



## International Funding Programmes for Scientific Research and Science Education

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### Abstract

*The European Commission, through different funding Programmes provides opportunities to enhance international cooperation in Science education, training, research and innovation. The Europe 2020 strategy provides the background to the current European funding Programmes.*

*The main two funding Programmes offering lecturers and researchers opportunities to finance their scientific research, the implementation of innovative educational strategies as well as opportunities for career development are the Erasmus+ and the Horizon 2020 Programme.*

**Keywords:** *International Cooperation, Science Education and Research, International Projects, Erasmus+, Horizon 2020;*

### The Political Framework

Europe 2020 is the growth strategy of the European Union that aims at creating the conditions for a smarter, sustainable and inclusive growth. Five key [targets](#) have been set for the European Union to be achieved by the end of the decade. These are:

1. Employment (75% of the 20-64 year-olds to be employed).
2. Research and development (3% of the GDP to be invested in Research & Development).
3. Climate change and energy sustainability (greenhouse gas emissions 20% - or even 30%, if the conditions are right - lower than 1990); 20% of energy from renewables; 20% increase in energy efficiency
4. Education (reducing the rates of early school leaving below 10%. At least 40% of 30-34-year-olds completing third level education)
5. Fighting poverty and social exclusion (at least 20 million fewer people in or at risk of poverty and social exclusion).

The Europe 2020 strategy is structured in seven main priorities and the initiatives to be implemented to achieve the planned benchmarks: innovation, the digital economy, employment, youth, industrial policy, poverty, and resource efficiency.

More information on Europe 2020 can be found at: [https://ec.europa.eu/info/strategy/european-semester/framework/europe-2020-strategy\\_en](https://ec.europa.eu/info/strategy/european-semester/framework/europe-2020-strategy_en)

### Erasmus+ Programme

Erasmus+ is the European programme for education, training, youth and sport. The aim of the Erasmus+ Programme is to contribute to the achievement of the objectives of the Europe 2020 Strategy, as well as of the objectives defined within the strategic framework for European Cooperation in Education and Training (ET 2020).

In order to achieve the mentioned objectives, the Erasmus+ Programme implements the following Actions:

#### KEY ACTION 1 – MOBILITY OF INDIVIDUALS

This Key Action supports:

- **Mobility of learners and staff** provides opportunities for students, trainees, young people and volunteers, as well as for professors, teachers, youth workers, staff of education institutions to undertake a learning and/or professional experience in another country;
- **Erasmus Mundus Joint Master Degrees** supports high-level integrated international study programmes delivered by consortia of higher education institutions worldwide;
- **Erasmus+ Master Degree Loans** offers loans guarantee schemes backed up by the Programme to be used by students to follow abroad for a full Master Degree.



## KEY ACTION 2 – COOPERATION FOR INNOVATION AND THE EXCHANGE OF GOOD PRACTICES

This Key Action supports:

- **Strategic Partnerships** aimed to promote innovation, exchange of experience and know-how between different types of organisations involved in education, training and youth.
- **Knowledge Alliances** between higher education institutions and enterprises aiming to foster innovation, entrepreneurship, creativity and multidisciplinary teaching and learning;
- **Sector Skills Alliances** involving VET institutions and companies in the analysis and anticipation of job market and specific economic sectors needs in order to delivery joint vocational training curricula, programmes and innovative training methodologies;
- **Capacity Building** projects promoting the cooperation between European and partner countries to support modernization and internationalization processes of Higher Education institutions and systems.

## KEY ACTION 3 – SUPPORT FOR POLICY REFORMS

- **Structured Dialogue** taking the form of meetings, conferences, consultations and events promoting the active participation of young people in democratic life in Europe.
- **Partnerships** to explore and develop proposals for systemic reforms in the field of education and training

## JEAN MONNET ACTIVITIES

- **Jean Monnet Activities** support excellence in teaching and research in the field of European Union studies worldwide.

## SPORT ACTIONS

- **Collaborative Partnerships**, aimed to combat doping at grassroots level, to fight against match-fixing, to contain violence and tackle racism and intolerance in sport.
- **Not-for-profit European sport events**, granting individual organizations in charge of the preparation, organization and follow-up to a given event.

The Overall Budget for the Erasmus+ Programme is 14.77 Billion Euro for the 2014-2020 period.

KA1 (around 63%) of the total budget

KA2 (around 28%) of the total budget

KA3 (around 4%) of the total budget

Further information on the Erasmus+ Programme is available on the European Commission's website at: [http://ec.europa.eu/programmes/erasmus-plus/index\\_en.htm](http://ec.europa.eu/programmes/erasmus-plus/index_en.htm)

## Horizon 2020 Programme

Horizon 2020 is the programme that finances research, development and innovation activities.

The main general objectives of the Horizon 2020 Programme are:

- Raising the level of excellence of Europe's scientific research through the support to researchers in order to explore and implement their innovative ideas
- Making Europe an attractive location for the world's best researchers.
- Making Europe a more attractive location to invest in research and innovation by promoting activities where businesses set the agenda
- Pooling investments in key industrial technologies and help innovative SMEs to grow into world-leading companies.
- Gathering together resources and knowledge across different fields, technologies and disciplines to address strategic challenges for the future wealth of European societies
- Supporting activities aiming to foster the passage from research to market with a new focus on innovation-related activities, such as piloting, demonstration, test-beds, and market uptake.

The Horizon 2020 Programme is organised in three Pillars.

