

Deliverable 9.1 - Definition of the research priority themes and evaluation criteria

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| Abstract | This document illustrates the methodology adopted and the activities carried out in order to achieve the expected result, that is the decision of the 7 research topics on which activities of WP9 will focus on as well as the related evaluation criteria. |
| Keywords | Research; Topics; Cooperation; S3; Strategies |

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1 Purpose

In this document the decision process carried out by the EDUC Alliance in order to identify the 7 priority research themes (5 funded with EDUC budget + 2 additional ones funded by the French Government) is illustrated, as well as the indicators to evaluate the main activities linked to research in Work Package 9.

2 Decision making meeting 11-12 February 2020 – Cagliari (Italy)

The meeting was very successful and was attended by all EDUC Partners with Vice Presidents for Research and Vice-Presidents for Internationalization or delegates plus the Project Managers of UP, UR1 (videoconference), UPN and UNICA.

The Agenda of the meeting (attached) shows the issues discussed during the session dedicated to WP9 and those discussed in the Steering Committee meeting which will be reported in detail in the related Minutes.

2.1 Decision making methodology

The decisions taken by the Steering Committee Members were driven by a series of information provided to them by the WP9 Leader (the University of Cagliari), as well as by the Vice Presidents for Research or delegates.

Specifically, information taken into consideration was:

- the EDUC Partners' research cooperation areas;
- the Smart Specialization Strategies (S3);
- the 5 Missions of Horizon Europe;
- the strategic research areas and research areas of excellence in each of the 6 EDUC Universities.

2.1.1 The EDUC Partners' research cooperation areas

In order to provide useful material for the decision-making process, the University of Cagliari (WP Leader) with the contribution of all the other partners, created a **database** of ongoing or previous cooperation between two or more EDUC Partners. Data collected were related to **two types of cooperation**:

- formal cooperation: research projects, joint papers/books, research agreements etc.
- informal cooperation

The data collection process was articulated into four main steps:

step 1 - data shared among Partners during the EDUC project drafting period were elaborated and included in the database;

step 2 – a search was carried out on Web of Science to identify all the publications jointly authored by two or more EDUC Partners;



step 3 – in order to include in the database as many cooperation as possible, an official request of information was sent to all professors/researchers of the University of Cagliari, Rennes 1 & Masaryk;

step 4 - once gathered and included in the database, data were grouped into **macro research areas**.

The result of the data analysis is shown in the graphic and table below:

