# Inclusivity and Innovation at the "Istituto A. Olivetti per L'Innovazione" in Turin

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## Abstract

This research examines the "Istituto A. Olivetti per l'Innovazione" in Turin as a significant case study in integrating inclusive education and technological innovation. Grounded in the Universal Design for Learning (UDL) framework, the educational model prioritizes small class sizes (max. 15 students) and instructional design tailored to diverse cognitive profiles. The study adopts a mixed-methods approach involving a sample of 45 students, including those with certified Specific Learning Disorders (SLDs), Special Educational Needs (SEN), and those at risk of social withdrawal or school phobia. The primary objective is to evaluate the impact of a textbook-free, e-learning environment and Artificial Intelligence (AI) tools on student inclusion and engagement. The methodology triangulates multiple data collection tools to ensure academic rigor: 1) Standardized testing: Using AMOS and QSA batteries to evaluate study strategies and SAS (School Anxiety Scale) to measure emotional impact; 2) Learning Analytics: Quantitative data extracted from the digital platform to monitor autonomous study patterns; 3) Qualitative analysis: Two focus groups with the teaching staff to assess pedagogical shifts. As an ongoing research project currently in its first year, this paper presents preliminary findings regarding the effectiveness of AI-enhanced practices in preventing marginalization. The study contributes to the international debate on educational technology by providing empirical evidence of how digital ecosystems can foster epistemic curiosity and provide essential skills for future academic paths.

*Keywords:* educational innovation, textbook-free pedagogy, AI in education, student-centered education

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## Introduction

This paper is grounded in a necessary analysis of the contemporary Italian school system. It currently exhibits several critical issues, primarily related to overcrowded classrooms within the country's largest educational institutions. Data[1] indicate that numerous class groups do not comply with current safety regulations, while also representing a major driver of school dropout rates among students who require less crowded educational settings and a more personalized learning path.

While this process of adaptation remains systemically hindered for the reasons mentioned above, this cannot and must not serve as a justification for delaying necessary change at the micro-level. Small and medium-sized educational institutions—both public and state-accredited private (*paritarie*) schools—must critically evaluate their own practices and position themselves as pioneers for a long-overdue transformation.

The work of the Istituto "Adriano Olivetti per l'Innovazione," and consequently this study, is situated within this framework, representing the results of an investigation conducted within the institution during the 2025/2026 academic year. Given that this data analysis involves a sample of 45 students, this research does not claim to be exhaustive in any of the aspects examined; rather, it aims to demonstrate the value of an innovative educational approach implemented on a highly localized scale. This sample represents the initial step of an educational community that will hopefully grow in the coming years, gradually providing broader data without imposing an absolute vision of what it means "to do school."

An educational system that fails to remain adaptable to its core components—namely students, teachers, and families—fails to uphold its foundational principle.

To this end, this introduction first provides a brief contextualization of the establishment of the Istituto A. Olivetti, outlining the values and intentions behind its foundation as its inaugural academic year draws to a close. Secondly, it presents an overview of the defining features of the learning activities conducted both at school and at home: a textbook-free approach, the use of a digital learning platform, and the integration of AI tools throughout all educational activities.

The Istituto A. Olivetti per l'Innovazione is a state-accredited private upper secondary school founded with the intention of being a "different" school—without any presumption of being better than others, but with a firm conviction: the specific tool used to build the educational experience is secondary; what matters far more is how it is applied. Hence the decision to develop a textbook-free educational environment, replacing traditional paper textbooks with three integrated pillars. This does not imply that the print-based reading experience is completely discarded. Maryanne Wolf's (2009, 2018) research on "deep reading" has demonstrated that reading on paper remains fundamental for the development of critical thinking and the ability to identify key information within a text.

[1]The legal limits established by Presidential Decree No. 81/2009 (DPR 81/2009) set a cap of 27–30 students for first-year high school classes. According to data from the Single Portal of the Italian Ministry of Education and Merit (MIM), during the 2023/24 academic year, there were 12,593 classes with more than 25 students. Furthermore, these classrooms failed to comply with fire safety regulations regarding the mandated maximum occupancy and emergency outflow index (which limits capacity to 25 students plus the teacher).

The school offers two distinct tracks:

- Liceo delle Scienze Umane opzione economico-sociale (LES): a high school program based on human sciences and economics;
- Liceo Scientifico opzione scienze applicate (LSSA): a curriculum focused on IT subjects, mathematics, and physics.

