Responsible AI for Digital Cooperation in the Mediterranean Higher Education

OCCASIONAL PAPER

How is AI shaping teaching and learning in Mediterranean Higher Education?

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Publisher

Mediterranean Universities Union (UNIMED)
unimed@uni-med.net | www.uni-med.net
Published as a digital publication on the Internet, July 2025

Suggested Citation

Atenas, J., & Stefanelli, C. (2025). *Responsible Artificial Intelligence for Digital Cooperation in the Mediterranean Higher Education*. Mediterranean Universities Union (UNIMED). https://doi.org/10.5281/zenodo.15731005

Cite case studies as

Authors (2025). *Title of the case study*. In J. Atenas & C. Stefanelli (Eds.), *Responsible Artificial Intelligence for Digital Cooperation in the Mediterranean Higher Education*. Mediterranean Universities Union (UNIMED). https://doi.org/10.5281/zenodo.15731005

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Executive summary

The Responsible Artificial Intelligence for Digital Cooperation in the Mediterranean Higher Education paper offers a comprehensive, multi-level analysis of how Artificial Intelligence (AI) is reshaping higher education (HE) across the Mediterranean region. It bridges the gap between the recommendations of international organisations, such as UNESCO and the United Nations, national AI strategies, and emerging institutional practices. It calls for coordinated, ethical, open, and inclusive AI integration in HE systems to ensure that digital cooperation and transformation are aligned with societal values, educational equity, and sustainable development.

From a policy perspective, it highlights the importance of aligning national AE strategies informed by international frameworks, to ensure that national actions are both globally coherent and locally effective with the operational realities and innovation capacities of HE institutions, promoting human capital development, ethical governance, and sectoral innovation. Noting that these strategies often lack clear implementation pathways within the HE sector, this paper presents a series of recommendations for the creation of national AI–HE coordination mechanisms, the adoption of institutional AI charters, and strategic investment in digital public goods and digital public infrastructure.

On the capacity-building front, it identifies a growing momentum within HE institutions to foster AI literacy, pedagogical innovation, and inclusive digital ecosystems. Case studies from across the region illustrate how universities are embedding AI into curricula, training educators, and promoting interdisciplinary research. Algeria's University 4.0 transition, among others, demonstrates scalable models for institutional transformation. The paper calls for structured capacity-building programmes targeting both students and educators, including micro-credentials, continuous professional development, and support for communities of practice. These efforts must be reinforced by policy environments that recognise HEIs as pivotal actors in national and regional digital transformation.

The paper key findings include:

- **AI is a catalyst for institutional transformation,** with countries like Algeria, Egypt, and Italy embedding AI into national education strategies.
- **Capacity building is a regional priority,** focusing on AI literacy for students, educators, and researchers.
- **Ethical AI use and data governance** are central to policy development, with frameworks like the PIO Model and UNESCO guidelines guiding implementation.
- **Digital cooperation is expanding,** with initiatives supporting multilingual learning, virtual mobility, and cross-border curriculum development.

Crucially, this paper positions HE as a strategic interface between international digital cooperation objectives and national innovation systems, advocating for the co-creation of a **Mediterranean Digital Education Charter** to harmonise ethical principles, data governance standards, and the use of open practices, including Open Data and Open Educational Resources (OER) across borders. By linking global commitments, national priorities, and institutional practices, it outlines a **roadmap** for an open, responsible, inclusive, and future-oriented AI transformation in Mediterranean HE.

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Case 9: Fostering Inclusive AI in Mediterranean Higher Education: A Case Study on Chatbot-Mediated EFL Instruction

Keywords: *Artificial Intelligence; Universal Design for Learning; Accessibility; Inclusive Education; English as a Foreign Language*

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Laura Fedeli is a full professor in Didactics and Special Pedagogy at the University of Macerata, Italy. She holds an MSc in Instructional Technology and Distance Education (USA) and a PhD in E-Learning, Knowledge Management, and Psychology of Communication. Her research focuses on Universal Design for Learning, teacher training, instructional design, and educational technology with an emphasis on inclusive practices. Key publications include analyses of ICT in special needs teacher training and teachers' perceptions of technology for inclusion.

