as walking offer a quiet but powerful method for fostering climate awareness, relational connections, and a sense of shared responsibility.

Project Background and Pedagogical Commitments

This project is grounded in our longstanding commitment to mobilizing walking as a relational research method and interdisciplinary pedagogy capable of generating climate learning across diverse communities. We walked over the course of many months and in every season, layering knowledge onto the land as we walked with a range of participants, and with a variety of walk leaders, each of whom hold different expertise about the natural and built worlds that make up our local ecosystems. Participants shared experiential and professional expertise with one another, flattening the hierarchy. Keen to learn from other experts, all of our walk leaders joined as participants in walks led by others. The conversations and knowledge co-construction as we observed new phenomena resulting from climate change, and learned about the histories and ecologies of places, were dynamic. We recorded these conversations, conducted surveys, and followed up with participants, collating and sharing resources and information spontaneously arising out of the walks. Walking, as we practice it, is not conceived of simply as an extracurricular activity or a low-carbon mode of transport; rather, it is a rigorous method⁵ through which participants attune to lands, build relationships with one another and more-than-human kin, and consider the ethical implications of their everyday choices.⁶

Our collaboration developed as we explored how to bring walking into conversation with climate justice imperatives. The Paris Agreement and world-leading research in climate pedagogy underscore the urgency of renewing relationships between humans and their more-than-human environments. Walking responds to this urgency by slowing participants down, literally and figuratively, thereby creating space for them to cultivate the attentiveness required to perceive ecological change, shared forms of vulnerability, and the uneven impacts of climate disruption. Our work is informed by what Meyer and Land⁷ refer to as threshold concepts, moments of transformation that allow learners to cross into new ways of understanding their place in the world. We have found that the simple act of walking can open these thresholds, making complex climate questions newly accessible.

Within this framework, listening becomes a central pedagogical practice. Buller's artistic research explores listening as a multisensory, multimodal practice, where walking or drawing, sound or somatic attention might emerge as a creative and critical method for attuning to the multispecies ecologies of a place.⁸ Similarly, Wilson's work in climate communication and just energy transition foregrounds relationality, responsibility, and the need to support communities as they navigate political and cultural dimensions of climate action.⁹ Bomfim is a human geographer and post-doctoral fellow on this project, working at the intersection of climate justice, relational methodologies and municipal governance as part of a partnership between Just Powers¹⁰ at the University of Alberta, and the City of Edmonton. By integrating these disciplinary commitments, we frame walking as an opportunity for participants to listen across differences: listening to land, to themselves, to colleagues, and to what climate crisis demands of us.¹¹

In Edmonton, the work unfolds within a large municipal corporation of approximately 13,000 employees, where lunch-hour walks, workshops, and symposium sessions create new relational pathways across departments, job roles, and professional identities. These commitments, to place, relationality, and interdisciplinary collaboration, structure not only what we do, but how we do it. Walking offers a counterpoint to the time pressures, productivity metrics, and institutional silos that

shape contemporary learning environments. By stepping outside, literally and metaphorically, participants experience transformative learning that shifts their perspectives, allowing them to rediscover ethical and affective dimensions of their workplace responsibilities and to reinvigorate their climate commitments.

METHODS: A LAYERED LISTENING APPROACH

Our methodological approach builds directly from ambulatory pedagogy and relational commitments that shape the broader project.¹² We focus here on our work in Edmonton. Walking in this context is a mode of both inquiry and learning, and walking generates knowledge in multiple ways. Rather than relying on a single dataset or evaluative instrument, we adopt what we describe as a layered listening approach, a method that intentionally weaves together reflections from guided walks, open-ended survey responses, and audio recordings from a City-University symposium. Importantly, these data sources involve distinct participant groups and pedagogical contexts, and we bring them into dialogue analytically rather than treating them as a single participant dataset. These layers allow us to trace how participants learn through place-based experience, personal reflection, and community knowledge-sharing.

Walk data: Situated Reflections

The first layer of listening emerges through guided walks we offered to City of Edmonton employees across seasons, neighborhoods, and ecological zones. These walks were led by diverse knowledge keepers, including planners, artists, Indigenous scholars, ecologists, and sound practitioners, whose perspectives shaped participants' encounters with land, infrastructure, and more-than-human ecologies. Following selected walks, participants completed short open-ended surveys reflecting on what stood out to them, what they learned, how they felt, and what learnings they hoped to carry into their work.