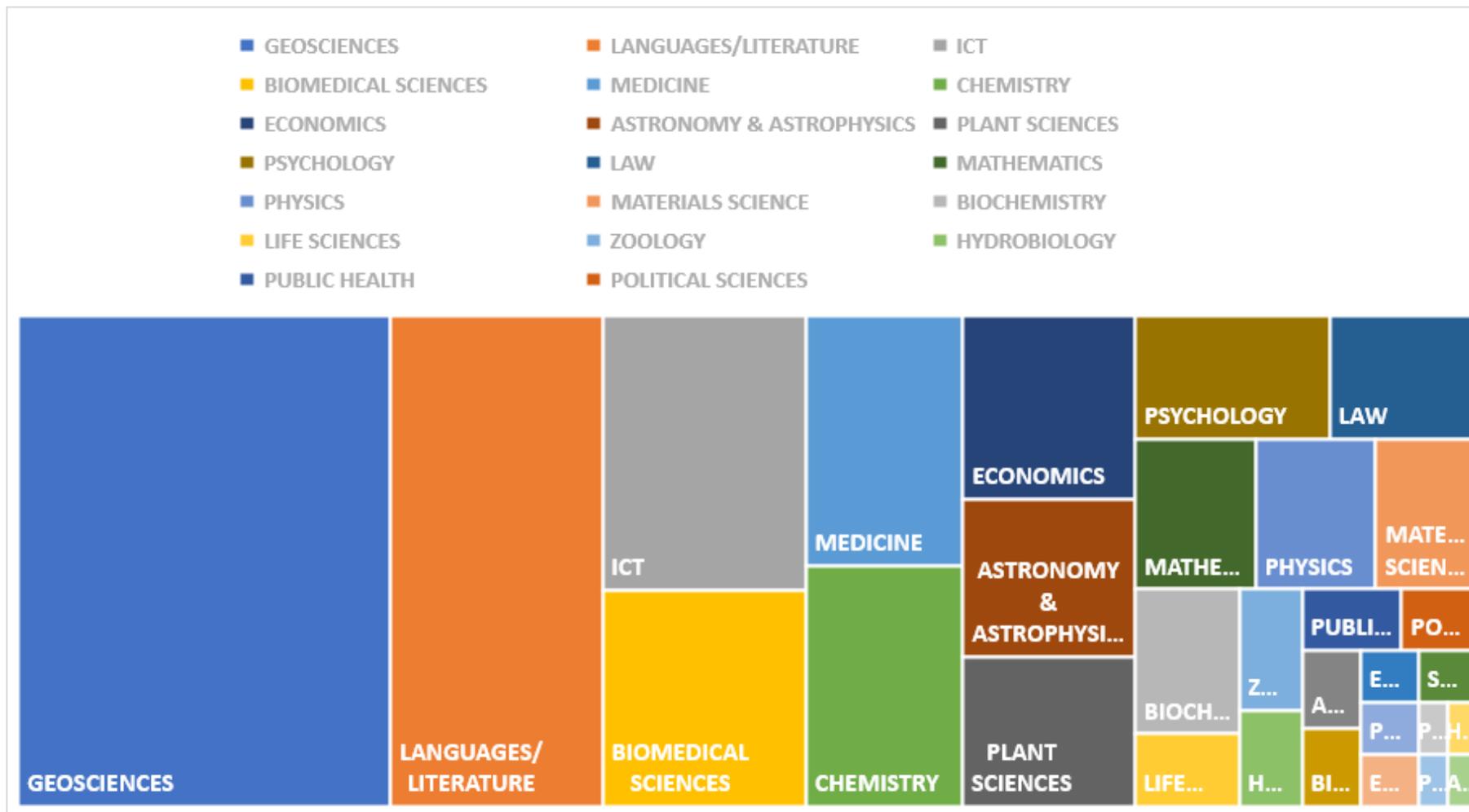


Figure 1. EDUC Partners' research areas of cooperation

Table 1. Number of EDUC Partners' cooperations in research macro areas

| MACRO AREAS | N. | % | MACRO AREAS | N. | % |
|--------------------------|-----|-------|--------------------------------|----|------|
| GEOSCIENCES | 121 | 25,5% | LIFE SCIENCES | 5 | 1,1% |
| LANGUAGES/LITERATURE | 69 | 14,6% | ZOOLOGY | 5 | 1,1% |
| ICT | 37 | 7,8% | HYDROBIOLOGY | 4 | 0,8% |
| BIOMEDICAL SCIENCES | 29 | 6,1% | PUBLIC HEALTH | 4 | 0,8% |
| MEDICINE | 26 | 5,5% | POLITICAL SCIENCES | 3 | 0,6% |
| CHEMISTRY | 25 | 5,3% | ARCHAEOLOGY | 3 | 0,6% |
| ECONOMICS | 21 | 4,4% | BIOLOGY | 3 | 0,6% |
| ASTRONOMY & ASTROPHYSICS | 18 | 3,8% | EDUCATION | 2 | 0,4% |
| PLANT SCIENCES | 17 | 3,6% | SOCIAL SCIENCES AND HUMANITIES | 2 | 0,4% |
| PSYCHOLOGY | 16 | 3,4% | PHILOSOPHY | 2 | 0,4% |
| LAW | 12 | 2,5% | ETHOLOGY | 2 | 0,4% |
| MATHEMATICS | 12 | 2,5% | PHSYCOLOGY | 1 | 0,2% |
| PHYSICS | 12 | 2,5% | HISTORY | 1 | 0,2% |
| MATERIALS SCIENCE | 10 | 2,1% | PSYCOLOGY | 1 | 0,2% |
| BIOCHEMISTRY | 10 | 2,1% | ANTHROPOLOGY | 1 | 0,2% |

Highlighted in yellow the 10 macro areas with the highest number of formal & informal cooperation.