First, within this textbook-free environment, our teachers are required to design their curriculum in strict alignment with the syllabi (*Programmazioni*) they draft for the current academic year. This allows them to adopt their preferred instructional materials while consistently prioritizing the adaptability of the educational activities carried out with students. Consequently, this approach emphasizes the educational path freely constructed by the teacher for their specific class, while simultaneously tailoring that path to the students' actual proficiency levels, eliminating the need to conform to the rigid structure of a pre-determined textbook. When designing the syllabus, teachers retain the autonomy to utilize whichever materials they deem most appropriate and effective, provided they can be shared digitally with the students.

Second, students have access to an asynchronous e-learning platform, which ensures that all topics covered in class are readily available—subject by subject and year by year—at any point during the school year. The decision to implement a platform to support and extend classroom instruction is fundamental for two primary reasons:

On the one hand, teacher-curated open-source materials flesh out the various topics within the syllabus, aiming to stimulate diverse learning styles that may not all be equally engaged by the varying teaching methodologies of individual instructors.

On the other hand, students who accumulate absences—whether due to health reasons or demanding competitive athletic careers during the school year—are guaranteed more comprehensive support to catch up on the material, moving far beyond the mere assignment of textbook pages to be studied independently at home.

Furthermore, each digital resource is paired with an activity that teachers can assign as homework or as an in-class assessment at the conclusion of a lesson. The adoption of a digital platform also enables the collection of data regarding student progress, academic performance, and satisfaction. The section following this introduction focuses precisely on these preliminary data, gathered both from the platform via end-of-unit quizzes across all subjects and through psychometric self-report questionnaires (AMOS, QSA, and SAS) administered to the students. Finally, in a cultural landscape where AI is increasingly ubiquitous—spanning from everyday contexts to specialized fields—it was deemed essential to incorporate its use into the curriculum, provided it could blend harmoniously with the rest of the aforementioned activities. This does not involve introducing AI as an isolated subject within the school curriculum, but rather integrating it as a study aid and a catalyst for individual curiosity, allowing teachers to approach various topics through an experimental, multifaceted lens. The final chapter, preceding the conclusions of this paper, will present a brief review of how several of our teachers operationalized this integration of AI within their daily teaching practice.

## Data Analysis: AMOS, QSA, SAS, and Digital Assessments

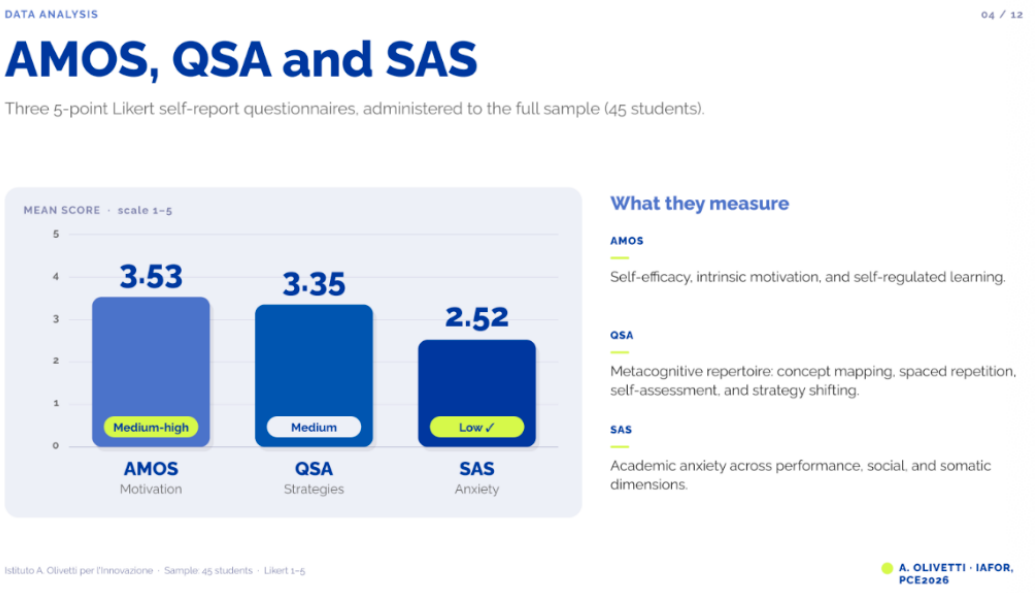
The three self-report questionnaires utilized in this study are briefly described below. Each instrument consists of 15 items scored on a 5-point Likert scale:

