

MASTED

MAster in integrated STEAM EDucation

EXECUTIVE SUMMARY



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*Total reading time: 15 minutes

THE NEED

- Today, the social, economic, labour and environmental problems faced by human beings have not only achieved enormous complexity, but also progress with unprecedented speed and variability.
- The tools that once made it possible to mitigate or solve problems have become partially obsolete, prompting the search for creative and innovative alternatives more dynamic and flexible.
- The ['Future of Jobs Report 2020'](#) published by the World Economic Forum estimates that by 2025 more than 50% of workers will have to adapt their skills to market needs to remain competitive. In this same forum, it was expressed that creativity, collaboration, critical thinking, active listening and work in multidisciplinary teams will be in high demand and that students have to prepare themselves in skills that cannot be replaced by machines.
- The difference, between the skills in demand and those already possessed by the current workforce, brings to the fore the need for change in future learning goals. Students require a broader set of skills and a different approach to face their university careers and the competitive world of work.

- According to the World Economic Forum , the transversal skills most in demand by companies in the next five years are :
 - ❖ Analytical thinking and innovation as a way of applying precise methodologies in addressing various work problems.
 - ❖ Active learning and learning strategies to be directly involved in the teaching process.
 - ❖ Ability to solve complex problems by working in phases: definition and analysis of the problem; understanding the needs of stakeholders; presentation of possible solutions and choice of the best for each problem.
 - ❖ Critical thinking and analytical skills such as the ability to develop independent and reflective thinking, but above all, to question personal ideas, reasoning and thoughts in order to be as objective as possible.
 - ❖ Creativity, originality and spirit of initiative as a synonym of open-mindedness and capacity for innovation.
 - ❖ Leadership and social influence, not as the ability to give orders, but to coordinate activities, define objectives, priorities, tasks, allowing the team to work independently, freely and autonomously in an environment of absolute trust, for which empathy is required.
 - ❖ Use of technologies, monitoring and control.
 - ❖ Technological design and programming as a competence reserved for technology professionals.
 - ❖ Resilience, stress management and flexibility as essential skills to manage the continuous feeling of uncertainty and challenge generated by the complexity and acceleration of today's world.
 - ❖ Reasoning, problem solving and ideation not only to solve them, but to being able to overcome obstacles in the shortest possible time. It's about being effective.

In response to these needs, MASTED arises. It has been submitted to the 2024 call for the ERASMUS EMJM unit grant belonging to the Erasmus+ Program.

MASTED is joint master's degree programme of 90 ECTS offered to bachelors whatever be their subject area of knowledge, which is committed to change educational systems by means of the qualification of education professionals, capable to train citizens through integrated approaches, for facing and solving global challenges with holistic and innovative perspectives.

MASTED

- MASTED (MAster in integrated STEAM Education) has been designed by 5 degree-awarding HEIs from Spain (**Universidad de Burgos**, acting as coordinating institution and **Universidad de Jaén**), Portugal (**Instituto Politécnico de Leiria** and **Instituto Politécnico do Cávado e do Ave**) and Brazil (**Universidade Federal da Bahia**) and a network of associated partners of 18 entities: 7 HEIs, 4 research centres, 2 SMEs, 2 language centres, 2 policy-making organizations, 1 school.
- **A maximum of 20 international students who stand out for their academic and professional excellence will be involved per edition.**
- It aims are:
 - ❖ Develop a new, innovative, high-level, integrated and transnational STEAM master programme, empowering practitioners to introduce this approach in all levels of formal and informal education, starting from kindergarten.
 - ❖ Help science education to focus on learning competences through STEAM, by linking science with other subjects and disciplines improving the citizen capabilities for finding innovative and integral solutions to our societal problems.

