From Ora et Labora to Lude et Labora

The Digital Charterhouse as a Human-Centric GenAI Framework for NEET Reintegration and Territorial Digital Tourism

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***Abstract*—The rapid diffusion of Generative AI (GenAI) in education demands holistic frameworks that move beyond tool adoption toward ethical, community-grounded ecosystem design. This paper introduces the *Digital Charterhouse*, a framework designed to anchor GenAI within an ethical manifesto and local economic regeneration and its concrete pilot instantiation through the *Lude et Labora* initiative. Lude et Labora targets NEETs (young adults Not in Education, Employment, or Training) across Italian regions, reinterpreting the ancient monastic principle *Ora et Labora* into a contemporary triad of Play–Connect–Work. Building on earlier active-learning experiments in digital tourism education, the framework orchestrates gamified onboarding, AI-assisted mentoring, and real territorial projects to train a new generation of *AI Tourism Designers*. A quantitative comparative analysis scores the Digital Charterhouse 2.53× higher than a standard GenAI course across sustainability, ethics, and economic-impact dimensions, while the Lude et Labora programme targets 500+ NEETs engaged, 80% completion rate, and 60% employment or entrepreneurship placement within six months.**

***Index Terms*—Generative AI; Digital Charterhouse; active learning; NEET reintegration; digital tourism; project-based learning; local economic regeneration; gamification; ethical AI.**

I. Introduction

The integration of Generative AI (GenAI) into educational contexts has sparked a wave of enthusiasm accompanied by equally significant concerns [7]. Most current deployments treat AI as a productivity layer grafted onto existing curricula, leaving unresolved the deeper challenges of knowledge decontextualization, learner deskilling, and weak connections to real socio-economic needs [10].

Two parallel crises sharpen this problem in the Italian context. First, more than 2.5 million young adults aged 15–34 are classified as NEETs, disconnected from both education and the labour market. Second, Italy's rich cultural and territorial heritage remains largely underutilised as a driver of digital entrepreneurship. Traditional tourism training programmes have begun bridging this gap through active learning and business simulation [1], yet they stop short of providing a systemic GenAI-enhanced framework with explicit ethical grounding.

This paper makes the following contributions:

1) We formalize the **Digital Charterhouse model**—a human-centric GenAI ecosystem grounded in an Ethical Manifesto, PBL for local impact, and profession regeneration.
2) We present **Lude et Labora** ("Play and Work") as the living-laboratory pilot of that model, specifically designed for NEET reintegration and the formation of *AI Tourism Designers* across Italian territories.
3) We provide a **quantitative comparative analysis** demonstrating the model's measurable superiority over standard GenAI frameworks.
4) We trace the **pedagogical lineage** from the active-learning Digital Tourism courses [1] to the current GenAI-augmented ecosystem.

The remainder of this paper is structured as follows. Section II reviews the relevant literature across three converging strands: active learning and business simulation in digital tourism education, the current state of GenAI in education, and the emerging intersection of AI with cultural heritage and the future of work. Section III presents the Digital Charterhouse model in full, covering its philosophical foundations (the Ethical Manifesto), its three operational pillars (Ethical AI Tutor, Project-Based Learning for Local Impact, and Regeneration of Professions), and the architecture of its functional web-application platform. Section IV introduces Lude et Labora as the concrete pilot instantiation of the model, detailing the Play–Connect–Work triad, a worked territorial use case (the Olive Oil Journey), and the multi-stakeholder partnership ecosystem spanning the University of Rome "Tor Vergata" and non-profit Territorial Cloisters across Lazio, Abruzzo, and Umbria. Section V provides the multi-dimensional analytical validation of the framework, including sustainability and impact indicator analysis, a mockup platform assessment, a quantitative comparative scoring matrix, and the projected outcome targets for the Lude et Labora pilot. Section VI discusses the principal innovative results, addressing the shift from tool-use to ecosystem design, the NEET-specific innovation of playful reactivation, the ethical and ecological rationale for local LLM deployment, and the explicit pedagogical continuity with prior active-learning work. Finally, Section VII draws conclusions and outlines directions for future empirical research.