- AMOS (*Abilità e Motivazione allo Studio* / Study Skills and Motivation): this instrument investigates students' perceived self-efficacy, intrinsic motivation, and self-regulated learning capabilities (such as planning, distraction management, and progress monitoring). Within the digital ecosystem of the Istituto Olivetti—where students autonomously navigate content on the e-learning platform—self-efficacy and motivational regulation emerge as critical predictors of educational success.
- QSA (*Questionario sulle Strategie di Apprendimento* / Learning Strategies Questionnaire): this questionnaire explores the student's metacognitive repertoire. This dimension develops through the use of concept mapping, spaced repetition, self-assessment, and strategy shifting when facing academic difficulties. In a textbook-free environment where resources are not pre-packaged but rather generated and curated via AI tools, the ability to select, organize, and monitor one's own strategies is particularly salient.
- SAS (School Anxiety Scale): this scale measures academic anxiety across three distinct dimensions: performance (exams and oral presentations), social (peer judgment and public speaking), and somatic (physical symptoms related to stress). The inclusion of the SAS is dictated by the composition of the sample, which includes students with SEN, learning disabilities, and individuals at risk of social withdrawal, for whom emotional well-being is a fundamental prerequisite for learning.

The questionnaires were administered to the students, and the resulting data underwent a triangulation process. This approach aimed to construct a multidimensional profile of the student, combining motivation (AMOS), strategic cognition (QSA), and the affective-emotional dimension (SAS) into a single cohesive framework.

**Figure 1**

*Psychometric Questionnaires Scores*




By examining the data analyzed from this initial research sample, several key insights can be observed.

The mean AMOS score, which ranges from medium to high, indicates that students demonstrate a strong willingness and predisposition to challenge themselves. Furthermore, it shows that they successfully achieve long-term memory retention of core concepts across most of the subjects studied.

The QSA data highlight that subjects where pure conceptual knowledge (acquired through traditional lecturing) intersected with teachers' efforts to anchor this knowledge to a more practical dimension yielded the highest performance scores in the digital assessments. A prime example of this can be seen in Philosophy and Computer Science, which approach this integration through completely different yet equally effective methodologies. Although our research is still in its preliminary stages, these findings demonstrate how "practical" or hands-on strategies significantly reinforce the consolidation of knowledge acquisition.

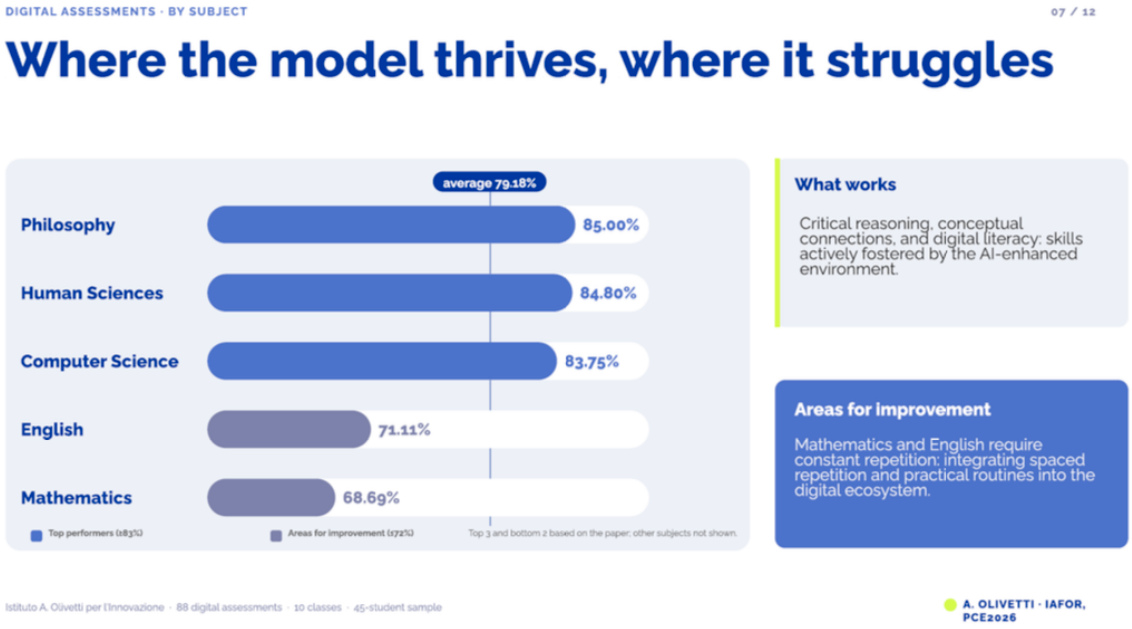
Conversely, the QSA questionnaire data—specifically the section concerning the time students dedicate to reviewing before a test—also reveal the most significant critical issues. These areas must be addressed to refine and enhance the educational environment. Indeed, the subjects that yielded the lowest scores in the digital assessments are precisely those requiring continuous, repetitive practice and exercise, such as Mathematics.