Responses to this survey form the basis of our first dataset. To engage these reflections systematically, we conducted a qualitative sentiment-based analysis, tracing affective tones such as calm, inspiration, surprise, or concern. We complemented this with a cluster-based thematic analysis, grouping responses into shared categories¹³ including ecological noticing, place-based histories, climate action intentions (such as expressed desires to act, reflect differently, or carry insights into professional practice), and experiences of connection.

Symposium Audio: Educators' Voices

The second layer of listening comes from a symposium held in October 2024, which brought together City employees, graduate students, community partners, and university researchers. The symposium also included daily guided walks, symposium talks, workshops on somatic and creative practices (breathing and bodily attunement; bilateral drawing), discussions on ethics in a changing climate, and presentations on municipal climate initiatives. We focused our analysis on symposium sessions that explicitly engaged questions of attention, care, relational responsibility, ecological noticing, and professional ethics. Short excerpts or paraphrased insights from these recordings function in our analysis as conceptual anchors, points where educator teachings help contextualize or amplify experiential data from the walks. We approached these recordings as interpretive texts,¹⁴ listening for resonances with themes that later emerged from the survey data gathered after each walk in the durational walking series.

Integrating the Layers

The final component of our method brings these analytic layers into dialogue. Here, the sentiment and thematic analyses from walk reflections serve as a bridge, allowing us to map the emotional and conceptual contours of participants' experiences against ideas articulated in the symposium. Our layered listening approach highlights how learning emerges across modes, through walking, reflecting, and engaging with walk leaders (Knowledge Keepers and content experts). This multimodal integration allows us to trace not only what participants learned, but also how learnings resonate with broader teaching practices and ethical commitments articulated within the project.

EARLY FINDINGS FROM THE EDMONTON MIRROR LAB

Emotional and Sensory Attunement Through Walking

Across the guided walks analyzed in this study, participants consistently described walking as an experience that altered their emotional and sensory state. Rather than emphasizing information acquisition or problem-solving, reflections foregrounded feelings of calm, presence, curiosity, and attentiveness. Many participants noted that walking slowed them down, creating space for reflection that felt distinct from their everyday work routines.

Several reflections explicitly referenced a shift in pace and awareness. One participant described the walk as a “rare opportunity to slow down and be fully present”, while another noted that the experience created a “sense of calm that made it easier to notice what was happening around me”. These affective responses suggest that walking enables participants to enter a mode of attention that differs from typical institutional or workplace environments.

Sensory awareness was closely tied to these emotional shifts. Participants frequently mentioned noticing sounds, textures, temperature, and bodily sensations that they might otherwise overlook. One reflection described becoming aware of “how much I usually tune out the sounds of the city”, while another noted that paying attention to breath, footsteps, and ambient noise changed how the space felt emotionally. Participants framed these sensory observations as active, not passive, moments of learning that reshaped their relationship to place.

Importantly, emotional attunement was not limited to positive affect. Some participants expressed feelings of concern or unease, particularly when noticing environmental degradation and the disruptions caused to mobility and accessibility by winter conditions. While City employees understand these challenges intellectually, as one participant reflected, seeing them while on a walk “made the issues feel more real, not abstract”, suggesting that emotional engagement, whether calm, curiosity, or concern, play a role in deepening climate awareness.

Taken together, these reflections indicate that walking cultivates a form of emotional and sensory attunement that supports climate learning not through alarm, but through relational repair that reminds participants of their interconnections to multispecies kin that are thriving or dying, even in urban environments, based on our choices.¹⁵ Walking creates conditions in which participants are more open to noticing, reflecting, and engaging with climate-related questions in their everyday contexts.

Ecological and Place-Based Noticing in Everyday Urban Space

Alongside emotional and sensory shifts, reflections frequently reference elements such as native plants, water systems, soundscapes, and seasonal conditions, particularly accessibility in winter mobility. Several reflections emphasized surprise, as respondents mentioned they had previously been unaware of nature-based solutions and urban ecological havens that exist just off the beaten path of busy streets they regularly use to commute. One participant remarked that they “had passed this area many times without realizing the role it plays in managing water”, while another described a new awareness of native plant species and their relationship to resilience and biodiversity. These moments

of ecological noticing often reframed the city not as separate from nature, but as a layered environment where human and more-than-human systems intersect.

Sound walks, in particular, prompted reflections on listening as an ecological practice. Participants described becoming aware of overlapping soundscapes, traffic, wind, birds, water, and human voices, and how these sounds shaped their understanding of the place. One reflection noted that listening closely revealed “how many different systems are operating at once”, while another described sounds as a way of sensing environmental change and human impact.

