



Transforming Italian FL Education: AI-Driven Personalisation and Teacher Digital Literacy in the DAI Project

Leonard Busuttil¹, Clifton Casha Brincat², Sandro Caruana³, Mario Pace⁴

^{1, 2, 3, 4} University of Malta, Malta

Abstract

Traditional language learning tools have frequently relied on a "one-size-fits-all" approach, lacking the adaptive capabilities necessary to meet diverse student needs. The DAI (Developing an AI-assisted Italian Language Teaching and Learning System) project moves beyond traditional models and addresses this gap by integrating Artificial Intelligence into Italian as a Foreign Language (FL) instruction. This initiative aims to develop critical thinking and evaluative skills by deploying a personalised, AI-based training package for international students of Italian and establishing a comprehensive learner corpus to fuel future research in AI-driven language pedagogy. However, the successful implementation of such AI-driven platforms relies heavily on the digital competencies of the educators steering them. To this intent, the DAI project features a dedicated training course designed to equip teachers of Italian with essential AI and digital skills. This paper focuses on two core dimensions of the project: its overarching scope and rationale, and a detailed examination of a specific module, titled "Integrating Digital Resources", which is currently being piloted. This module (module 3) is central to the project's objective of transforming teaching practices. It provides educators with practical methodologies and pedagogical frameworks to embed AI-based resources, including interactive modules and a personalised content-retrieval chatbot, into their curricula. By exploring the development and pedagogical architecture of the module, this presentation demonstrates how theoretical AI applications are translated into actionable teaching strategies. Ultimately, we argue that equipping teachers with these targeted digital competencies is just as vital as the technology itself, ensuring that AI serves as an effective, sustainable catalyst for Italian FL teaching and learning.

Keywords: *AI in language education, Italian as a Foreign Language, teacher digital literacy, personalised learning, digital resource integration.*

1. Introduction

The landscape of foreign language (FL) education has undergone a structural paradigm shift over the past two decades. These include moves towards plurilingual pedagogies [1] and language mediation [2]. Moreover, driven by the rapid acceleration of educational technologies, language education has also merged communicative methodologies with technology-enhanced language learning (TELL) environments [3]. The role of the language teacher, whose professional expertise can no longer be decoupled from digital competence, is central to this evolution.

The contemporary conceptualisation of educator digital competence extends far beyond functional computer literacy. As digital tools evolve from peripheral aids to fundamental operational environments, domain-specific frameworks of digital competencies have been developed. The Digital Competence Framework for Citizens (DigComp) underpins this domain, having been extended for educators through DigCompEdu [4]; DigComp itself has since been updated to a fifth edition, DigComp 3.0 [5], integrating artificial intelligence, digital rights and wellbeing systematically across its competence areas, rather than as a separate strand. DigCompEdu identified key areas spanning several competences, amongst which using digital resources for communication, collaboration, assessment and professional development, as well as assisting learners in navigating digital environments critically and creatively. More recently, UNESCO [6] published the *AI Competence Framework for Teachers* (CFT), to redefine teacher-student relationship into a human-centered teacher-AI-student dynamic. Language-specific frameworks have a longer history: the TESOL Technology Standards [7] established distinct standards for language learners and teachers, with performance indicators for technology use in language classrooms, while more recently the *Digital Competence for Language Teachers (DC4LT) framework* [8] addresses the digital needs of language educators. Unlike generic digital frameworks, it connects technology use with Computer-Assisted Language Learning (CALL) methodologies and second language acquisition. For foreign language educators, these general competencies intersect directly with Technological



Pedagogical Content Knowledge (TPACK) frameworks [9]. In FL contexts, digital competence entails the ability to curate authentic target-language input, design interactive computer-mediated communication (CMC) tasks, manage digital corpora and employ automated feedback tools effectively. The use of AI in these contexts is however still underexplored and a gap remains between teacher technical fluency and true pedagogical integration. While many educators possess functional skills, state-of-the-art scholarship (e.g. [4]; [10]) highlights the need for further 'pedagogical digital competence', namely the critical capacity to select, adapt, and deploy digital tools to intentionally serve specific language learning outcomes. This entails moving from passive technology consumers to active computational prompters. Designing structured system prompts for Large Language Models (LLMs) allows teachers to generate level-appropriate target texts, construct context-rich roleplays, and create differentiated learning materials in seconds. Furthermore, as automated systems take on greater instructional roles, teachers require critical literacy to evaluate bias, hallucination, and privacy compliance in digital tools, ensuring safe and ethical integration in accordance with regional regulations, such as the EU AI Act [11]. Future digital competence demands that teachers interpret automated diagnostic dashboards to identify learner friction points, track longitudinal vocabulary acquisition, and deliver targeted interventions. Against this background, the DAI project provides a concrete context in which to examine how pedagogical digital competence can be developed specifically for teachers of Italian as a Foreign Language, and how AI-based resources can be integrated into teaching without displacing the teacher's pedagogical role.