Francesca Raffi is Associate Professor of English Translation at the University of Macerata and Honorary Fellow at the University of Liverpool. Co-director of the international Master's course in Accessibility to Media, Arts and Culture (AMAC), her research covers re(translation), linguistic and sensorial accessibility, and reception studies. Actively involved in accessibility projects, she coordinates the national UNITE project at Macerata, exploring chatbot-based systems for inclusive EFL teaching through the Universal Design for Learning framework to improve accessibility and learning outcomes.

Level of initiative: Institutional; Faculty; Department; Course-level
Type of Initiative: Capacity-building courses; Policy Implementation; AI Literacy Guides; Assessment
Methods; Conferences/Seminars/Workshops; AI-enhanced Teaching & Learning Practices
Target audience: Students; Academics; Institutional leaders

Rationale & Background

This initiative explores the pedagogical potential of AI-powered chatbots in university-level English as a Foreign Language (EFL) instruction, through the lens of the Universal Design for Learning (UDL) framework. It arises in response to the increasing demand for inclusive, adaptable, and accessible educational environments in HE, particularly for students with disabilities, specific learning disorders, and other forms of neurodiversity (ANVUR & CNUDD, 2020). As AI tools such as chatbots gain popularity in academic settings, there is a pressing need to assess their alignment with inclusive teaching principles and their capacity to support diverse learners.

The initiative is part of the Italian national research project UNITE, which promotes digital and inclusive innovation in education through the integration of emerging technologies. Specifically, the study investigates how AI-based dialogue systems can be designed and evaluated in accordance with UDL principles—offering multiple means of engagement, representation, and action/expression—to meet the varied needs of EFL learners.

A key output of the project is the development of the Chatbot Accessibility Guidelines, designed to

assess the inclusiveness of AI-driven chatbots used in language learning. These guidelines respond to concerns regarding usability, accessibility, emotional engagement, and potential cognitive overload or bias in chatbot interactions. Drawing from established research in chatbot design (Johari & Nohuddin, 2021; Borsci et al., 2022; Silva & Canedo, 2022) and digital accessibility (Stanley et al., 2022), they provide educators and instructional designers with actionable criteria for evaluating AI tools.

In the broader Mediterranean and European context of responsible AI adoption, this initiative contributes to the ethical integration of educational technologies. It emphasises equity, learner diversity, and pedagogical integrity, ensuring that technological innovation in HE fosters—not hinders—access and inclusion.

Description of the Initiative

The initiative focuses on the pedagogical and inclusive potential of AI-powered chatbots in university-level EFL instruction, aiming to align their design and implementation with UDL principles. At the heart of the initiative is the development of the Chatbot Accessibility Guidelines, a structured tool grounded in UDL that offers evaluative criteria for the inclusive use of AI-based chatbots. These guidelines are designed to assess the extent to which chatbots support diverse learner profiles, particularly in relation to engagement, clarity of interaction, adaptability, cognitive accessibility, and user control. Each descriptor maps onto the three pillars of the UDL framework - multiple means of engagement, representation, and action and expression - ensuring a comprehensive and learner-centered evaluation model.

The development of the guidelines was informed by an applied study involving university students enrolled in EFL courses. Participants interacted with two conversational agents—ChatGPT 3.5 and Pi.AI—through task-based language learning activities. After these sessions, students completed a post-task questionnaire assessing perceived levels of cognitive load, emotional engagement, accessibility, and potential discomfort or bias during the interaction. These findings provided qualitative and quantitative insights into the affordances and limitations of chatbot-mediated language learning, which were directly integrated into the guideline refinement process.

To ensure theoretical rigor and practical applicability, the guidelines were further validated through consultation with CAST (Center for Applied Special Technology), the organisation responsible for developing and disseminating the UDL framework internationally. This collaboration ensured alignment with current accessibility standards and educational best practices. Beyond the research dimension, the initiative includes a strong capacity-building component. Internal training sessions and targeted workshops were organised for faculty, instructional designers, and teaching assistants. These activities aimed to enhance AI literacy, promote awareness of ethical and inclusive practices in the use of AI, and foster critical reflection on how emerging technologies can reshape language teaching and learning. Also, the initiative produced a set of AI Literacy Guides tailored to foreign language educators, providing practical strategies for integrating AI tools like chatbots into course design, emphasising accessibility, learner autonomy, and pedagogical alignment. The guides are designed to be scalable and adaptable across different institutional contexts and languages.