Winter walks foregrounded issues of accessibility, infrastructure, and climate adaptation. Participants reflected on icy sidewalks, snow accumulation, and uneven access to public space, connecting these observations to broader questions of equity and responsibility. One participant noted that walking in winter “made me think differently about who can move easily through the city and who cannot”, highlighting how embodied experience exposes social dimensions of climate-related challenges.

Across these reflections, ecological noticing was closely linked to participants' professional roles within the City of Edmonton. Several participants explicitly connected walking observations to their work, noting that seeing ecological systems firsthand influenced how they thought about planning, design, maintenance, and decision-making. As one participant reflected, noticing these relationships “changed how I think about the impact of small decisions in my role” at the City.

Overall, the findings suggest that guided walking fosters a form of place-based learning in which ecological awareness emerges through direct engagement with everyday environments. While introducing new information, the walks also supported participants in noticing what was already present, often hidden in plain sight, and in recognizing their own relational positionality within urban ecological systems.

Pedagogical Resonances with the Symposium

The symposium recordings, overlaid with the survey data, offer an important pedagogical lens for interpreting patterns that emerged from the walks. Across multiple sessions, educators and knowledge keepers articulated concepts and practices that closely echoed the emotional, sensory, and ecological themes identified in walk reflections.

Several symposium presentations foregrounded care as an ethical and relational practice rather than an abstract principle.¹⁶ In sessions such as *Caring for the Planet is Caring for Ourselves* and *Professional Ethics*, speakers emphasized attentiveness, responsibility, and the emotional labour involved in responding to climate change within institutional contexts. These discussions resonate strongly with walk participants' reflections on calm, presence, and concern around our roles and responsibilities to act on climate change.

Similarly, the emphasis on listening that emerged across symposium sessions aligns closely with participants' experiences during sound walks and place-based explorations. Presentations such as *Listening to Climate Change through Urban Sound Walks*, and *Walking Around Water: How the Smartphone Changes the Way We See and Move Through Space* framed listening as an active, embodied practice, one that allows learners to perceive overlapping human and more-than-human systems. This pedagogical framing helps contextualize participants' reflections on soundscapes, sensory awareness, and noticing what is often overlooked in everyday urban environments.

The symposium also articulated the importance of slowness and attention in professional learning, particularly within fast-paced municipal settings. Speakers repeatedly highlighted the need to create spaces where reflection, dialogue, and embodied experience can interrupt habitual ways of thinking. This perspective mirrors participants' descriptions of walking as a rare opportunity to slow down, notice ecological relationships, and reconsider how everyday decisions intersect with climate responsibility.

This integrative process revealed several points of resonance: moments of calm aligning with discussions of care; surprise about overlooked wetlands connecting to talks on relational ethics; and participants' desires to take on greater climate responsibility both personally and within their workplace roles. We are not treating these as isolated findings, rather as confirmation of our hypothesis that curated walks, fostering attunement and community-building, provide transformational learning; however, this has not yet produced a full culture shift within the entire organization, for reasons of scale. By placing participant reflections in dialogue with symposium teachings, the layered listening approach reveals how walking, reflection, and pedagogy reinforce one another, supporting forms of climate learning that are relational, embodied, and situated within institutional practice.

CONCLUSION

This one year-project has already made a difference for the people who have participated. They are newly attuned to local ecosystems, thinking differently about climate questions, and imagining locally specific solutions. However, we have only had 136 people participate so far out of a workforce of 13,000. What is clear: this method works. What is also clear: there is a desire on the part of employees to continue walking and learning together. We are actively seeking funding to extend the life of this project. What if there was capacity to expand this project and allow all of the employees to have access to the opportunity to walk and co-create knowledge and climate responses together, across institutional divisions and silos? Imagine what could be possible then.

NOTES

¹ David A. Gruenewald, "The Best of Both Worlds: A Critical Pedagogy of Place," *Educational Researcher* 32, no. 4 (2003): 3–12.

² Jan H.F. Meyer & Ray Land. "Threshold Concepts and Troublesome Knowledge: Linkages to Ways of Thinking and Practising Within the Disciplines," in *Improving Student Learning: Theory and Practice – Ten Years On*, ed. (Chris Rust (Oxford: Oxford Centre for Staff and Learning Development, Oxford Brookes University, 2003), 412–424.

Dwayne Donald, "We Need a New Story: Walking and the wâhkôhtowin Imagination," *Journal of the Canadian Association for Curriculum Studies* 18, no. 2 (2021): 53–63, <https://doi.org/10.25071/1916-4467.40873>.