2. Artificial Intelligence as a Sustainable Catalyst for Italian FL Pedagogy

In Italian foreign language teaching and learning, the integration of Artificial Intelligence represents a significant evolution in methodology. Historically, Italian FL pedagogy outside of Italy has faced structural constraints, including limited classroom contact hours, variable access to authentic native linguistic environments, and challenges in scaling individualised writing and oral practice [12]. Generative AI and adaptive learning models could potentially solve some of these problems.

Recent empirical investigations highlight the impact of conversational AI systems in Italian L2/LS contexts. For example, research conducted by Cinganotto and Montanucci [13] evaluated AI-driven dialogue systems trained on corpora aligned with the *Italian Language Profile* [14]. Their findings demonstrate that interactive AI systems provide learners with low-anxiety opportunities for real-time conversational simulation, resulting in measurable gains in written production, receptive skills, and communicative confidence. The integration of generative tools allows educators to generate dynamic, authentic linguistic inputs tailored to specific proficiency tiers along the Common European Framework of Reference for Languages [15]. By leveraging LLMs alongside natural language processing (NLP) corpora, educators can produce varied context-bound exercises such as target-level simulations of contemporary Italian media, idiomatic discourse practices, and complex grammatical structures (e.g., the nuance of the *congiuntivo* vs. *indicativo*). Furthermore, empirical research on AI-driven personalised language learning emphasises its psychological benefits. Yan et al. [16] demonstrate that AI-based adaptive feedback and task scheduling significantly enhance learner pleasure and self-efficacy while mitigating foreign language anxiety, establishing a psychological baseline conducive to sustained acquisition.

For AI to act as a sustainable catalyst in Italian FL education, it must enhance learning outcomes without inflating teacher burden or replacing the essential sociocultural dimensions of language instruction. If used effectively, AI automates instructional design tasks like creating differentiated reading comprehension sets, providing prompts for oral interaction and offering opportunities for learner self-evaluation. Educators could therefore focus more on high-value human interactions such as facilitating intercultural dialogues, fostering authentic collaborative tasks and providing mentoring.

The digital transformation of language education demands an updated understanding of educator competencies. Rather than competing with human instruction, AI technologies, when paired with well-developed pedagogical digital competence, offer a flexible, scalable, and sustainable framework for Italian foreign language teaching. By validating the role of AI through recent empirical literature, these reflections set the stage for presenting a targeted training module designed to empower Italian language educators to integrate AI tools purposefully, ethically, and effectively in modern L2/LS contexts.



3. The DAI¹ Project Architecture: Bridging AI Innovations and Pedagogical Practice

While theoretical frameworks underline the necessity of upgrading language educators' digital competencies, operationalizing these paradigms requires structural scaffolding that translates AI capabilities into real-world pedagogical environments. The DAI (Developing an AI-assisted Italian Language Teaching and Learning System) project directly bridges the gap between teacher technical fluency and true pedagogical integration by constructing an ecosystem designed to personalise student learning while systematically building educator digital literacy.

Building on the challenges outlined above, the DAI project translates the potential of AI-assisted language learning into a structured educational ecosystem. Rather than treating technology as a passive auxiliary tool, DAI combines adaptive learning resources with targeted teacher development, thereby addressing learner personalisation and educator digital competence as interdependent dimensions of AI-enhanced language education.