Finally, the project contributes to institutional policy dialogue by offering recommendations and dissemination materials to inform department- and faculty-level strategies on inclusive digital innovation. These outputs aim to inspire further initiatives and cross-disciplinary collaborations on responsible AI use in education.

Taken together, the initiative not only advances research on inclusive chatbot design but also fosters institutional change through training, policy support, and the co-construction of knowledge between researchers, educators, and students.

Table 1: Chatbot Accessibility Guidelines – Key UDL-Based Criteria

Principle	Example Guideline	Priority
Multiple Means of Engagement	*Encourages active participation.*	*2*
Multiple Means of Engagement	*Allows flexible instructional content aligned with student needs.*	*2*
Multiple Means of Engagement	*Provides action-oriented feedback with relevant examples.*	*3*
Multiple Means of Engagement	*Adapts outputs to learner skills and objectives.*	*4*
Multiple Means of Engagement	*Helps learners develop internal coping strategies.*	*4*
Multiple Means of Representation	*Presents content in multiple formats (text, audio, etc.).*	*5*
Multiple Means of Representation	*Supports linguistic and cultural diversity.*	*4*
Multiple Means of Representation	*Ensures clarity and accessibility of chatbot language.*	*4*
Multiple Means of Representation	*Includes multimodal inputs to enhance understanding.*	*3*
Multiple Means of Action & Expression	*Allows students to respond using different formats (text, audio, etc.).*	*4*
Multiple Means of Action & Expression	*Supports alternative ways to complete tasks.*	*3*
Multiple Means of Action & Expression	*Provides scaffolding for task completion.*	*3*
Multiple Means of Action & Expression	*Includes tools for tracking progress and self-reflection.*	*3*

Table1 summarises the key principles of the chatbot accessibility checklist developed within the UNITE project. The checklist is grounded in the UDL framework and is organised around its three core pillars: Multiple Means of Engagement, Representation, and Action & Expression. Each guideline reflects how AI-powered chatbots can be evaluated and designed to support inclusive, accessible, and personalised learning experiences for EFL students. The priority score (1–5) indicates the relative impact of each criterion on accessibility, as assessed by the project team and validated in collaboration with CAST (Center for Applied Special Technology, USA).

Outcomes & Impact

The ongoing initiative has already yielded significant preliminary results, laying the groundwork for future institutional adoption and wider educational impact.

At its core is a quasi-experimental study involving 326 Italian university students (aged 19–25) enrolled in EFL courses. Participants varied in proficiency (beginner to advanced) and included students with disabilities and learning disorders, ensuring a diverse and representative sample. Each completed three interactive tasks—small talk, open-topic conversation, and role play—using ChatGPT 3.5 and Pi.AI. Afterward, they filled out a questionnaire on emotional engagement, clarity, cognitive load, and inclusiveness. The responses directly informed the development of the Chatbot Accessibility Guidelines, aligning learner feedback with evaluative criteria.

Although still under refinement, early feedback on the guidelines suggests their potential for assessing chatbot inclusivity. Plans are in place to pilot them in two more departments next year, in collaboration with university inclusion and innovation offices.

Concurrently, the initiative includes training workshops for instructors, teaching assistants, and instructional designers. These will explore both the pedagogical opportunities and ethical issues tied to AI integration in EFL teaching. Themes include Universal Design for Learning (UDL), accessible AI tool evaluation, chatbot-based task design, and strategies to prevent algorithmic bias. Participants will reflect on their practices and co-create inclusive, AI-supported learning scenarios. Beyond training, these workshops will serve as communities of practice, promoting dialogue on responsible tech use and fostering inclusive innovation across departments.

A potential institutional outcome is the use of the guidelines by Disability Services to train tutors in supporting students' use of AI for study, review, and exams. The initiative thus aims to influence both research and policy, ensuring equitable, responsible implementation of AI in HE.

Links & Additional Resources

PRIN UNITE Project https://site.unibo.it/unite/en

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