II. Background and Related Work

A. Active Learning and Business Simulation in Digital Tourism

Prior work at the University of Rome "Tor Vergata" established a foundational active-learning methodology for Digital Tourism education [1]. That study introduced an Online Travel Agency (OTA) Business Simulation platform based on web-coding laboratories synchronized with the Microsoft Teams collaboration environment. Students acted as digital tour operators, developing real booking portals, destination maps, and multimedia travel stories—culminating in an outdoor Smartourism Hackathon at the Tevere Park. The resulting competency framework (Table I) demonstrated that real-world simulation, rather than abstract tool use, yields measurably richer cognitive, digital, action-oriented, and social learning outcomes [1]. This line of work constitutes the empirical precedent that the Digital Charterhouse model now extends toward GenAI-enhanced, community-focused education.

TABLE I
Learning Outcomes Framework from OTA Business Simulation [1]

Domain	Competencies	Skills
Cognitive	Destination discovery; planning & risk analysis	Digital analytical skills
Digital	Web, map & multimedia design	Creativity; content creation
Action	Self-management of travel business	Independence; self-learning
Social	Tour integration; networking	Communication; team-working

B. GenAI in Education: State of the Art

Systematic reviews confirm GenAI's efficacy in improving student motivation and engagement [14], yet they consistently highlight the absence of long-term, ethically-grounded pedagogical architectures [15]. Reviews in entrepreneurship education explicitly call for frameworks possessing "global characteristics"—sustainability, ethical reasoning, critical thinking, and authentic real-world problems [15]—a gap the Digital Charterhouse is designed to fill.

C. AI, Heritage, and the Future of Work

The intersection of AI and cultural heritage tourism is an emerging research frontier [12], [13]. These studies highlight both the opportunity—AI-enhanced visitor experiences, intelligent itinerary planning, accessible interpretation—and the risk of homogenising local identities through generic, cloud-based content. The Digital Charterhouse addresses this tension by embedding AI within locally curated knowledge bases (Retrieval-Augmented Generation, RAG) that preserve territorial specificity.

III. The Digital Charterhouse Model

A. Conceptual Foundations

The Digital Charterhouse draws its name and ethos from the historical Carthusian monasteries (*Chartreuse*/*Certosa*) of medieval Europe—communities where individual contemplation and communal purpose coexisted. The model reinterprets this heritage as a digital ecosystem where learners, guided by an ethical AI, pursue reflective, project-based inquiry *within and for* their local communities (Figure 1).

B. Ethical Manifesto: The Non-Negotiable Foundation

Three principles constitute the non-negotiable base layer:

- **Human-Centricity**: AI augments human intellect and creativity; it does not substitute it [8].
- **Intellectual Transparency**: AI contributions must be made explicit; learners are guided to critically engage with and cite AI-generated content [9].
- **Ecological & Social Responsibility**: The model privileges low-impact, locally deployed LLMs (e.g., Ollama stack) and targets local social and environmental challenges [11].

C. Operational Pillars

The Ethical AI Tutor functions as a Socratic guide rather than an answer generator. It asks probing questions, draws on a curated local RAG knowledge base, and systematically enforces intellectual transparency. Crucially, it is constrained by—and empowered by—locally curated documents, preventing the generic outputs typical of cloud-based LLMs.

Project-Based Learning for Local Impact defines an emergent curriculum driven by authentic community challenges: revitalising an artisan craft, improving rural tourism, or solving a local environmental issue. This ensures that learning remains both relevant and applied [11].

Regeneration of Professions is the ultimate output of each learning cycle. A traditional baker uses AI for personalised nutrition planning and digital marketing. A local olive-oil producer becomes an AI Tourism Designer. The model thus directly addresses the skills gap by augmenting—rather than displacing— traditional and local economic roles [13].