The scores derived from the SAS questionnaire proved to be the most successful, especially when aligned with one of the central, value-driven objectives of the Institute: combatting school dropout and social withdrawal. These metrics provide highly encouraging insights into the emotions experienced by students upon entering the school, revealing that students attend willingly and exhibit a very low rate of anxiety induced by the school environment itself.

Parallel to these psychometric questionnaires, a systematic assessment of conceptual and factual knowledge was conducted using 86 subject-specific quizzes termed "digital assessments." These tests were administered via the digital platform and involved the entire sample of 45 students distributed across 10 classes (representing the five-year high school cycle across two curricular tracks: LES and LSSA).

**Figure 2**

*End-of-Unit Quizzes Results*



The overall mean score stands at 79.18%—a result that, within the context of a completely textbook-free environment, can be considered remarkably positive. Over 55% of the quizzes (49 out of 86) exceed the 80% threshold, and 7 assessments fall within the excellence range (95–100%).The highest-performing subjects—Philosophy (85.00%), Human Sciences (84.80%), and Computer Science (83.75%)—share a common characteristic: they demand critical reasoning, conceptual connections, or digital literacy. These are precisely the skills that the AI-enhanced environment explicitly aims to foster. At the opposite end of the spectrum, Mathematics (68.69%) and English (71.11%) represent the primary areas for improvement, suggesting that disciplines with a strong procedural or linguistic component may require complementary pedagogical strategies within the digital ecosystem. Regarding the curricular tracks, the LES records a mean score of 80.38% compared to 76.79% for the LSSA ($\Delta = 3.59$ pp). This gap is more pronounced during the initial years and tends to narrow during the final three years, where the LSSA catches up with and occasionally surpasses the LES (e.g., 3rd-year LSSA: 81.85% vs. 3rd-year LES: 80.53%). The working hypothesis is that the curricular profile of the LES—which is more heavily oriented toward discursive and argumentative disciplines—adapts more readily to a quiz-based format. Conversely, the LSSA exhibits greater variability, showing peaks of excellence in STEM disciplines (e.g., 5th-year LSSA Computer Science: 97.50%) alongside more pronounced challenges in other areas.Through a comparative analysis of all the data collected and evaluated above, it is possible to map out a virtuous circle: positive quiz results generate higher motivation among students, which fosters greater commitment to studying, which in turn leads to enhanced academic performance.

## The Integration of Artificial Intelligence in Classroom Practice

The inclusion of Artificial Intelligence (AI) tools within the classroom opens new horizons for pedagogical structuring and instructional design. While the specific modalities of utilizing AI vary across disciplines and instructors, a shared educational and operational framework persists: AI tools are invariably deployed to organize previously acquired ideas and concepts, never serving as a substitute for the fundamental phases of independent study and knowledge acquisition.

Grounded in this approach, educators at the Olivetti Institute experimented with classroom AI integration during this inaugural academic year. Three illustrative case studies from Natural Sciences, Italian Language and Literature, and Human Sciences are presented below. These examples aim to provide empirical insights into the efficacy of artificial intelligence integration when framed as a complementary asset rather than an exhaustive solution to all pedagogical needs within a healthy school environment.

### Case Study 1: Environmental Requalification in Natural Sciences (5th-Year LSSA)

Artificial intelligence offers students the opportunity to operationalize their creativity through visual synthesis, bridging the gap between complex conceptual designs and their practical execution. This was demonstrated in a project conducted by the Natural Sciences instructor with fifth-year students in the Applied Sciences (LSSA) track.

Drawing from a real-world environmental news event, students designed a project focused on the environmental and social requalification of a polluted site. Each student assumed a distinct professional role within the class group, such as environmental engineer, air quality technician, or soil bioremediation specialist. The core objective was to formulate innovative

biotechnological solutions to restore the compromised environmental matrices and the site itself.

