

*A MANUAL GUIDE FOR
BLENDED INTENSIVE PROGRAMME (BIP)*

SKILLS@UNI

DEVELOPING SOFT SKILLS THROUGH
EXPERIENTIAL LEARNING AT
UNIVERSITY

AN INTERNATIONAL PEDAGOGICAL EXPERIENCE

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***Skills@Uni: developing soft skills
through experiential learning at
university.
An international pedagogical
experience***

Coordinators

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Universidade da Madeira

Portugal, 2026

Technical Page

Title: Skills@Uni: Developing Soft Skills Through Experiential Learning at University. An international pedagogical experience.

Coordinators: Soraia Garcês, Giulia Conti, José Alberto Gonçalves, Ana Antunes, Hélder Lopes, and Ana Rodrigues.

Editor: Universidade da Madeira, Funchal, Portugal

Formatting and Text Review: Soraia Garcês and José Alberto Gonçalves

Cover: Soraia Garcês and Ana Rodrigues

ISBN: 978-989-9230-14-9

DOI: <https://doi.org/10.34640/univmadeira2026garcescontigoncalves>

May 2026

Disclaimer.

This publication is an output developed following a Blended Intensive Programme (BIP) funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them, nor do they represent, necessarily, the views of the book's coordinators or the publisher.

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Chapter 5

The MathIA Project and the Development of Students' Skills

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The MathIA project is a European project funded by the Erasmus+ program and is framed within the European priorities in the field of school education, with a particular focus on promoting STEM (Science, Technology, Engineering and Mathematics) areas and the STEAM approach ((Science, Technology, Engineering, Artes and Mathematics). Classified as a KA220-SCH - Cooperation Partnership in School Education, the project focuses centrally on the development of key student skills, particularly in mathematics, through the integration of artificial intelligence (AI) and experiential learning strategies.

The conceptual starting point of MathIA is aligned with the Skills@Uni framework, which emphasizes the development of soft skills in higher education through meaningful experiential learning. Although the project is mainly focused on school education, this framework allows bridges to be built between different levels of education and reinforces the relevance of competencies such as critical thinking, digital literacy, autonomy, and adaptability in rapidly evolving technological contexts. Specifically, the project was developed based on the need to improve students' mathematical skills, a common need in the countries involved in the project. This assumption is supported by PISA results (OECD, 2019; 2023) and by some studies in the field (e.g. Aguilar et al., 2015). Furthermore, there is a need to train and update

teachers in the application of new technologies and artificial intelligence in the teaching and learning process (Durak et al., 2024; Forero-Corba et al., 2024).

The MathIA project, considering that mathematics is a core subject in the students' academic path (Taylor, 2018), also aims to contribute to creating opportunities for students to further develop their skills and reduce differences between groups of students in their academic progress (OECD, 2025). In fact, mathematics is not only important for academic performance but also predicts many aspects of other achievements in an individual's life (Looi et al., 2016). In addition, technologies are emerging as important tools for intervention (Looi et al., 2016), and it is also important to address cultural stereotypes (Chestnut et al., 2018) and gender differences and self-efficacy theories (Todor, 2014). Moreover, artificial intelligence is emerging in the literature as a tool not only in mathematics education (e.g. Aulida et al., 2024) but across education more broadly (e.g. Forero-Corba et al., 2024). So, artificial Intelligence appears in this framework as both an object of curiosity and concern. Its increasing presence across multiple sectors of society, including education, raises ethical, pedagogical, and organizational questions, while also creating opportunities for personalized learning and support for students with diverse profiles and needs. The MathIA project builds on this context to explicitly question current educational practices and promote critical reflection on the use of AI by teachers and students.

The MathIA consortium brings together partners from three European countries, including universities and primary and secondary education institutions, enabling a multicultural and comparative approach that enriches activity design and outcome analysis. Concretely, the project involves nine partner institutions from Italy, Spain, and Portugal: four universities (University of Murcia, University of La Laguna, University of Madeira, and University of Pavia), three schools (Colegio Concertado Vicente Medina, Mayco School of English, and Istituto Comprensivo di Via Angelini), and the company COMENIUS IDI/AVENTURINNA iDi center (Center for Pedagogy and Educational

Psychology). To run the project, the leading institution is the Spanish University of Murcia.

A distinctive feature of the project is its central objective, namely the design of an artificial intelligence model aimed at improving adolescents' mathematical skills by considering individual profiles, difficulties, and talents. In parallel, the project foresees the creation of a resource bank designed to support teachers in programming education and the integration of digital technologies into teaching practices. Consequently, the expected results reflect this strategic orientation. Firstly, the project aims to develop personalized learning systems adapted to different contexts and educational needs, capable of considering students' individual characteristics. Secondly, improvements in mathematics performance among students from participating institutions are anticipated. Finally, MathIA seeks to contribute to improved school coexistence by promoting equality, diversity, and innovation in educational planning and classroom practices. To achieve these results the main project activities are organized around three core strands: teacher training courses, development of the resource bank, and the design of the artificial intelligence model. At present, teacher training courses are already implemented, while the other components are under development (the project spans 36 months, from October 2023 to October 2026).

As described, teacher training is a central pillar of the MathIA project. Three online training courses, each with a total workload of 15 hours, are offered, targeting different profiles. The first course, Digitization and Artificial Intelligence, is aimed at school teachers and university professors and includes modules on the introduction to digitization, AI fundamentals, practical applications in education, ethical and legal challenges, project development, and assessment. The second course, Digitalization and Artificial Intelligence, is directed at school teachers and focuses on the integration of AI into mathematics education, the creation of educational videos, the use of podcasts for self-paced learning, and an introduction to neural network programming.

The third course, Artificial Intelligence and the Teaching and Learning of Mathematics, targets university professors and addresses AI as a paradigm shift in education, exploring strategies for integrating AI into mathematics teaching and learning, as well as classroom planning and management supported by AI. Course evaluation is conducted through online questionnaires administered at the end of each course and each module. These instruments include items related to content relevance, clarity, professional applicability, adequacy of duration and online format, overall satisfaction, and willingness to continue training. They also include multiple-choice questions focusing on knowledge acquisition.

In addition to the training component, a research study (Antunes et al., 2026), associated with an ongoing master's thesis, was conducted. The data collected through questionnaires administered between November 2024 and January 2025 showed relevant trends. Most university students and school teachers reported having already used AI in their academic or professional activities and recognized clear advantages of AI for teaching and learning. However, across all three groups, most participants indicated they had never received formal training in AI applied to education, while clearly expressing the need for such training. Participants also reported perceiving both advantages and disadvantages in the use of AI and demonstrated limited awareness of existing national and international legislation regulating AI in education. Notably, many respondents indicated that teachers rarely explicitly encouraged students to use AI, suggesting a gap between personal use of such tools and their deliberate, pedagogically planned integration in classroom contexts.

In conclusion, the MathIA project represents a structured and innovative initiative in the field of mathematics education, combining teacher training, resource development, and AI. By integrating attention to diversity, critical use of artificial intelligence, and the development of key skills, the project contributes to an in-depth

reflection on the challenges and opportunities related to AI integration in education, with potential impact on both pedagogical practices and future educational policies.

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