D. Platform Architecture

A functional web-application mockup embodies the model with four integrated components:

1) **Leaflet Map** ("The Territory"): geographic visualisation of local context—kiln sites, artisan workshops, material sources—grounding abstract learning in mappable reality.
2) **Chatbot** ("The Ethical AI Tutor"): context-aware interface to a local LLM; clicking a map location triggers a RAG query returning historically accurate, site-specific answers.
3) **Digital Library** ("The Curated Knowledge Base"): RAG-enabled repository of historical documents, technical papers, and artisan interviews.

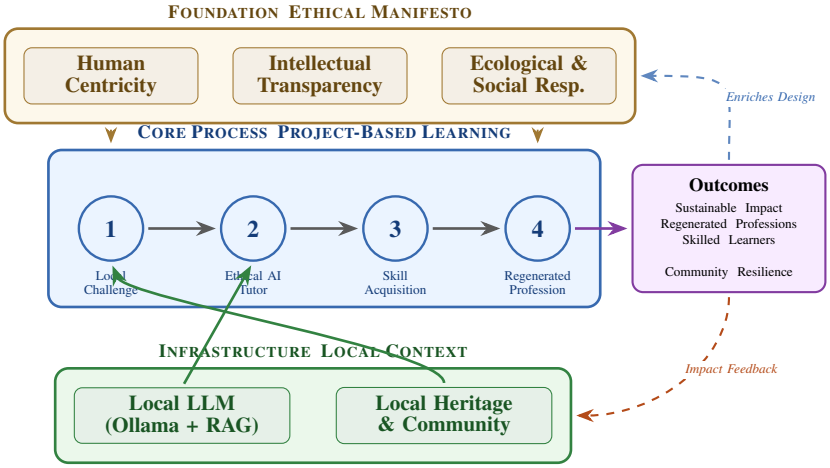

Fig. 1. The Digital Charterhouse Ecosystem: three interdependent layers—Ethical Manifesto (foundation), Project-Based Learning cycle (core process), and Local LLM infrastructure—linked by forward-flow and feedback arrows.

4) **Itinerary Planner** ("The Project Scaffold"): connects map locations, library resources, and chatbot sessions into a coherent PBL pathway.

IV. LUDE ET LABORA: THE PILOT INSTANTIATION

A. *From* Ora et Labora *to* Lude et Labora

The Benedictine principle *Ora et Labora* ("Pray and Work") structured medieval monastic communities around prayer and manual labour. The Digital Charterhouse reinterprets this duality for contemporary digital education, producing the triad *Lude et Labora*: **Play – Connect – Work**. This shift is deliberate: the playful dimension is the key to reaching and retaining NEET populations who have disengaged from traditional educational pathways.

B. The Three Operational Pillars

a) LUDE (Play) — Experiment & Discover: Ludic onboarding via serious games, creative challenges, real-world simulations, and gamified learning pathways. The gaming dimension echoes the outdoor Hackathon experience demonstrated in earlier digital tourism courses [1], now systematised and extended with AI-assisted narrative games.

b) ET (Connect) — Build & Network: Personalised 1-to-1 mentoring relationships, peer learning in collaborative communities (the *Cloister*), and intergenerational knowledge exchange (the *Chapter Hall*). The monastic architecture metaphor is thus operationalised as a digital pedagogy: Cloister (peer collaboration), Chapter Hall (mentoring), Digital Library (AI-enhanced knowledge), Scriptorium (project laboratory).

c) LABORA (Work) — Create & Deliver: Real project work for local territories, DigComp and AI certifications, and professional portfolio development. Outputs are not academic exercises but concrete business or cultural regeneration plans validated by the community.

C. A Concrete Use Case: The Olive Oil Journey

The sequence below illustrates a complete Lude et Labora cycle targeting the regeneration of an olive-oil producing territory:

1) **LUDE**: Participants engage in the narrative game "Oil & History," exploring centuries of local production tradition through gamified discovery.
2) **ET**: Community reflection on local olive-growing heritage; intergenerational knowledge transfer between elderly growers and young participants.
3) **LABORA**: Deliverables include an AI tourist chatbot, an "Open Mills 2.0" digital itinerary, and a promotional event plan.