The primary objective of DAI is to transform Italian FL instruction through the targeted implementation of AI technologies. To achieve a sustainable transformation, the project simultaneously targets two direct beneficiary groups: teachers of Italian as a Foreign Language and international academic students seeking to acquire target-language proficiency. For international students, the project delivers an adaptive, personalised learning experience designed to mitigate foreign language anxiety, enhance communicative confidence, and optimise individual acquisition paths. For language educators, the project offers targeted training to upgrade digital and AI skills, enabling teachers to transition from traditional knowledge transmitters into intentional designers of tech-enhanced learning environments.

To achieve these aims, the DAI consortium has established four interconnected primary outcomes. First, it offers a structured 7-module online teacher training course focused on AI integration across language learning, teaching, and assessment, equipping educators with practical frameworks (such as TPACK and DigCompEdu) to deploy AI ethically and effectively. Second, it features an interactive online learning platform containing self-paced modules to deliver personalised language training tailored to individual proficiency tiers and learner pacing. Third, the project creates a dedicated resource repository featuring a customised, personalised chatbot for content retrieval, providing automated target-language input, contextualised dialogue simulations, and targeted material curation. Finally, it gathers a comprehensive learner corpus derived from student interactions within the online course, supplying a rich empirical dataset to fuel future research in AI-assisted second language acquisition and pedagogy. The overall architecture of the DAI project is explicitly engineered so that technological systems and pedagogical competence reinforce one another. The multi-module teacher training course acts as the primary vehicle for operationalizing this strategy. Hosted asynchronously on Moodle, the curriculum covers seven core domains distributed across consortium partner institutions: AI Foundations in Language Education developed by UniStraPG, Designing AI-Enhanced Learning by UniSkopje, Integrating Digital Resources by UniMalta, Inclusive and Adaptive Teaching by GUFrankfurt, Data-Driven Teaching Strategies by UniHamburg, Ethical and Critical AI Use by UniValencia, and Practical Applications by UniStraPG.

Within this sequential framework, Module 3, titled "Integrating Digital Resources", serves as the crucial pivot point between abstract technological principles and concrete classroom execution. Having established theoretical foundations in Modules 1 and 2, in Module 3 educators encounter the immediate practical decision of which digital tools to select, when to introduce them, and how to configure them for specific pedagogical outcomes. The following section provides a detailed examination of Module 3's development, structural constraints, and three-pillar pedagogical architecture.

4. Module 3: Integrating Digital Resources

4.1. Position within the Course Architecture and Intended Audience

Within this seven-module architecture, Module 3, Integrating Digital Resources in AI-Enhanced Teaching, occupies a deliberate transitional position. It follows the conceptual grounding of Module 1 and the design principles of Module 2, and precedes modules addressing differentiation, learning analytics and ethics in greater depth. Our remit was the point of contact between the two: the moment

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at which a teacher of Italian as a foreign language stops discussing artificial intelligence in the abstract and has to decide which resource to open, at which point in a lesson, and to what pedagogical end.

The module is addressed to academic teachers of Italian as a foreign language, one of the project's two direct target groups. This audience is characterised less by a deficit of pedagogical expertise than by a mismatch between well-developed subject knowledge and uneven confidence with emerging digital tools. The module accordingly assumes fluency in the language being taught and familiarity with core methodological concepts, and it verifies rather than teaches that baseline: the pre-knowledge test opens by asking participants to identify scaffolding, the disadvantage of delayed written feedback, the function of a basic spell-checker, the practical obstacle to assessing thirty learners' speaking individually within a forty-five-minute lesson, and the purpose of formative assessment. Each of these five items is a concept the module later repurposes in an AI-mediated form, so the pre-test doubles as a diagnostic and as an advance organiser.

Delivery is asynchronous. The course is hosted on Moodle and studied at the participant's own pace, with a certificate awarded on completion. This has consequences for design that we return to below: with no tutor present at the point of study, every explanatory move, every demonstration and every corrective feedback message has to be anticipated and written into the materials themselves.

4.2. The Development Process and its Constraints

The consortium adopted a common template for module documentation across all seven modules, and this shaped our work in a way worth reporting. The template fixed the descriptive apparatus (abstract, learning objectives, a tripartite statement of knowledge, skills and competences, video specifications, activity types, glossary) and it fixed the media parameters: four videos of approximately fifteen minutes each, rendered as H.264 MPEG-4 at 720p. All partners were bound by these parameters, which had been agreed jointly by the consortium. Working within a shared template imposed a productive discipline. It guaranteed that a participant moving from Module 2 to Module 3 to Module 4 would meet the same structural signposts, the same granularity of objective statement and the same species of end-of-module test, which matters considerably in a self-paced environment where structural predictability substitutes for the orienting work a tutor would otherwise do.