2.1.2 The Smart Specialization Strategies (S3) of the EDUC regions

As written in the EDUC project proposal, the choice of the 5/7 research topics on which mainly focus the activities planned within WP9, should give priority, as far as possible, to the Smart Specialization Strategies of the involved regions. To this end, the WP Leader prepared a table to show the specialization areas identified by each EDUC region and to highlight the common ones.

Table 2 Smart Specialization Strategies of EDUC Regions

| n. of Regions | States of Berlin and Brandenburg (Potsdam) | Sardinia Region (UNICA) | Bretagne (Rennes) | Ile-De-France (Paris Nanterre) | Hungary (Pécs) | Czech Republic (Masaryk) |
|---------------|--|--|--|---|---|--|
| 6 | ICT, Media and Creative Industries | ICT | Technologies for the digital society | Digital creation / Complex systems and software engineering | ICT and information services | Software and hardware development |
| 3 | Transport, Mobility and Logistics | | | | Advanced technologies in the vehicle and other machine industries | |
| 6 | Energy Technology | Smart networks for efficient energy management | Observation, and energy and ecological engineering | Smart and carbon-free vehicles | Clean and renewable energies | Advanced production and engineering technologies |
| 3 | Optics and Photonics | | Advanced technologies for industrial applications (optics & photonics) | | | Precise instruments |
| 6 | Clusters Healthcare Industries | Biomedicine | Health and wellbeing | Medical devices | Healthy society and wellbeing | Pharmaceutics, medical care and diagnostics |
| 2 | | Aerospace | | | | Aircraft technology |

| | | | | | | |
|---|--|----------------------------------|---|--|---|--|
| 4 | | Tourism, culture and environment | Observation, and energy and ecological engineering / Social innovation for an open and creative society (a) Towards social and community innovation, b) E-education and e-learning, c) Heritage and sustainable tourism, d) Creative and cultural industries, e) Trends and developments in business models across industry and companies)/ Maritime activities - Blue Growth | Eco-building and environmental-oriented neighborhood | Sustainable environment / Inclusive and sustainable society | |
| 3 | | Agro-industry | Sustainable food supply chain | | Agricultural innovation / Healthy local food | |

As shown in the table, the strategic areas common to all the 6 EDUC Regions are three: **ICT, Energy and Health**; four Regions have **Environment** as a strategic area; other three strategic areas were common to 3 Regions each: **Transport/mobility; Advanced technologies and instruments; Agro-Industry**; finally, **Aerospace** was in the S3 of two regions.

It is noteworthy to underline that the above mentioned S3 were referred to the period 2016-2019 and Regions are now elaborating updated strategies.

2.1.3 The 5 Mission areas of Horizon Europe

The Vice-Rector for international affairs of the University of Cagliari (Prof. Alessandra Carucci - WP9 Responsible) read the contents defined by the EU Commission for each of the 5 mission areas of the Horizon Europe Programme:

1. Cancer
2. Adaptation to climate change including societal transformation
3. Healthy oceans, seas, coastal and inland waters
4. Climate-neutral and smart cities
5. Soil health and food

While reading what each mission area deals with, she underlined linkages with cooperation areas of EDUC Partners and with S3 of the EDUC regions.

2.1.4 The strategic research areas and research areas of excellence in each of the 6 EDUC Universities



Figure 2. EDUC Vice Presidents for Research, Vice Presidents for Internationalization, Steering Committee Members and Project Managers

After the presentation of the WP9 Responsible, each Partner Representative gave a brief speech on the macro areas considered as the strategic ones for its own institution.

Paris Nanterre – Presenter: Sonia Lehman-Frisch (Vice-President for International Affairs)

As shown in the figure n. 4 below, the University of Paris Nanterre has four main Interdisciplinary Strategic Research Fields and, specifically: **1. Heritage, Memory, Society; 2. Arts, Creation & society; 3. Justice, inequalities and differences; 4. Risks, Behavior, Vulnerability.**