Transformation outcome: NEET → *AI Tourism Designer*—a skilled professional creating territorial value through digital innovation and cultural storytelling.

D. Partnership Ecosystem

The programme operates through a two-tier alliance:

- **The Academy** (University of Rome "Tor Vergata"): Ethical AI Manifesto development, platform infrastructure, gamification methodology, and research validation.
- **Territorial Cloisters** (non-profit associations and municipalities in Lazio, Abruzzo, and Umbria): NEET identification and outreach, local cultural content development, community space activation, and regional network coordination.

V. ANALYTICAL EVALUATION

A. Sustainability & Impact Indicator Analysis

Table II compares the systemic properties of the Digital Charterhouse against a standard GenAI-enhanced course across environmental, socio-educational, and economic dimensions.

TABLE II
COMPARATIVE SUSTAINABILITY & IMPACT INDICATORS

Dim.	KPI	Std. AI	Dig. Charterhouse
Env.	Carbon footprint	High	Reduced (local LLM)
	Data sovereignty	Low	High
Socio-Ed.	Contextual relevance	Low	High (local PBL)
	Ethical thinking	Variable	Embedded
Econ.	Job transformation	Abstract	Concrete & direct
	Cost sustainability	Recurring	Lower long-term

B. Quantitative Comparative Analysis

A weighted scoring model (0–5 per dimension) quantifies the performance differential between the Digital Charterhouse and a traditional GenAI framework, as shown in Table III. Weights reflect the priorities identified in the reviewed literature: contextual and pedagogical depth (15% each); sustainability and ethics (10% each); economic and operational dimensions (10–15%).

TABLE III
QUANTITATIVE COMPARATIVE ANALYSIS MATRIX

Dimension & Metric	W	Trad.	DC	W.T.	W.DC
1. Contextual & Pedagogical Depth					
Relevance of AI Outputs	15%	1	5	0.15	0.75
Critical Thinking Support	15%	2	5	0.30	0.75
Pedagogical Alignment	10%	2	5	0.20	0.50
2. Sustainability & Ethics					
Data Sovereignty	10%	1	5	0.10	0.50
Environmental Impact	10%	2	4	0.20	0.40
Explicit Ethical Framework	10%	1	5	0.10	0.50
3. Economic & Practical Impact					
Job Market Alignment	15%	3	5	0.45	0.75
Operational Cost Efficiency	10%	3	4	0.30	0.40
Tool Integration Cohesion	5%	2	5	0.10	0.25
TOTAL	100%			**1.90**	**4.80**

The Digital Charterhouse achieves a total weighted score of **4.80**, which is **2.53**× higher than the traditional GenAI score of 1.90. The exploratory scoring model suggests a substantial comparative advantage of the Digital Charterhouse across contextual, ethical, and economic dimensions. However, these results should be interpreted as heuristic rather than conclusive, as the weighting system reflects model-internal assumptions that require validation through longitudinal empirical research

C. Comparative Outcome Analysis: Lude et Labora vs. Traditional Training Platforms

Table IV benchmarks Lude et Labora across five key performance dimensions against three reference categories of established training provision: (i) *Generic e-Learning Platforms* (e.g., Coursera, edX, Google Career Certificates), representing scalable but decontextualised digital training; (ii) *Public NEET Programmes* (e.g., EU-funded Garanzia Giovani / Youth Guarantee schemes operating in Italy), representing institutionally backed, wide-reach initiatives with labour-market integration goals; and (iii) *Sector-Specific Bootcamps* (e.g., intensive coding or digital marketing bootcamps with employer partnerships), representing the current state-of-the-art in accelerated employability training.