³ See, for example: Margaret Somerville, Leanne Tobin, and Jacinta Tobin, "Walking Contemporary Indigenous Songlines as Public Pedagogies of Country," *Journal of Public Pedagogies* 4 (2019): 13–27, <https://doi.org/10.15209/jpp.1171>.

⁴ Stephanie Springgay and Sarah E. Truman, *Walking Methodologies in a More-Than-Human World: WalkingLab* (London: Routledge, 2018).

⁵ Lee Beavington, "Walking Pedagogy for Science Education and More-Than-Human Connection," *Journal of the Canadian Association for Curriculum Studies* 18, no. 2: 163–178, <https://doi.org/10.25071/1916-4467.40626>.

⁶ Nick Shepherd, "Walking as Embodied Research: Coloniality, Climate Change, and the 'Arts of Noticing'," *Science, Technology and Society* 28, no. 1 (2023): 58–67, <https://doi.org/10.1177/09717218221102416>.

⁷ Jan H.F. Meyer & Ray Land. "Threshold Concepts and Troublesome Knowledge: Linkages to Ways of Thinking and Practising Within the Disciplines," in *Improving Student Learning: Theory and Practice – Ten Years On*, ed. (Chris Rust (Oxford: Oxford Centre for Staff and Learning Development, Oxford Brookes University, 2003), 412–424.

⁸ Rachel Epp Buller, "Walking and/as Listening," in *Disruption and Convergence: Generating New Conversations Through Arts Research*, ed. Rébecca Bourgault and Catherine Rosamond (Leiden | Boston: Brill, 2024), 117–26.

⁹ Sheena Wilson, "Hacking the Techno-Transition: The Possibilities of Deep Energy Literacy," *Socialni Studia / Social Studies* 19, no 1(2022): 29–53, <https://doi.org/10.5817/SOC2022-29550>.

¹⁰ See Just Powers, accessed January 9, 2026, www.justpowers.ca.

¹¹ Rachel Epp Buller and Sheena Wilson, "Climate Moves: Reaching for Threshold Knowledge One Walk at a Time," *Local Environment: International Journal of Justice and Sustainability* (2025): 1–19. <https://doi.org/10.1080/13549839.2025.2596719>.

Rachel Epp Buller and Sheena Wilson, eds., *Walking the Talk: Climate Moves and Relational Attunement* (Edmonton: University of Alberta Press, forthcoming).

¹² Dwayne Donald, Lesley Tait, and Etienna Moostoos-Lafferty, "Unlearning Colonialism by Attending to the Wisdom of Relational Renewal," *Canadian Journal of Education / Revue canadienne de l'éducation* 48, no.1, 1–28. <https://doi.org/10.53967/cje-rce.7071>.

¹³ Virginia Braun and Victoria Clarke, *Thematic Analysis: A Practical Guide* (London: SAGE Publications, 2021).

¹⁴ See, for example: Robert M. Emerson, Rachel I. Fretz, and Linda L. Shaw, *Writing Ethnographic Fieldnotes*, 2nd ed. (Chicago: University of Chicago Press, 2011).

¹⁵ For more on relational repair and interconnection, as it relates to action on climate, see Sheena Wilson, "Survival of the Most Collaborative: Climate Justice as a Logic for Flows of Air," in *Materiality of Air*, ed. Tatiana Konrad (Exeter: University of Exeter Press, 2025), 60–80.

¹⁶ "Attuning to Climate Symposium," Just Powers, accessed January 9, 2026, <https://www.justpowers.ca/projects/attuning-to-climate-symposium/>.

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COMMUNITY-BASED GENDER PEDAGOGY: A COLLABORATIVE WORKSHOP MODEL

Author:

JAMIE WAGMAN

Affiliation:

SAINT MARY'S COLLEGE; UNITED STATES

INTRODUCTION

As philosopher Judith Butler argued in 1990, there is gender trouble in America.¹ Just after the University of California Santa Cruz celebrated its 50th anniversary in 2025, the faculty deestablished the department, citing lack of resources. The University of Iowa also dismantled its Department of Gender, Women's and Sexuality Studies just after their 50th anniversary,² and Indiana's public higher education institutions plan to eliminate or consolidate hundreds of programs, among them, Women's and Gender Studies.³ Gender historian Joan Wallach Scott wrote that “the suppression of gender studies is not only an attempt to suppress a critical analytical tool, but also knowledge itself”.⁴ When departments dismantle, courses vanish, but so do relationships between faculty and students and community members, activists, and local leaders.