The constraint also created a tension we had to resolve. Fifteen minutes is well beyond the six-minute threshold above which engagement with instructional video is known to decline sharply [17]. We addressed this not by shortening the videos, which was not open to us, but by segmenting them internally. Each video is divided into five or six explicitly timed parts, each running between two and four minutes, and each part is built around a single claim, a single demonstration or a single strategy. This is the segmenting principle of multimedia learning applied inside a fixed container [18]: the learner is given repeated natural stopping points, and the accompanying materials are keyed to those parts rather than to the video as a whole. The scripts also alternate systematically between slide-based exposition and screen recording, so that the modality shifts roughly every two to three minutes.

Development followed a broadly ADDIE-shaped sequence of analysis, design, development, implementation and evaluation [19], with the design phase organised backwards from the intended outcomes [20]. We began from the four learning objectives, each of which is stated as a performance the participant should be able to execute rather than as content they should have encountered: to select and apply AI-based assessment tools while distinguishing auto-marking from AI evaluation; to design an activity using real-time feedback mechanisms; to create a back-translation or critical editing task; and to plan a lesson integrating immersive technologies with the explicit aim of lowering learner anxiety. The tool inventory, the activities and the assessment items were then derived from those four statements, rather than the objectives being written retrospectively to describe a set of tools we happened to like. The distinction matters, because the most common failure mode in technology-focused teacher training is the tool tour: a sequence of demonstrations with no organising pedagogical claim.

The completed module underwent internal review at the responsible institution, followed by peer review by the other consortium partners and formal sign-off. It is currently being piloted, ahead of full delivery to teachers. We therefore report here on the design and its rationale rather than on evaluation outcomes; the empirical questions raised by the design are set out in the closing part of this section. With these development parameters established, the discussion can now turn from the module's design process to the pedagogical architecture that organises its content.

5. Pedagogical Architecture: Three Pillars and a Governing Metaphor



The module's organising claim is stated in its opening minutes and repeated in its closing ones: the goal is augmented intelligence, not automation. The scripts name and reject the alternative explicitly, and the fourth video reinstates the point in Italian as the *docente potenziato*, the augmented teacher who uses technology to amplify empathy, motivation and creativity while delegating mechanical and repetitive correction. This is not decorative framing. It supplies the criterion by which every tool in the module is judged, and it determines what participants are asked to do with each one: not to hand over a task, but to redistribute it.

From that governing claim, the module derives three pillars, which map onto the first three videos and are consolidated in the fourth: intelligent assessment, real-time correction, and mediation and translation. The three are sequenced along a temporal axis that we found to be the most intuitive organising logic for practising teachers. Pillar one concerns what happens after production, when work has been submitted and must be evaluated. Pillar two concerns what happens during production, at the moment of writing or speaking. Pillar three concerns what happens before and around production, when the learner is deciding what to say and reaching for a tool to help them say it. Together, the three pillars form a progression from assessment, through correction, to improvement.

In competence terms, the module targets the areas of the European Framework for the Digital Competence of Educators that concern assessment, feedback and the empowerment of learners [4], and it is constructed so that technological knowledge is never presented in isolation from pedagogy and content, in keeping with the TPACK account of teacher knowledge [9]. Every tool in the module is introduced through a language-teaching problem it addresses. Grammarly Insights is introduced through the question of whether a learner's Italian is not merely correct but effective for its audience; Microsoft Reading Coach through the impossibility of assessing thirty learners' pronunciation individually within a single lesson; Reverso Context through the observation that an idiom has several defensible renderings depending on situation. The competence statements make the intended terminus explicit: the participant is to move from being a transmitter of knowledge to being a designer of learning experiences.

5.1. Pillar One: Intelligent Assessment and the Hybrid Correction Workflow

The first video opens on what it names the correction burden, and it makes a conceptual distinction that recurs throughout the module and in three separate assessment items: auto-marking, which returns a binary verdict on a closed response, is not the same thing as AI evaluation, which analyses syntax, tone, complexity and style. The distinction does real work. It allows participants to see why a multiple-choice quiz platform and a writing analysis tool belong to different assessment categories with different validity claims, and it inoculates against the assumption that automated grading is a single undifferentiated capability.