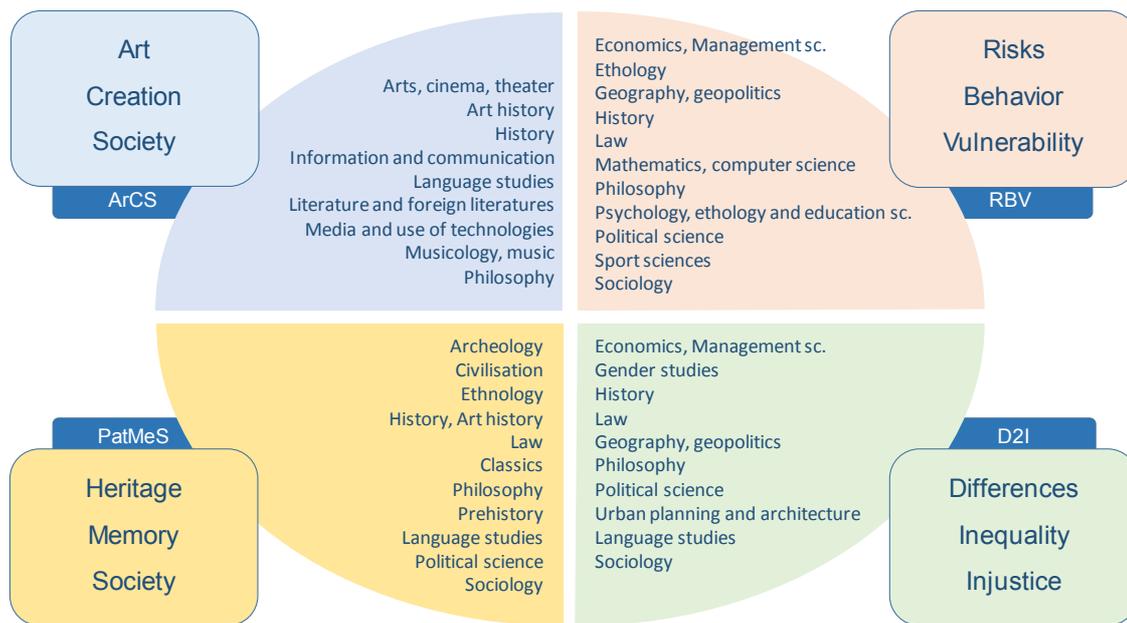


Figure 3. University of Paris Nanterre main Interdisciplinary Strategic Research Fields

In addition to the four areas above, Paris Nanterre identified other three Interdisciplinary Research Areas of interest and, specifically: Environment; Health and well-being & Europe.

University of Rennes 1 – Presenter: Sébastien Le Picard (VP in charge of European programmes)

The VP for European Programmes informed that the University of Rennes has identified five main research domains:

- **Mathematics/ICT**
- **Life Sciences/Health**
- **Physical Sciences**
- **Environment**
- **Law/Economics/Management and Philosophy**

University of Potsdam – Presenter: Professor Dr. Florian Schweigert (Vice President for International affairs)

Professor Schweigert illustrated the four main research focuses at the University of Potsdam:

- Cognitive Sciences
- Data-centric Sciences
- Earth and Environmental Systems
- Evolutionary System Biology

Masaryk University – Presenters: Šárka Pospíšilová (Vice Rector research) & Břetislav Dančák (Vice Rector internationalization)

The Vice Rectors of the Masaryk University underlined that the new strategic plan is being drafted but currently, the research areas of main interest are:

- Innovation for healthy societies
- Healthy and secure societies
- Artificial intelligence/Automatization/Smart Cities
- Medicine/Neurosciences/Psychology
- Relations between urban and rural areas

Pécs University – Presenter: Jòzsef Betlehem (Vice Rector for Strategy and Connections)

The Vice Rector underlined that Pécs is one of the leading research universities in Hungary and its basic and applied research is conducted in the following main disciplines:

- Organic and inorganic sciences
- Social sciences
- Engineering sciences
- Humanities

In the EU framework Pécs carries out research in:

- Environmental laser technology
- Biotechnology
- Pharmaceutics

University of Cagliari – Presenter: Prof. Micaela Morelli (VP Research)

Prof. Morelli remarked the multidisciplinary nature of the University of Cagliari and in order to share info on the most active research fields, she showed a few slides with the number of publications in the different areas in the last 7 years (2012 – 2019):