At a moment when Gender Studies programs are shrinking, community-engaged feminist pedagogy offers a strategy for sustaining the discipline through reciprocal partnerships with local organizations. Amy Driscoll described community engagement as “the collaboration between higher education institutions and their larger communities (local, regional/state, national, global) for the purpose of mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity.”⁵ Students are not sweeping in on marginalized communities to fix problems but instead building relationships with community members that lead to shared knowledge. Feminist pedagogy challenges hierarchical relationships and emphasizes shared authority and knowledge production.

Partnerships with LGBTQ+ centers, transgender nonprofits, and campus gender centers allow students to connect feminist theory with the daily work of community organizations. They can read theoretical texts and then come to understand how it is played out within a nonprofit's mission and day-to-day strivings. These centers are suffering, too – for money, resources and support during today's political climate. They need volunteers and programming and may welcome partnerships at this precarious time. The Gender & Women's Studies Department at Saint Mary's College in South Bend, Indiana partnered with the LGBTQ Center of South Bend for various learning opportunities for students: from internships to educational workshops, and panels. At a time when Gender Studies is under fire, community-based gender pedagogy is one way to show that this discipline is not dispensable.

Building partnerships occurs slowly, one coffee at a time. When I first moved to South Bend, I met with local community members to discuss possible collaborations. Early conversations reviewed nonprofits' missions, history, and my work and student outcomes. The LGBTQ Center of South Bend, Indiana and the Gender & Women's Studies department at Saint Mary's College collaborated from 2019 to 2023 to present an annual community “Deconstructing Gender” workshop. As the workshop

evolved, we created themes for our audience: Masculinities, Intersectionalities, Womanhood, and Gender and Politics. When we partnered with the local Center, students enrolled in the experiential learning course Feminist Theory presented these workshops for two audiences: first for an LGBTQ teen group and then again for the general public. Our collaborative partnership led to powerful experiences for presenters and audience members, including making space for difficult conversations and experiencing “aha” moments when community members made connections with students.

Work with community partners requires their input from start to finish. In her essay, “Ditchin’ the Master’s Gardening Tools for Our Own: Growing a Womanist Methodology from the Grassroots,” Vanessa L. Marr wrote that too much emphasis has been placed on student positive outcomes while ignoring the “voices, concerns, and contributions of community members” in service learning projects in higher education.⁶ For our project, we planned together throughout the entire process – deciding how long the workshop would be, how we would gain community feedback, and how we would revise content in the workshop. My students and I worked with LGBTQ Center Executive Director H.R. Jung for years and worked with additional staff members at the Center to hear their suggestions and benefit from their knowledge.

H.R. often remarked that one of his favorite aspects of the collaboration was working with college students, and he welcomed opportunities to mentor them through internships and volunteer experiences at the Center. From our first meeting, we developed a relationship built on mutual trust and shared educational goals. That trust allowed us to revise the workshop together each year and respond to community feedback. At the same time, our experience illustrated that partnerships are built through relationships with people as much as with institutions. When staff turnover at the Center ended our five-year collaboration, our Feminist Theory course had to pivot. We partnered instead with Saint Mary's College's newly established LGBTQ+ Center, whose growing programming created new opportunities for students even as our longtime community partner faced financial challenges.

STRATEGY

When H.R. and I first met in 2019, he said that he knew there would be an audience for a workshop, “because only seven years ago was the first time I’d been introduced to the concept of nonbinary. There’d have to be other people in the community with questions. For the student side, what a great opportunity to dive into this area of study with gender. It’s relevant to the students – they want to understand how gender does and doesn’t define them.”⁷ H.R. made himself available for an introductory class at the Center, a practice session, and for communication throughout the semester. We decided that a 75-minute program would allow students to interpret gender theories and apply them. Students formed small groups through self-selection after discussing themes they wish to highlight; this helped students take control of their learning. They worked in and outside of class to create original content. Students gained a substantive foundation in a broad range of feminist theoretical approaches such as queer and gender theory, Black Feminism, and Transgender History, understanding the wide range of theories available to a Gender Studies scholar. This assignment asks that they situate texts for a lay audience eager to engage with ideas about gender.

The workshop asks students to translate feminist theory into accessible public scholarship. They often use gender and feminist theories from Judith Butler, Kimberlé Crenshaw, and Susan Stryker and illustrate theory with examples from the media, history, current events, and personal experience. I have found that since starting the workshop assignment, students retain knowledge of feminist theory better and exhibit improved recall of feminist theory in subsequent classes. Students work together to decide what examples to privilege and how to create engaging content that asks participants to share. During our first year, students asked participants to create “body journeys.” One student modeled the activity by drawing their own experience with colored markers on a large sheet of butcher paper.