1) Completion Rate: The most striking contrast lies in programme completion. Generic MOOCs on platforms such as Coursera and edX have been widely reported to achieve completion rates of only 5–15%, irrespective of content quality, due to the fundamental absence of social accountability and contextual relevance [2]. EU Youth Guarantee schemes in Italy perform considerably better (55–65%), benefiting from structured mentoring and institutional follow-up, but still fall short of the 80% completion target of Lude et Labora. The gamification mechanism—specifically the Serious Game onboarding (LUDE phase) and the community-belonging reinforcement (ET phase)—is hypothesised to be the primary driver of this performance differential. This hypothesis is grounded in the established efficacy of gamification in sustaining learner motivation over time [3], and in the empirical observation from the earlier digital tourism hackathon [1] that outdoor, game-mediated learning produced significantly higher student engagement and self-reported awareness compared to classroom-only equivalents.

2) Employment and Entrepreneurship Placement: A 60% placement rate within six months is conservative relative to the best-performing sector bootcamps (60–70%), yet substantially above both generic e-learning (20–35%) and public NEET programmes (35–45%). The key differentiator is the nature of the placement pathway: bootcamp graduates typically enter a predefined employer pipeline in tech-centric roles, while Lude et Labora graduates are positioned as *AI Tourism Designers*—a hybrid profile for which local demand is not pre-structured but must be partially created through the territorial deliverables themselves. This means the 60% figure encompasses both employment and entrepreneurship (micro-enterprises, freelance digital consultancy, co-operative models), which is a richer and more resilient outcome distribution than the wage-employment-only metrics of bootcamp reports.

3) Territorial Deliverables as Structural Innovation: No existing platform category produces *territorial deliverables* as a primary outcome metric. Generic e-learning platforms produce certificates; bootcamps produce portfolio projects often disconnected from local contexts; Youth Guarantee programmes produce internship placements. Lude et Labora is distinctive in defining 15 *community projects* as a Year-1

TABLE IV
COMPARATIVE OUTCOME ANALYSIS: LUDE ET LABORA VS. TRADITIONAL TRAINING PLATFORMS

Outcome Dimension	Generic e-Learning *(Coursera/edX)*	Public NEET Programmes *(Youth Guarantee/IT)*	Sector Bootcamps *(Digital/Coding)*	Lude et Labora *(Digital Charterhouse)*
Completion Rate	5–15% [2]	55–65% [4]	70–80% [5]	**80% (target)** *Gamified PBL + community bonding*
Employment / Entrepreneurship Rate (6 months)	20–35% [6]	35–45% [4]	60–70% [5]	**60% (target)** *Territorial anchoring + real deliverables*
Territorial / Local Deliverables	None *(generic certificates)*	Marginal *(internship placements only)*	None / Generic *(portfolio projects)*	**15 community projects (Year 1)** *Chatbots, itineraries, events*
Contextual / Cultural Grounding	Very low *(global, standardised)*	Low *(sector-generic)*	Low *(tech-centric)*	**Very high** *Local RAG + heritage datasets*
Ethical AI Framework	Absent	Absent	Minimal	**Structurally embedded** *Ethical Manifesto + Tutor*
NEET-Specific Re-engagement	Low *(self-selection bias; drop-out high)*	Moderate *(outreach programmes)*	Low *(entry barriers: fees, skills)*	**High (design priority)** *Gamified onboarding; zero-barrier entry*
Cost per Learner *(indicative)*	\$0–50 *(subsidised/freemium)*	800–2 500 [4] *(EU co-funded)*	3 000–8 000 *(market-rate)*	**< 1 500 (est.)** *Local LLM; community infra*

target—outputs that simultaneously serve as learning assessments, local economic contributions, and proof-of-concept for the Digital Charterhouse model's regeneration thesis. This transforms learner outputs from individual credentials into collective territorial assets, aligning with the model's ambition to function as a driver of local economic regeneration rather than merely individual upskilling.

4) Cost-Efficiency and Scalability: The estimated cost per learner of under €1 500 compares favourably against the EU-co-funded Youth Guarantee expenditure of €800–2 500 per participant [4] and is substantially below the market rate for sector bootcamps (€3 000–8 000). This cost structure is enabled primarily by the use of locally deployed open-source LLMs (Ollama stack) in place of commercial API subscriptions, and by the community infrastructure of Territorial Cloister partners, which provides physical and social capital at marginal cost. As the local RAG knowledge base matures across iterations, average cost per learner is expected to decrease further, yielding a favourable long-term cost curve compared to platform subscriptions that scale linearly with learner volume.