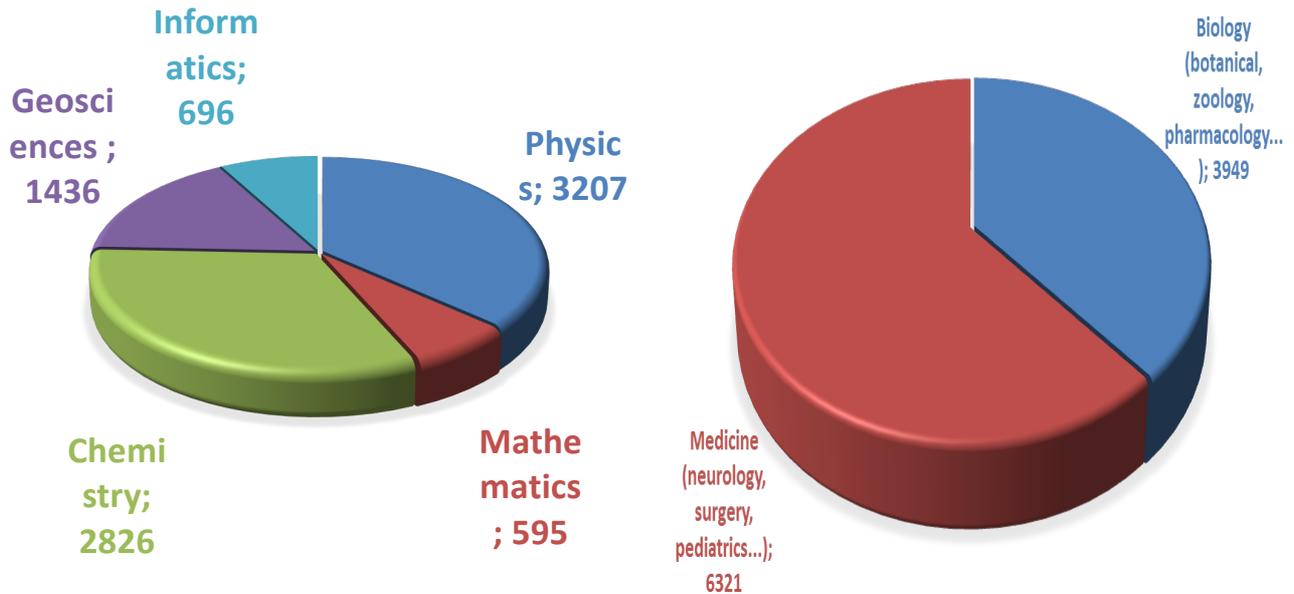


Figure 4. University of Cagliari: left) n. of publications in Physics, Mathematics, Chemistry & Geosciences; right) n. of publications in Biology and Medicine, in the period 2012-2019