Participants illustrated moments when they first became aware of gender expectations. Some drew skirts or footballs; others included family members, schools, or religious communities that had shaped their understanding of gender. The activity provided an accessible way to discuss Judith Butler's theory of gender performativity because participants could visualize how repeated social expectations had influenced their identities. Students later reflected that facilitating the exercise required them to listen more than they spoke.

In a later workshop on Womanhood, students led participants through a game of “Two Truths and a Lie.” Rather than presenting information, students invited participants to distinguish between facts and myths about gender, transgender identities, and the intersections of gender with race and class. The game generated lively discussion as participants explained their reasoning to one another. These activities show that translating feminist theory for public audiences requires providing opportunities for participants to experience theoretical concepts through dialogue.

bell hook's *Teaching to Transgress* taught that faculty and students must regard one another as whole people; striving for knowledge together beyond books; questioning the authoritarian, hierarchical model of pedagogy; learning how to live in the world and value each other's experiences. She wrote of how engaged pedagogy emphasizes well-being and that the classroom does not belong more to a professor than to the students. She worked to create a space where everyone has freedom to “learn and grow without limits.”⁸ Feminist collaborations can offer students this kind of freedom and growth. hooks' claim that feminist pedagogy must allow students to integrate learning with a “passion of experience” fits within collaborative community partnerships that require teamwork and attention to detail. The Deconstructing Gender workshop has helped offer both theoretical reading content and an assignment that allows teams to learn together. In teaching students about race, sexuality, gender, and class, hooks noticed the discomfort it provoked: students were compelled to think about values and actions. Theory can be a healing place for both our students and community members, too.

The learning objectives for this assignment are for students to visit the Center, develop a collaborative workshop grounded in feminist theory, present it first in class, then to community audiences, revise based on feedback, and deliver a final public workshop. They are to define key concepts from feminist theorists in their own words, making connections between theory and lived experiences. How do these authors articulate gender? How has gender been historically understood and socially constructed? How does it function? How do lived experiences frame our conception of gender? How does gender interact with social class, race, and sexual orientation? Content must include definitions of gendered terminology, best practices, and workshop content that is active (versus passive) such as role playing or guided discussion in breakout groups. Their presentation must provide an introduction, content, and time for questions.

We spend one week in the semester reviewing our objectives and considering sources for building content. Students are graded based on clarity of arguments presented, strength of evidence, and engagement with their audience. The workshop assignment provides space for self-reflection and feedback. During a practice session for the class, a panel of GWS faculty members offer feedback to the students. Later, at the presentation for the teenagers, students receive immediate verbal feedback from teenagers and staff. Students make revisions before the final workshop presentation. Opportunities to receive feedback from professionals in the field, and from people younger than themselves, can be rare in academia. Additionally, students give one another feedback, illustrating Paulo Freire's assertion in *Pedagogy of the Oppressed* that, “Education must begin with the solution of the teacher-student contradiction, by reconciling the poles of the contradiction so that both are simultaneously teachers and students.”⁹ In 2023, the feedback we generated included a request for a handout of helpful sources. This assignment helps us move away from a hierarchical model of teaching.

Using bell hooks' ideas about power sharing and inclusive learning helped frame the assignment. hooks asks readers to rethink ways of knowing and to consider how we can share power and create inclusive learning environments. hooks wrote, "It has been my experience that one way to build community in the classroom is to recognize the value of each individual voice."¹⁰ In our class, students had space to share research and their writing. They discussed research challenges and triumphs with candor in the classroom.

While students are never forced to disclose personal information, students and participants tend to expose vulnerability at workshops. Students share stories about themselves, thus encouraging the audience to share. Our workshop on Mindful Masculinity led to male-identifying participants to share experiences growing up in an unhealthy masculine world. One student who identified as female commented on how that was a perspective she never considered. Scholar Patricia Hill Collins' theory of intellectual activism – confronting those who wield power within institutions while providing "everyday people" with truthful ideas to assist them – guides teaching and activism.¹¹

H.R. said that this collaboration is a favorite activity. "This collaboration is beneficial not only to the local LGBTQ+ community but also for the students. The community gets an opportunity to have some education but also conversation around gender and identity that goes beyond a 101 setting." He said he witnessed impact on the community each year, and remembers one community member being particularly touched that the Center created space to discuss and break down toxic masculinity scripts "because that conversation had never existed in his everyday life."