- MASTED provides specific competences and learning outcomes in different educational work fields with a double strand:
 - ❖ Professional: it is aimed at the educational profession (school and extracurricular, formal and non-formal).
 - ❖ Research and Doctorate: it gives access to the field of educational research and the Doctorate.
- **Some examples of the audience that MASTED graduates will address are:**
 - ❖ Graduates of degrees related to education (early childhood education, primary, secondary, special).
 - ❖ Teachers/education active practitioners in the different levels of the formal education system (early childhood education, primary, secondary, special, vet).
 - ❖ Related public sector staff at Ministry level.
 - ❖ Researchers and science populariser/communicators.
 - ❖ Museums staff.
 - ❖ Project managers.
 - ❖ Fab Labs staff.
- The Consortium has adopted a threefold vision to develop the programme:
 1. Pedagogical. Innovative methodologies necessary to support this type of learning and a different approach to integrated STEAM education.
 2. Technical. Positive changes in attitudes towards STEAM education, enabling students to use advanced technologies for learning or supporting teachers with real-time analytics.
 3. Business. Enabling sustainable collaboration networks between the industry; facilitate students to become entrepreneurs with a focus on solving projects.

- MASTED has been designed to take advantage of the knowledge and experience of each partner and associated partner for the benefit of the program.
 - ❖ It includes two compulsory mobility periods with a workload of at least one academic semester; one optional mobility for developing the final project and two compulsory journeys, the summer school and the graduation ceremony.
 - ❖ The Summer School will be organised to bring together MASTED student groups from the different universities to build a sense of community among them; to deepen in issues related to social justice, equity, and inclusion in STEAM education and to be in contact with the most innovative practices in STEAM education at the European level.
 - ❖ It includes two compulsory curricular internships periods in the Master's degree study plan. The aim of the internship is that students apply and complement their academic training, favouring the acquisition of skills that prepare them for the exercise of professional activities, fostering their employability and entrepreneurial capacity.
 - ❖ It includes a mandatory Final Master Project in the third semester. With the supervision of a tutor and, if desired, co-tutors, all students enrolled in the Degree Programme will develop a Final Master Project in which they will demonstrate the advanced knowledge acquired during the Master.

THE ASSOCIATED PARTNER FIGURE

- MASTED is a master's degree designed jointly to emphasize the strengths of each partner and minimize weaknesses with the incorporation of "external" agents that contribute to offering a coherent degree, which enables students to address a diverse future (doctorate, research, labour market) and oriented to the search (through training in STEAM tools and methods) of solutions/alternatives for the most pressing European problems at the moment. **These "external" agents are Associated Partners.**
- Such engagement and cooperation may include, but is not limited to the following contributions by or with non-educational actors, as the case may be:
 - ❖ guest lectures;
 - ❖ joint development of curriculum content (e.g. resources, lecture series, simulations, trainings and complementary courses);
 - ❖ contributing specific expertise for research projects in the degree programme;
 - ❖ field trips and excursions;
 - ❖ internship arrangements;
 - ❖ participation in external evaluation of the degree programme;
 - ❖ dissemination, communication and engagement of students;
 - ❖ sponsorship;
 - ❖ ...

➤ The role of a MASTED's Associated Partner described in the Consortium Agreement is:

- ❖ “[...] The Consortium can have associated partners with a limited role in the implementation of the degree programme in the form, but not limited to, knowledge and skills transfer, the provision of complementary courses or backing possibilities for secondment or placement.
- ❖ For contractual management issues, associated partners are not considered as part of the Consortium since they have a more limited role in the implementation of the Degree Programme.
- ❖ Arrangements between the Consortium and associated partners concerning the Degree Programme shall be regulated separately after signing the Grant Agreement and must be in conformity with the requirements of this Agreement. The Coordinating Institution shall sign these bilateral agreements on behalf of all Consortium with the associated partners.
- ❖ Associated partners shall be approved by the Consortium.
- ❖ Associated partners shall appoint a member partner coordinator to organize and coordinate the activities and the organisation of MASTED Programme in her/his institution, and to act as contact point with the MASTED Coordinator and the rest of the Partners.
- ❖ After signing the Grant Agreement, associated partners may participate in the Steering Committee, if they wish, without voting rights. Otherwise, they must be informed by the Coordinating Institutions of any decision made, and they must receive the minutes of the meetings. [...]”