Once the structural proposal was finalized, students utilized AI tools to generate visual representations of the required equipment alongside a final rendering of the projected outcome. The project coordinator subsequently synthesized individual contributions into an innovative "Ecological Hub." Throughout the process, AI provided vital visual scaffolding across various project phases, enabling continuous monitoring. Guided by the final digital render, students ultimately constructed a physical scale model using exclusively recycled materials.

**Case Study 2: Textual Typologies and Literary Recasting in Italian, History, and Geography (1st and 2nd Year)**

Regarding the humanities curriculum, first-year students explored distinct textual typologies, focusing specifically on descriptive and expository texts.

Descriptive text exercises required students to use their own written descriptions to generate corresponding visual outputs—such as character identification cards, landscapes, or 3D models (via Meshy)—using generative AI platforms (Gemini, ChatGPT). Through this workflow, students engaged in foundational prompt engineering, concentrating heavily on lexical precision and spatial-temporal connectives.

Expository text exercises leveraged AI for presentation design. In this context, students used AI to deconstruct complex topics into smaller, digestible components, deferring content reformulation to a subsequent phase. This methodology exposed students to pre-structured informational hierarchies, allowing them to better grasp the logical connections between data—a core competency that required extensive practice throughout the year in both oral and written formats.

Furthermore, throughout the academic year, the instructor utilized AI to design practical workshops focused on alternative content creation, particularly to facilitate paraphrasing and deep comprehension of literary texts. Three workshops were implemented: two in the first-year class focused on the *Aeneid* and the *Odyssey*, and one in the second-year class centered on *The Betrothed* (*I Promessi Sposi*).

Grounded in the pedagogical objective of modernizing classical themes, each student group was assigned an excerpt from the literary work and tasked with recasting it into contemporary digital media formats tailored to the selected narrative episode. These formats included:

- WhatsApp group chats;
- True Crime podcasts;
- Double interviews;
- Reality show confessionals;
- Product reviews;
- "*Get Ready With Me*" (GRWM) video reels;
- Secret social media profiles and digital photo albums

### Case Study 3: Stereotype Deconstruction in Civic Education

Within the Civic Education curriculum, AI was prompted to generate a series of educational flashcards based on stereotyped concepts, utilizing the mechanics of the game Taboo. The prohibited keywords consisted of superficial prejudices, and students frequently struggled to articulate statements without relying on those specific biased terms. This experiential activity successfully demonstrated to the students the superficial cognitive structures upon which social stereotypes are built.

### Case Study 4: Theoretical Application in Human Sciences (3rd Year)

Finally, a notable methodology was adopted by the Human Sciences instructor with third-year students. At the conclusion of several lectures, the teacher prompted AI to generate specific case studies, subsequently requiring students to actively apply the sociological and psychological theories they were learning during class to these simulated real-world scenarios.

## Conclusion and Future Perspectives

Based on the preliminary results outlined during this inaugural year, the development of this longitudinal research will continue into the next academic cycle, with the primary objective of implementing data-driven improvements to better support our students' learning outcomes.

Future phases of the study will maintain the qualitative and quantitative triangulation between psychometric questionnaires and digital end-of-unit assessments. Concurrently, we aim to expand the statistical analysis by broadening the sample size, thereby moving closer to the threshold required for full statistical validity.

Targeted pedagogical interventions will be crucial moving forward, particularly regarding the strengthening of spaced repetition techniques and student distraction management. To address these areas, architectural workflows are currently being developed to integrate structured spaced repetition features directly into the institutional e-learning platform. Furthermore, expanding data collection remains essential; therefore, subsequent layers of learning analytics—such as platform access frequency, active study time, and individual repetition patterns—will be integrated to build predictive models of student performance.

Ultimately, the educational, instructional, and experimental trajectory of this ongoing research must remain firmly anchored within the foundational values that inspired the creation of our institution: an educational environment that unyieldingly places the student and their unique individual characteristics at the absolute center of the learning process.

## Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this manuscript, the authors used the generative AI tool Gemini (developed by Google) solely to assist in translating the original text from Italian into English and to refine the academic phrasing, grammar, and syntax. Following this process, the authors thoroughly reviewed, verified, and edited the resulting text. The authors maintain full responsibility for the originality, scientific accuracy, and overall integrity of the final work.

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