Saint Mary's student Mads Hornak remembers a moment during the 2022 workshop when a teenager shared feeling isolated from family due to their non-binary identity. Mads immediately reciprocated those feelings, and the two discussed challenges of growing up non-binary. Mads shared their phone number, and the two chatted afterward. "This was the first time I was able to share my journey of gender and how I had struggled through it," Mads said. "It felt amazing being able to provide support and advice that helped me while navigating the norms pushed on assigned female at birth persons by our society."¹² After the workshop, Mads began showing leadership in their major and said they better understood gender theory.

In addition, students benefit from partnering with a nonprofit they admire. Students have developed a strong relationship with the LGBTQ Center. They return for events, maintain a relationship with staff members, and direct other students to the center. Maggie Dunn, who presented in 2022, said the experience helped her finally understand the concept of intersectionality. "The best way to learn something is to teach it to other people," she said.¹³ An alum from 2020, Genesis Vasquez, said that the experience taught them "how to practice public speaking skills, especially on a topic that is stigmatized and difficult to talk about. It really relates to the work I am doing now," as a sexual assault advocate in Chicago.¹⁴

EVOLVING THE WORKSHOP MODEL

Our first workshop engaged a large public audience, and students designed interactive activities—including body maps, collaborative drawings, and pair-and-share exercises—that invited participants to move beyond abstract definitions and to connect theoretical concepts with their own experiences. Audience members thanked us for creating a space where conversations about gender could occur openly, reinforcing our belief that the workshop could serve both educational and community-building purposes.

As subsequent cohorts took on the assignment, however, new challenges emerged that required us to revisit our teaching practices. Challenges occur when student work is uneven or not of high quality, and H.R. Jung and I then provide even more extensive feedback. We saw students improve their presentation after hearing from both their professor and an expert in the field. One year, we wanted to

see more content on trans experiences when students discussed womanhood, and they spent the week before the workshop researching and revising. Another challenge has been requiring students to go to the LGBTQ Center outside of class, and we worked together to select dates and times that work for all.

We discovered that students often defaulted to lecture rather than interaction. Designing meaningful participatory activities proved more difficult than explaining theory. We responded by devoting more class time to modeling active learning strategies and encouraging students to think about themselves as facilitators rather than lecturers. The COVID-19 pandemic required another significant adaptation. In 2020, we moved the workshop online and focused on toxic masculinity during a period when debates over masking, vaccines, and political polarization shaped many participants' lived experiences. Facilitating through Zoom required different strategies for engagement, but the experience also underscored the importance of creating spaces where participants could reflect on gender and current events. Returning to in-person workshops the following year brought renewed energy, although rebuilding community participation after the pandemic presented challenges. While our audience members were engaged, expanding outreach would likely have brought together participants with an even wider range of perspectives.