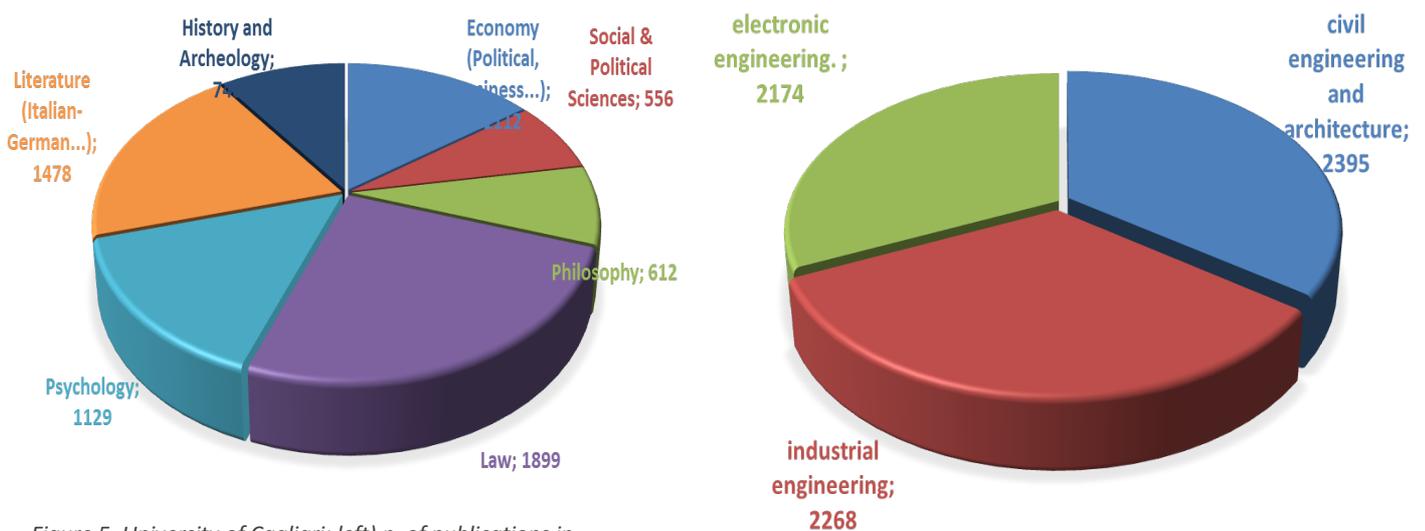


Figure 5. University of Cagliari: left) n. of publications in Economical Sciences, Social & Political Sciences, Law, Psychology and Archeology; right) n. of publications in Engineering, in the period 2012-2019

2.2 Steering Committee final decision on the 7 research topics



After the presentations made by each partner, the Steering Committee Members were invited by the Project Managers to write down on post-its the **four research areas** considered as the most important for EDUC strategic implementation taking into account all the information provided in the previous sessions of the meeting.

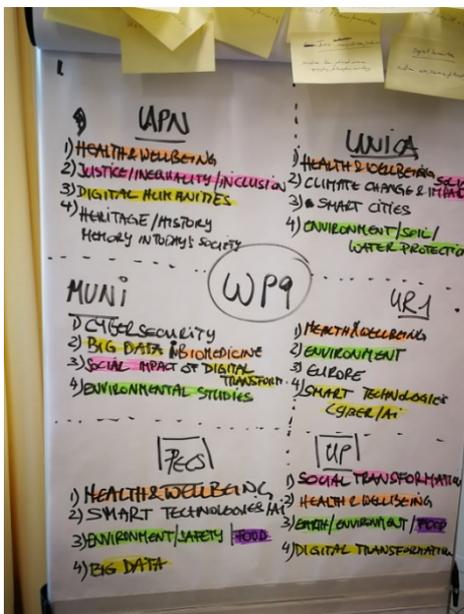
Areas indicated on post-its were then transcribed into a flipchart under the names of the respective institution in order to

make them visible for everyone.

Figure 6. EDUC Steering Committee Members proposing 4 research topics

Afterwards, the topics indicated by the universities were grouped

under six main Macro Areas and further sub topics were indicated under each one:



1. Health & Wellbeing
2. Environment
3. Digital transformation
4. Social Transformation
5. Europe
6. Smart cities and mobility

Figure 7. The 4 main research topics per each EDUC University

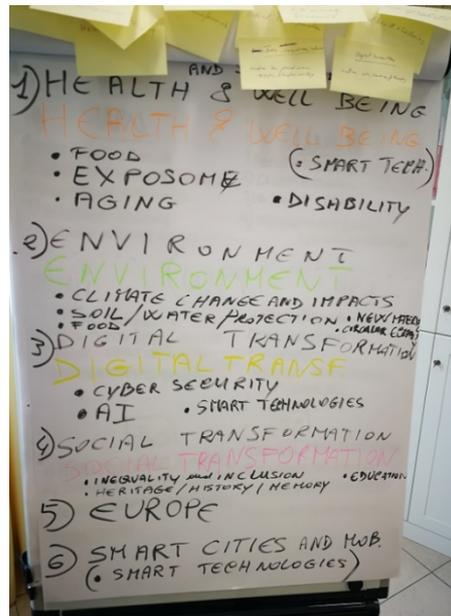


Figure 8. Topics grouped under 6 Macro Areas

Finally, the Steering Committee Members chose unanimously 7 topics from the six macro Areas:

1. Healthy aging
2. Artificial Intelligence and Cyber Security
3. European Union Studies
4. Climate Change and its impacts
5. Justice, inequality and inclusion*
6. Mobility / smart cities*
7. Culture and heritage



Figure 9. The 7 EDUC topics identified by the Steering Committee Members

With regard to the topic n. 7, it is noteworthy to mention that the proposed topics were two: Circular Economy and Culture and Heritage. Steering Committee members had to vote, and Culture and Heritage was the topic with more votes. However, considering the relevance of Circular Economy, it was decided to find a way to include this topic too.