## PILLAR 1 - EXCELLENT SCIENCE



Pillar 1 aims to reinforce the excellence of the EU's science base and to make the EU's research and innovation system more competitive on a global scale. The 1<sup>st</sup> Pillar also provides opportunities for individual and group researches according to science-driven nature. Pillar 1 is mainly 'bottom-up' and investigator-driven.

The Pillar is divided in four actions:

- **The European Research Council (ERC)** provides flexible funding opportunities to enable talented and creative researchers (individually and in teams) to pursue the most promising frontier research.
- **Future and Emerging Technologies (FET)** supports collaborative research for advanced and paradigm-changing innovation. It finances scientific collaboration across disciplines on radically new, high-risk ideas to accelerate development of the most promising emerging areas of science and technology.
- **Marie Skłodowska-Curie Actions (MSCA)** finances opportunities for researchers' training and career development through their cross-border and cross-sector mobility.
- **Research infrastructures** ensures access to world class research facilities

#### PILLAR 2 - INDUSTRIAL LEADERSHIP

Pillar 2 aims to make Europe a more attractive location to invest in research and innovation by promoting activities where businesses set the agenda.

The Pillar is divided in three areas:

- **Leadership in enabling and industrial technologies (LEIT)** provides support for research, development, demonstration, standardisation and certification of highly innovative products and services in three topic-based areas identified by the Programme:
  - Information and communications technology (ICT)
  - Nanotechnologies, advanced materials, biotechnology, advanced manufacturing
  - Space
- **Access to risk finance** offers financial support to overcome deficits in the availability of debt and equity finance for R&D and innovation-driven companies.
- **Innovation in SMEs (SME instrument)** provides a SME-tailored funding scheme to stimulate all forms of innovation in SMEs, targeting those with the potential to grow and internationalise across the single market and beyond.

#### PILLAR 3 - SOCIETAL CHALLENGES

Pillar 3 aims to address major concerns shared by modern societies through a challenge-based approach, bringing together resources and knowledge across different fields, technologies and disciplines.

Funding focus on topic-based challenges, already defined by the Horizon 2020's Workprogrammes, published every 2 years.

The 7 challenges are:

- Health, demographic change and wellbeing
- Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy
- Secure, clean and efficient energy
- Smart, green and integrated transport
- Climate action, environment, resource efficiency and raw materials
- Europe in a changing world - inclusive, innovative and reflective societies
- Secure societies - protecting freedom and security of Europe and its citizens

The total budget for the Horizon 2020 Programme for the 2014-2020 period is 70 billion euros:

- Excellent Science: 24.4 Billion Euro
- Industrial leadership: 17 Billion Euro
- Societal challenges: 29.7 Billion Euro

Further information on the Horizon 2020 Programme is available on the European Commission's website at: <http://ec.europa.eu/programmes/horizon2020/en>

### Examples of Successful European Projects in the field of Science Education



- **MATHE - Improve Math Skills in Higher Education**  
The project was funded by the European Commission in the framework of the Erasmus+ Programme, KA2 - Strategic Partnerships for Higher Education. The aim of the MathE project is to implement innovative assessment methods to help higher education Maths lecturers to identify knowledge gaps of their students so as to identify, on the basis of the assessment made, the best possible learning pathways aligned with the learners' needs.  
<https://mathe.pixel-online.org/>
- **FICTION - Functional ICT Instruction On the Net**  
The project was funded by the European Commission in the framework of the Erasmus+ Programme, KA2 - Strategic Partnerships for School Education. The aim of the project is to promote the use of digital technologies for the teaching and learning of scientific subjects at secondary school level.  
<https://fiction.pixel-online.org/>
- **ALCMAEON**  
The project was funded by the European Commission in the framework of the Erasmus+ Programme, KA2 - Strategic Partnership for Higher Education. The aim of the ALCMAEON project is to overcome the gap between clinical practice and historical perspective of medical humanities, through the representation of the historical scenarios and the integration of historical evidences in specific educational contents.  
<https://alcmadeon.pixel-online.org/>
- **SMILD – Students with Mathematics Learning Disabilities**  
The project was funded by the European Commission in the framework of the Erasmus+ Programme, KA2 - Strategic Partnership for School Education. The aim of the SMILD project is to provide secondary school maths teachers with the skills to facilitate the learning of mathematics by students with learning disabilities.  
<https://smild.pixel-online.org/>
- **DO WELL SCIENCE**  
The project was funded by the Erasmus+ Programme, KA2 - Strategic Partnership in the field of School Education. The project aims at increasing secondary students learning results in STEM subjects (maths, physics and natural sciences) through the development of a STEM teaching package addressed to both Teachers and students.  
<https://www.dowellscience.eu/project/>
- **ZOE - Zoonoses Online Education**  
The ZOE European project, funded by the European Commission in the framework of the Erasmus+ Programme, KA2 Strategic Partnership in the field of Higher Education aims to create teaching resources in the field of veterinary medicine focusing in particular on the identification, monitoring and control of malaria.  
<http://zoeproject.eu/>
- **E-LEARNING FROM NATURE**  
The E-Learning From Nature project funded by the European Commission in the framework of the Erasmus+ Programme, KA2 Strategic Partnership in the field of School Education aims to improve secondary school students' basic skills in scientific subjects.  
<http://enature.pixel-online.org/>
- **SOFTIS-PED - Softskills for Children's Health**  
The Softis-Ped project funded by the European Commission in the framework of the Erasmus+ Programme, KA2 Strategic Partnership in the field of Higher Education is addressed to medicine university lecturers in the pediatrics field. The project aims to provide them with relevant soft-skills as far as communication, transparency, organization, intercultural issues are concerned.  
<http://softis-ped.pixel-online.org/>