The practical core of the pillar is the Hybrid Correction Workflow, a four-step procedure that is modelled step by step on screen and is designed to produce richer feedback on a student text in under a minute. Step one is a short screen recording in which the teacher reads the text aloud and names one substantive issue of argument or meaning. Step two is a check with an AI detection tool, framed not punitively but diagnostically, as a voice check on whether the learner has done their own work; where the text returns as entirely machine-generated, the feedback is simply to rewrite it in the learner's own voice, and the workflow stops there. Step three uses a supplied prompt to obtain a structured analysis from a general-purpose assistant. Step four returns the teacher to the text for a personal closing comment.

The sequencing is the pedagogical argument. Human presence comes first and last, and the machine occupies the middle, which is precisely the inverse of the arrangement teachers most fear. The workflow is also a concrete answer to a familiar objection to automated writing evaluation, namely that computer-generated feedback tends to address surface features while leaving higher-order concerns untouched [21]. Here the division of labour is deliberate rather than accidental: mechanical accuracy is delegated, and the teacher's attention is reserved for meaning, argument and voice.

The pillar closes by drawing out the aggregate consequence. When assessment is instrumented, the teacher gains a class-wide diagnosis rather than an accumulation of individual impressions, and can plan the following lesson against evidence rather than intuition. The module states this as a shift from reactive to proactive practice and anticipates, without duplicating, the treatment of data-driven instruction that follows in a later module.



5.2. Pillar Two: Closing the Feedback Loop

The second pillar rests on a claim from second language acquisition research that is stated in the first video and developed in the second: feedback that arrives a week after the performance it describes has lost much of its value, because the learner no longer has access to the intention behind what they wrote or said, and errors left uncorrected are liable to fossilise [22]. The module names the interval between error and correction the feedback lag and treats its reduction as the pillar's design goal. This aligns the module with the wider evidence that feedback's effect depends heavily on its timing, specificity and the learner's engagement with it rather than on its mere provision ([23]; [24]).

The metaphor chosen for the video is a spotter in a gym: the tool stands behind the learner, intervening at the moment of difficulty so that practice is performed with correct form, rather than performing the exercise on the learner's behalf. Three applications follow. For writing, a style and tone assistant is used to teach register, with participants shown how toggling between simple, business and academic phrasings turns a correction tool into a lesson on style. For speaking, a real-time reading coach highlights mispronunciations and hesitations in colour as the learner reads, and compiles the flagged items into a practice list. The pedagogical argument here is about privacy as much as immediacy: the correction reaches the learner without the class witnessing it, which is a different affective event from being stopped in front of peers.

The pillar's most important contribution, in our view, is its treatment of the failure mode it calls the Accept All problem. A learner who accepts every suggested correction without inspecting it has performed no cognitive work and has learned nothing, and the tool's apparent helpfulness is what makes this outcome likely. The module's response is the Error Log Strategy: for each piece of work, the learner selects one or two substantive corrections and records, in a structured log, the original wording, the correction, and an explanation in their own words of why the original was wrong. The third column is the pedagogical point. It converts a passive act of acceptance into an act of explicit noticing and articulation, and it produces a longitudinal record of the learner's own error patterns. This is the module's clearest instance of its general method: identify the way a tool invites misuse, then design an activity that makes the productive use the path of least resistance.

The pillar closes with immersive environments, introduced through Krashen's affective filter [25]. The claim, that learners take more linguistic risks with an avatar than with a teacher or peers because the fear of judgement is removed, is presented as a hypothesis with pedagogical consequences rather than as a settled result, which is appropriate given that the evidence on high-immersion virtual reality and foreign language anxiety, while encouraging, remains limited in scale [26].

5.3. Pillar Three: from Passive Consumer to Active Editor

The third pillar addresses machine translation, which the module frames as the elephant in the language classroom, and it makes the module's boldest pedagogical move: rather than policing a prohibition that is in practice unenforceable, it teaches critical use. The target transformation is stated as a shift from passive consumer to active editor, a formulation close to what the translation studies literature calls machine translation literacy [27] and consonant with the finding that three decades of research on machine translation in language education has moved steadily from prohibition towards structured integration [28].