Taking into account that in the EDUC Project the topics to be identified within WP9 were only five and that activities related to the two additional ones will be funded with resources of the French Government, the Steering Committee Members decided that the two additional topics are:

5. Justice, inequality and inclusion (to be coordinated by UPN);
6. Mobility / smart cities (to be coordinated by Rennes 1).

2.3 Indicators to evaluate WP9 research related activities

Another relevant task of the Steering Committee Members was that of identifying additional indicators to evaluate the activities planned within WP9 - task 9.3 "Transform bilateral collaborations into collaborations open to all EDUC members". The indicators already reported in the project per each sub task are:

| Sub-task 9.3.1 | Sub-task 9.3.2 | Sub-task 9.3.3 |
|-----------------|--------------------|---|
| 5 topics chosen | 5 two day seminars | Min. 72 students (bachelors + master students) complete |

| | | |
|-------------------------------------|----------------------------------|---|
| | | the 3 month research traineeship experience |
| 2 additional topics (FR GOV) chosen | min. 50 participants per seminar | |

The additional ones are the following:

- N. of joint PhDs (with the involvement of at least two EDUC Partners);
- N. of new jointly submitted publications (with the involvement of at least two EDUC Partners);
- N. of jointly submitted research projects (with the involvement of at least two EDUC Partners).

Taking into account that EDUC Partners already cooperate and have active joint PhD as well as joint publications, the next step will be that of identifying the baseline and the expected targets.

These numbers will be discussed and decided within WP9 in the near future.

3 ADDENDUM

3.1 SC Meeting in Pécs, 10-12 March 2020: topics' refinement

On the 11 March, almost all the Steering Committee Members met in Pécs in order to share the progress of activities within each WP. The VP for International Affairs and the PM of the University of Cagliari could not travel to Pécs due to national restrictions linked to Covid19 and participated to the meeting through a Skype connection.

As anticipated during the SCM in Cagliari, Partners would have further reflected on the sub-topics/disciplines to be included under each topic in order to ensure maximum participation by their teachers / researchers in the implementation phase. Two of them deemed it necessary to slightly adjust the "titles" of three topics to be clearer on expectations thus providing shared paths for the organization of the seminars. Specifically, the changes are highlighted hereafter:

1. **Healthy aging** becomes **Lifelong Health and Wellbeing**
2. **Artificial Intelligence and Cyber Security** becomes **Cyber Security and Artificial Intelligence**
3. **European Union Studies**
4. **Climate Change and its impacts** becomes **Sustainable Changes: climate and resources**
5. **Justice, inequality and inclusion**
6. **Mobility / smart cities**
7. **Culture and heritage**

The Steering Committee Members agree on the above 7 topic titles.

About the organization of the research seminars it was proposed to have a leader and a co-leader from another institution.

3.2 WP9 Meeting (via Teams), 3 April 2020: indicators' and targets' refinement

During the WP9 video meeting which took place on April 3, the following indicators were agreed to monitor and evaluate the activities that will be implemented under task 9.3:

| Sub-task 9.3.1 | Sub-task 9.3.2 | Sub-task 9.3.3 |
|--|---|--|
| n. 5 topics chosen | n. 5 two day seminars + n. 2 two day seminars | n. min. 72 students (bachelors + master students) complete the 3 month research traineeship experience |
| n. 2 additional topics (FR GOV) chosen | n. min. 50 participants per seminar for the 5 EDUC ones | |

| | | |
|---|--|--|
| n. 5 agreements for PhDs with double/multiple/joint degree (with the involvement of at least two EDUC Partners); | n. min. 24 participants per seminar for each of the two additional ones | |
| n. 12 Master thesis/PhDs cooperation/co-supervision | | |
| n. 10 new jointly submitted publications (with the involvement of at least two EDUC Partners) | | |
| n. 10 of jointly submitted research projects (with the involvement of at least two EDUC Partners) | | |
| n. 1 framework agreement for joint PhDs signed among all EDUC partners | | |