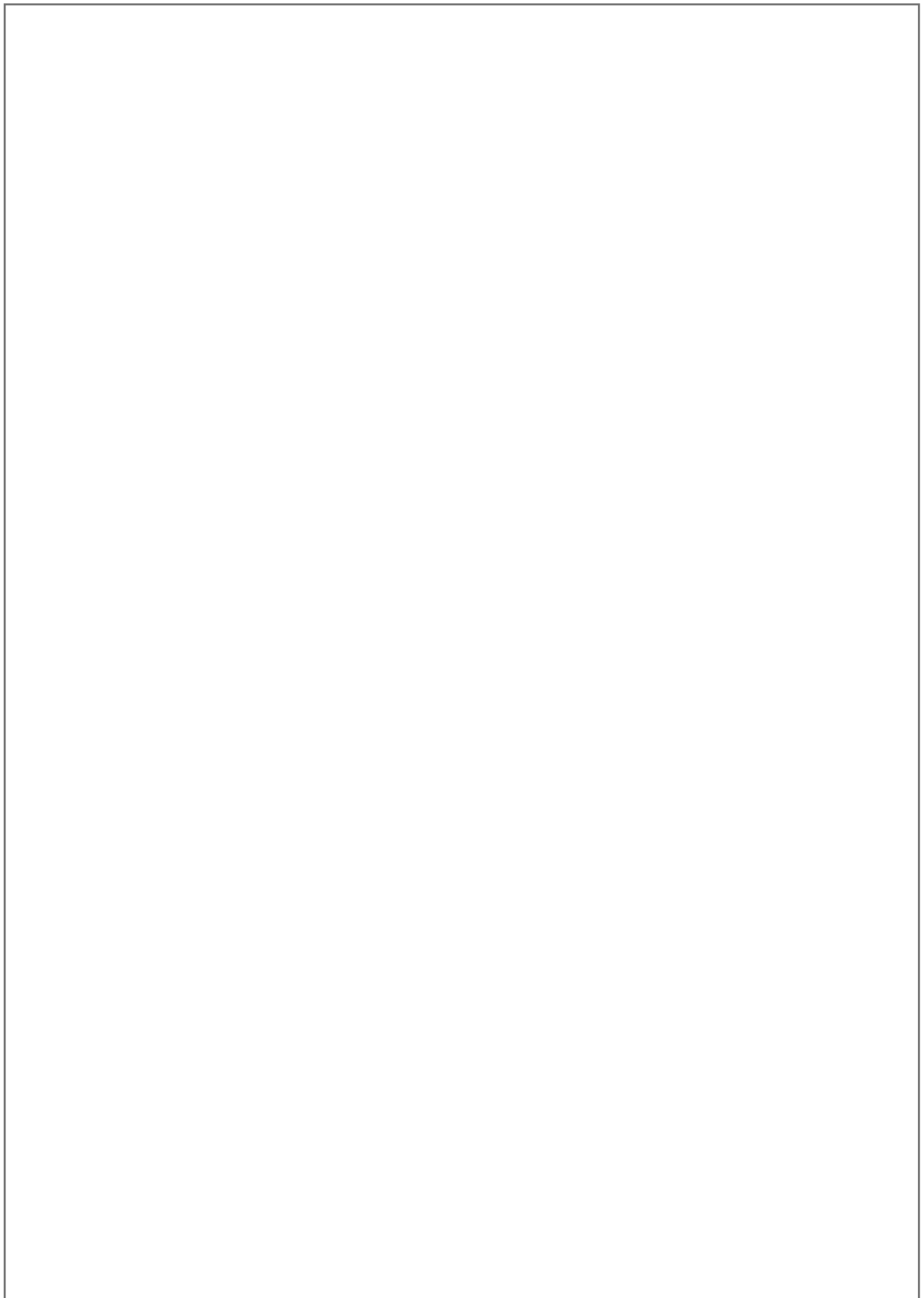
Community partnerships allow students to continue practicing critical inquiry beyond campus while strengthening local organizations facing similar pressures. In this political moment, collaborative public pedagogy is not merely an instructional strategy. It is a way to sustain the intellectual and civic work of Gender Studies and strengthen reciprocal partnerships beyond the college or university.

NOTES

- ¹ Judith Butler, *Gender Trouble: Feminism and the Subversion of Identity* (New York: Routledge, 1990).
- ² National Women's Studies Association, "On the State of the Field during a Second Trump Administration," January 2025. https://higherlogicdownload.s3.amazonaws.com/NWSA/7a8ba6a5-3bb1-4957-937f-39be8a6ac88f/UploadedImages/Statements/2025_/2025_NWSA_Statement_On_the_State_of_the_Field_during_a_Second_Trump_Administration.pdf. Accessed July 4, 2026.
- ³ Ryan Quinn, "Indiana Public Universities to 'Voluntarily' End 19% of Degrees," *Inside Higher Ed*, July 2, 2025. <https://www.insidehighered.com/news/faculty/curriculum/2025/07/02/ind-public-universities-voluntarily-ending-19-degrees>. Accessed July 4, 2026.
- ⁴ Joan Wallach Scott, "Gender studies courses are shutting down across the U.S." *The Guardian* February 13, 2026. <https://www.theguardian.com/commentisfree/2026/feb/13/gender-studies-trump-epstein>. Accessed July 4, 2026.
- ⁵ Amy Driscoll. "Carnegie's Community-Engagement Classification: Intentions and Insights." *Change* (Jan./Feb. 2008): 39.
- ⁶ Vanessa Marr, "Ditch the Master's Gardening Tools for Our Own: Growing a Womanist Methodology from the Grassroots," *Feminist Teacher*, 24 (2014): 100.
- ⁷ H.R. Jung, Zoom interview by the author. November 15, 2023.
- ⁸ bell hooks, *Teaching to Transgress: Education as the Practice of Freedom* (New York: Routledge, 1994), 207.
- ⁹ Paulo Freire, *Pedagogy of the Oppressed* (New York: Bloomsbury Academic, 2014), 26.
- ¹⁰ hooks, *Teaching to Transgress*, 40.
- ¹¹ Patricia Hill Collins, "Truth-Telling and Intellectual Activism," *Contexts* 12, no. 1 (2013): 36–41.
- ¹² Mads Hornak. Email message to the author. February 21, 2024.
- ¹³ Margaret Dunn. Email message to the author. April 8, 2024.
- ¹⁴ Genesis Vasquez. Email message to the author. September 16, 2022.

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AMPS PROCEEDINGS SERIES 47 v3

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19-21 November, 2025

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