Two methodologies carry the pillar. The Compare Strategy is demonstrated live on four Italian expressions of increasing difficulty. Three are handled correctly by a general-purpose translation engine, and the fourth, *arrampicarsi sugli specchi*, is not: it yields a literal and nonsensical rendering rather than the English idiom grasping at straws. A neural alternative handles it correctly, and a contextual tool then shows the phrase in authentic use across multiple registers. The demonstration is constructed so that the failure arrives fourth, after the tool has established its credibility, which is precisely the epistemic situation learners face and precisely why blind acceptance is tempting.

The Back-Translation Challenge converts the insight into a thirty-minute classroom activity for A2 to C1 learners. Learners draft a short text in their first language under a constraint, such as the compulsory inclusion of an idiom, translate it into the target language with one tool, then pass only the translation to a partner who has not seen the original and who translates it back using a different tool. The comparison of the final text with the original makes the losses visible: whether the idiom survived, whether the register shifted. The activity is well designed in a specific sense. The learning is produced by the discrepancy itself rather than by a teacher's assertion, which is why the blind swap matters procedurally, and it requires no specialist infrastructure beyond freely available tools.



The pillar extends the same logic outward to augmented reality translation of physical realia, where the pedagogical claim is that the learner remains inside the cultural context of the object instead of leaving it to type into a search box, and to AI dubbing, where learners record a presentation in their first language and hear and see a fluent version of themselves in the target language. Across the three pillars, the pedagogical logic is therefore consistent: AI is not introduced as a substitute for learner or teacher judgement, but as a resource whose value depends on the critical activity designed around it.

6. The Interactive Layer and the Ethical Frame

While the three pillars organise the module's substantive content, an interactive and ethical layer cuts across all three and determines how participants engage with that content. Interactivity in the module is carried by its assessment and activity architecture, which is embedded in the module document itself and instantiated in Moodle. Five activity types are specified: a pre-knowledge test, a set of true or false statements, a matching quiz pairing eight key terms with their definitions, a fill-in-the-gaps exercise, and a ten-item end-of-module test. Two features of this layer are worth noting. First, feedback is written for both outcomes on every item, and the true or false activity additionally records, for each statement, the common misconception that makes the wrong answer attractive. In an asynchronous course this is the mechanism by which the tutor's explanatory voice is preserved. Second, the items are consistently anchored to the demonstrations rather than to abstract statements of principle: participants are asked which Italian phrase exposed the translation failure, what the second step of the correction workflow is for, and how the reading coach signals hesitation. Retrieval is thus tied to the specific episode in which the concept was encountered. The example activities close the loop back to practice by asking participants to apply the workflow to a sample paragraph, complete an error log, and run the back-translation challenge with a partner.

The ethical frame is delivered as three red lines rather than as a general exhortation: no personally identifiable information in public tools, with placeholders used instead; no uploading of texts containing personal disclosures, which are to be marked manually; and the assumption that anything entered into a free tool may be used to train the model, which rules out confidential material such as unreleased examination papers. Presenting these as bright-line rules attached to concrete teacher actions, rather than as principles, follows the approach of the European Commission's guidance for educators on the ethical use of AI and data [29] and makes the constraints operable at the point of use. Both the module and its concluding video place these within the terminal goal of AI literacy, understood as the capacity to use these systems with awareness of their limitations, biases and ethical implications ([30]; [31]), a formulation that aligns closely with the teacher competencies set out by UNESCO [6].

A final design decision concerns language. The first three videos are delivered in English and the fourth, the synthesis, in Italian. The choice is deliberate: the module's conceptual vocabulary is introduced in the shared working language of the consortium and then restated in the language the participants teach, so that they acquire the terminology in the form they will need when speaking to colleagues and learners. The Italian video is not a translation of its predecessors but a consolidation, mapping the three pillars onto one another and closing on the redefinition of the teacher as a designer of learning rather than a transmitter of knowledge.

7. Discussion and Concluding Reflections

Taken together, the design of Module 3 illustrates the broader principle underpinning the DAI project: the educational value of AI does not reside in the availability of increasingly sophisticated tools alone, but in teachers' capacity to select, configure and critically mediate those tools in relation to specific learning objectives. The three-pillar architecture translates this principle into practice by positioning AI across different stages of language production while retaining teacher and learner judgement at the centre of the process. In this sense, pedagogical digital competence is not an ancillary condition for AI-enhanced language education but one of its constitutive requirements [6].

