The Digital Ecosystem Supporting Learning: The University of Padova's Experience in the Age of Artificial Intelligence

Dario Da Re*

Riassunto

L'Università di Padova ha sviluppato un ecosistema digitale integrato a supporto dell'insegnamento e dell'apprendimento, fondato su una combinazione coerente di piattaforme, servizi e strumenti di intelligenza artificiale. Basato su Moodle e potenziato grazie al progetto PNRR Digital Education Hub ALM@, l'ecosistema integra infrastrutture tecnologiche avanzate, risorse multimediali, formazione del personale docente e soluzioni per l'accessibilità all'interno di una strategia istituzionale unitaria. L'ampia diffusione e l'intenso utilizzo delle piattaforme dimostrano la capacità del sistema di sostenere l'innovazione didattica su larga scala. L'integrazione di servizi basati sull'IA amplia ulteriormente le potenzialità dell'ecosistema, favorendo apprendimento personalizzato, partecipazione attiva e miglioramento continuo, offrendo un modello scalabile per la trasformazione digitale dell'istruzione superiore.
Parole chiave: Ecosistema digitale; Istruzione superiore; Intelligenza artificiale; Moodle; Innovazione didattica

Abstract

The University of Padova has developed an integrated digital ecosystem that supports teaching and learning through a coherent combination of platforms, services, and artificial intelligence tools. Built around Moodle and strengthened by the PNRR Digital Education Hub ALM@ project, the ecosystem combines advanced technological infrastructures, multimedia resources, faculty

* Director Digital Learning and Multimedia Office, University of Padova.

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development, and accessibility solutions within a unified institutional strategy. Large-scale adoption and extensive usage demonstrate its capacity to support educational innovation across a broad academic community. The integration of AI-powered services further extends this ecosystem, fostering personalised learning, active engagement, and continuous improvement providing a scalable model for digital transformation in higher education.
Keywords: Digital ecosystem; Higher education; Artificial intelligence; Moodle; Educational innovation

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The University of Padova has built, over time, a digital ecosystem for teaching that, in terms of breadth, architectural coherence, and usage volumes, has no comparable counterpart in the Italian academic landscape. This achievement is not solely the result of sound technological choices: it is the product of a systemic strategy that found in the PNRR Digital Education Hub ALM@ project – a network of 14 Italian universities – a decisive accelerator for spreading and embedding a culture of digital innovation within the institution. The specialised human resources, multimedia production infrastructures, and training pathways made possible by ALM@ have transformed isolated best practices into shared models, lowering barriers to adoption and promoting cultural change even before technological change.

With a community of approximately 100,000 people – students, faculty, and administrative and technical staff – the University is not managing an experiment, but a fully operational infrastructure, tested daily by tens of thousands of simultaneous users and underpinned by a decade-long partnership with Amazon Web Services. At the heart of this architecture lies Moodle, the learning management platform around which all other adopted technological solutions organically and seamlessly converge. Moodle is not simply a content repository: it is the connective hub of the entire digital teaching experience. The numbers confirm this: over the past year, the platform recorded more than 2.6 billion total requests, generating 225 Terabytes of traffic. The STEM area leads in the number of courses created (3,231), followed by the Humanities area (2,186), while the medical area stands out for the intensity of its use of assessment tools, with 923 quizzes created. Over the past year, Moodle has also delivered more than 11.5 million emails, with daily peaks exceeding 100,000 notifications, making it a critical infrastructure not only for teaching, but for the entire academic life of the institution.

Around this core, Zoom and Kaltura/Mediaspace.it are integrated, both enhanced in terms of user competencies and content produced thanks to ALM@

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resources. Zoom recorded approximately 600,000 meetings for over 25 million minutes annually. Kaltura/Mediaspace holds more than 400,000 videos, 5.1 million views in 2025, and nearly 30 million minutes consumed by 58,642 unique users in 192 countries – a global reach made possible in part by the new multimedia production infrastructures funded by the PNRR, which translate into a measurable impact on the quality of the educational offering.

On the engagement front, Wooclap recorded 16,861 events with 2,266,869 responses from approximately 204,000 unique participants: active learning practised at mass scale, normalised also through the training activities carried out within the ALM@ network. On the accessibility side, ReadSpeaker and the Brickfield Accessibility Toolkit ensure materials are available in alternative formats for students with learning disabilities, special educational needs, and other disabilities, in line with the European Accessibility Act – with dedicated training pathways developed and disseminated specifically within the ALM@ framework.

The most advanced expression of this ecosystem is Lucrez-IA, a virtual assistant based on Anthropic models (currently Claude Sonnet 4.6) and natively integrable into Moodle. With over 6,000 users, 20,000 conversations, and nearly 200,000 million tokens processed daily, this is not an experiment but a production service. The January 2026 release also introduces specific Moodle plugins, including: a per-course AI tutor, an automatic question generator, a professional simulator, an automatic course builder, a lesson recorder with live transcription, and AI feedback for assignments. Here too, the expertise aggregated within the ALM@ network has helped define use cases and quality criteria that guide the system's evolution.

This trajectory is part of a broader vision represented by the Lifelong Learning platform – with UniPd being the first in Italy to issue micro-credentials – and by the PNRR ALM@ project, which has operated on three synergistic levels: new human resources dedicated to teaching innovation, advanced multimedia infrastructures, and a culture of innovation disseminated through communities of practice and continuous training. The result is an integrated, inclusive, and continuously evolving architecture, capable of meeting the challenges of contemporary education with the robustness of an institution that measures its outcomes in billions of interactions.

Sitografia

ALMA (s.d.). *ALMA – Advanced Learning Multimedia Alliance*. -- Tratto da https://www.almarete.it/.

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No Derivatives License. For terms and conditions of usage please see: http://creativecommons.org

Amazon Web Services (s.d.). *AWS per l'istruzione*. -- Tratto da https://aws.amazon.com/it/education/.
Amazon Web Services (s.d.). *Amazon Bedrock*. -- Tratto da https://aws.amazon.com/it/bedrock/.
Moodle (s.d.). *Moodle*. Tratto da https://moodle.org/.
Università degli Studi di Padova (s.d.). *Digital Learning and Multimedia – DLM*. -- Tratto da https://elearning.unipd.it/dlm/.
Zoom (s.d.). *Zoom per l'istruzione*. -- Tratto da https://www.zoom.com/en/products/collaboration-tools/solutions/education/.
Kaltura (s.d.). *Kaltura for higher education*. -- Tratto da https://corp.kaltura.com/experiences/higher-education/.
Università degli Studi di Padova (s.d.). *MediaSpace*. -- Tratto da https://mediaspace.unipd.it/.
Anthropic. (s.d.). *Claude*. -- Tratto da https://claude.com/.
Università degli Studi di Padova (s.d.). *Lucrezia*. -- Tratto da https://lucrezia.unipd.it/.

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