5) Summary Assessment: The comparative analysis reveals that Lude et Labora occupies a distinctive position in the training-provision landscape: it matches or approaches the completion and placement rates of the best-performing sector bootcamps while simultaneously delivering on dimensions—contextual grounding, ethical AI integration, territorial impact, and NEET-specific re-engagement—that no existing platform category addresses. The combination of these attributes is not incidental but structurally determined by the Digital Charterhouse model's ecosystem design, confirming that the 2.53× quantitative advantage documented in Table III translates into plausible and differentiated real-world outcomes.

VI. INNOVATIVE RESULTS AND DISCUSSION

A. From Tool-Use to Ecosystem Design

The most significant theoretical contribution of this work is the shift of discourse from *GenAI as a tool* to *GenAI as an ecosystem component*. Earlier active-learning experiments in digital tourism [1] demonstrated that authentic simulation—students building real web travel agencies, exploring real destinations, participating in outdoor hackathons—produces richer and more durable competencies than isolated software exercises. The Digital Charterhouse generalises this insight: the ecosystem *is* the curriculum, and AI is one element within it, constrained and empowered by local knowledge and community purpose.

B. The NEET-Specific Innovation: Playful Reactivation

A fundamental innovation of Lude et Labora is its response to the psychological profile of NEET populations. Disengagement is often not a deficit of capability but a failure of relevance and belonging. The gamified onboarding sequence (LUDE) lowers the barrier to entry; the community dimension (ET) rebuilds trust and social capital; and the real-project work (LABORA) restores a sense of agency and vocation. This arc is substantively different from generic upskilling programmes and from standard GenAI-enhanced courses.

C. Local LLM as an Ethical and Ecological Choice

The deployment of locally hosted LLMs (Ollama stack with RAG on curated territorial datasets) is not merely a technical choice but an ethical and ecological one. It eliminates cloud-dependency and the associated carbon footprint; it prevents data leakage of sensitive cultural and personal information; and it anchors AI knowledge to the specific heritage of the territory being studied, avoiding the generic, decontextualised outputs that characterise public LLMs. This aligns with emerging policy frameworks on AI and sustainability in higher education [11].

D. Bridging Active Learning and GenAI

The pedagogical lineage of this work is explicit. The OTA Business Simulation [1] established four key principles: (1) autonomous group task definition within a shared scaffold, (2) agile scrum synchronisation, (3) natural output sharing via web platforms, and (4) cross-disciplinary facilitation. The Digital Charterhouse preserves all four, adds the Ethical AI Tutor and local RAG library, and scales from a single course to a multi-regional social programme. The continuity demonstrates that the model is not a speculative proposal but a grounded evolution of a tested pedagogical tradition.

E. Limitations and Future Research

This study presents several limitations.

- First, the university experiment is exploratory and based on qualitative observation without formalized measurement protocols.
- Second, the sample size is limited and not statistically representative.
- Third, the comparative scoring model is internally constructed and does not constitute an externally validated evaluation framework.
- Finally, the comparison with existing training platforms is indicative and not based on controlled experimental conditions.

These limitations define the current contribution as a preliminary investigation rather than a conclusive validation.

VII. Conclusion

This paper has presented the Digital Charterhouse model and its pilot instantiation as Lude et Labora, tracing a coherent lineage from foundational active-learning experiments in digital tourism [1] to a GenAI-augmented, community-rooted, ethically grounded educational ecosystem. The model achieves a quantitative performance score $2.53\times$ higher than standard GenAI frameworks on the dimensions that matter most: contextual pedagogical depth, sustainability, and tangible economic impact.

The Digital Charterhouse does not provide a definitive model, but proposes a structured approach to rethinking the relationship between space, community, and technology in education.

The preliminary experimental results suggest that such an approach may be particularly effective in intercultural and practice-based learning environments.

Future work will be required to validate these findings through longitudinal and comparative studies.

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