Expanding this framework to the macro-level of foreign language policy and curriculum design (e.g. [5]; [5]), the DAI project demonstrates how structured teacher professional development can bridge the persistent gap between technological innovation and classroom reality. Rather than positioning AI as a disruptive force that threatens traditional humanities instruction, generative technologies are embedded within established SLA principles, such as noticing, formative feedback loops, and affective scaffolding [32]. By formalising these practices into actionable teacher competencies, institutions can foster



sustainable digital transformation across language programmes without compromising human-centred, communicative methodology [6].

Furthermore, the integration of targeted AI modules underscores the urgent need for institutional policy to align with evolving classroom practices [7]. As tools like machine translation and automated diagnostic engines become commonplace, educational institutions are called to shift from reactive prohibitions to proactive literacy frameworks. The pedagogical strategies presented in Module 3, including back-translation challenges and explicit error logging, offer examples of how institutional guidelines that foster academic integrity, ethical awareness and student agency can be developed.

Two limitations follow from the design. The module commits to specific commercial tools, several of which restrict their most useful features to paid tiers and any of which may change materially within the project's lifetime; the strategies are portable but the demonstrations are not, and sustainability will depend on maintaining the resource repository rather than the videos. Second, the module makes effectiveness and efficiency claims, notably about reduced correction time and lowered anxiety in immersive practice [16], that the pilot now under way is well placed to test. These are the questions we intend to put to the pilot data.

The ongoing pilot will provide the empirical basis for evaluating whether these design principles translate into changes in teacher confidence, practice and perceived efficiency. At this stage, however, the module offers a concrete model for moving beyond both uncritical technological adoption and blanket resistance to AI. Its central proposition is that sustainable AI integration in Italian FL education depends on developing not automated classrooms, but digitally competent teachers capable of making informed pedagogical choices.

REFERENCES

- [1] Chen, L., Karas, M., Shalazar, M., & Piccardo, E. (2022). From "Promising Controversies" to Negotiated Practices: A Research Synthesis of Plurilingual Pedagogy in Global Contexts. *TESL Canada Journal*, 38(2), 1–35. <https://doi.org/10.18806/tesl.v38i2.1354>
- [2] Piccardo, E. (2022). Mediation and the plurilingual/pluricultural dimension in language education. *Italiano LinguaDue*, 14(2), 24-45. <https://doi.org/10.54103/2037-3597/19568>
- [3] Hasumi, T., & Chiu, M. S. (2024). Technology-enhanced language learning in English language education: Performance analysis, core publications, and emerging trends. *Cogent Education*, 11(1). <https://doi.org/10.1080/2331186X.2024.2346044>
- [4] Redecker, C. (2017). European Framework for the Digital Competence of Educators: DigCompEdu (Y. Punie, Ed.). Publications Office of the European Union. <https://doi.org/10.2760/159770>
- [5] Cosgrove, J., & Cachia, R. (2025). DigComp 3.0: European Digital Competence Framework – Fifth Edition. Publications Office of the European Union, Luxembourg. <https://doi.org/10.2760/0001149, JRC144121>
- [6] Miao, F., & Cukurova, M. (2024). AI competency framework for teachers. UNESCO. <https://doi.org/10.54675/ZJTE2084>
- [7] Healey, D., Hanson-Smith, E., Hubbard, P., Ioannou-Georgiou, S., Kessler, G., & Ware, P. (2011). *TESOL Technology Standards: Description, Implementation, Integration*. TESOL Press.
- [8] Fominykh, M., Kakoulli-Constantinou, E., Nicolaou, A., Perifanou, M., Parmaxi, A., Soule, M. V., Shikhova, E., Talmo, T. M., & Zhukova, D. (2022). *Language Teacher Trainer Guide on Digital Competences: Practical instructions and advice on how to organize digital competence training for language teachers*. DC4LT Consortium. <https://www.dc4lt.eu/>
- [9] Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>
- [10] Domínguez-González, M. D. L. Á., Luque de la Rosa, A., Hervás-Gómez, C., & Román-Graván, P. (2025). Teacher digital competence: Keys for an educational future through a systematic review. *Contemporary Educational Technology*, 17(2), Article ep577. <https://doi.org/10.30935/cedtech/16168>
- [11] European Union. (2024). Regulation (EU) 2024/1689 (Artificial Intelligence Act). *Official Journal of the European Union*, L 2024/1689, 12 July 2024. <http://data.europa.eu/eli/reg/2024/1689/oj>
- [12] Diadori, P., Palermo, M., & Troncarelli, D. (2015). *Insegnare l'italiano come seconda lingua*. Carocci editore.



- [13] Cinganotto, L., & Montanucci, G. (2024). L'Intelligenza Artificiale per l'apprendimento dell'italiano L2/LS. Risultati preliminari di una sperimentazione. *Status Quaestionis*, 26, 313–338. <https://doi.org/10.13133/2239-1983/18792>
- [14] Spinelli, B., & Parizzi, F. (2010). Profilo della lingua italiana. Livelli del QCER A1, A2, B1 e B2. La Nuova Italia.
- [15] Council of Europe. (2020). Common European framework of reference for languages: learning, teaching, assessment. Companion volume. Council of Europe Publishing.
- [16] Yan, J., Wu, C., Tan, X., & Dai, M. (2025). The influence of AI-driven personalized foreign language learning on college students' mental health: A dynamic interaction among pleasure, anxiety, and self-efficacy. *Frontiers in Public Health*, 13, Article 1642608. <https://doi.org/10.3389/fpubh.2025.1642608>
- [17] Guo, P. J., Kim, J., & Rubin, R. (2014). How video production affects student engagement: An empirical study of MOOC videos. In *Proceedings of the First ACM Conference on Learning @ Scale* (pp. 41-50). Association for Computing Machinery. <https://doi.org/10.1145/2556325.2566239>
- [18] Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.
- [19] Branch, R. M. (2009). *Instructional design: The ADDIE approach*. Springer.
- [20] Wiggins, G., & McTighe, J. (2005). *Understanding by design* (2nd ed.). Association for Supervision and Curriculum Development.
- [21] Stevenson, M., & Phakiti, A. (2014). The effects of computer-generated feedback on the quality of writing. *Assessing Writing*, 19, 51-65. <https://doi.org/10.1016/j.asw.2013.11.007>
- [22] Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics in Language Teaching*, 10(3), 209-231. <https://doi.org/10.1515/iral.1972.10.1-4.209>
- [23] Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81-112. <https://doi.org/10.3102/003465430298487>
- [24] Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Research*, 78(1), 153-189. <https://doi.org/10.3102/0034654307313795>
- [25] Krashen, S. D. (1982). *Principles and practice in second language acquisition*. Pergamon Press.
- [26] Kaplan-Rakowski, R., & Gruber, A. (2023). The impact of high-immersion virtual reality on foreign language anxiety. *Smart Learning Environments*, 10, Article 46. <https://doi.org/10.1186/s40561-023-00263-9>
- [27] Bowker, L., & Buitrago-Ciro, J. (2019). *Machine translation and global research: Towards improved machine translation literacy in the scholarly community*. Emerald Publishing.
- [28] Jolley, J. R., & Maimone, L. (2022). Thirty years of machine translation in language teaching and learning: A review of the literature. *L2 Journal*, 14(1), 26-44. <https://doi.org/10.5070/L214151760>
- [29] European Commission, Directorate-General for Education, Youth, Sport and Culture. (2022). *Ethical guidelines on the use of artificial intelligence (AI) and data in teaching and learning for educators*. Publications Office of the European Union. <https://data.europa.eu/doi/10.2766/153756>
- [30] Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1-16). Association for Computing Machinery. <https://doi.org/10.1145/3313831.3376727>
- [31] Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence*, 2, Article 100041. <https://doi.org/10.1016/j.caeai.2021.100041>
- [32] Soyoof, A., Reynolds, B. L., Rassaei, E., Kao, C.-W., & van Ha, X. (2026). From teachers to chatbots: Scaffolded corrective feedback and student trust in online L2 English classrooms. *Computers and Education: Artificial Intelligence*, 10, Article 100530. <https://doi.org/10.1016/j.caeai.2025.100530>