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## EELISA Credential: The Recognition Of Commitment And Impact In The Addressing Of Societal Challenges In The EELISA Alliance

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**EELISA Credential: THE RECOGNITION OF COMMITMENT AND  
IMPACT IN THE ADDRESSING OF SOCIETAL CHALLENGES IN THE  
EELISA ALLIANCE**

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## **ABSTRACT**

*EELISA Credential is a unique recognition process provided to EELISA students, professional and alumni who are part of the mission-driven EELISA communities and reflects the commitment and impact level achieved in the addressing of a societal challenge.*

*The EELISA Credential is an individual, progressive environment on which students collect badges. These badges are acquired after verifying the achievement of an educational outcome level after participating in community's educational activities. A badge represents the unit of learning acquisition and impact that corresponds to an educational outcome. It is reflected in the EELISA Credential which itself refers to an impact level and a Sustainable Development Goal (SDG).*

*The impact level represents the badge measurement scale. In the EELISA Credential, there are 5 levels of impact (discovery, knowledge, engagement, action, transformation) that correspond to learning objectives relative to SDGs.*

*The education activities proposed by EELISA Communities are defined around a societal challenge defined by a problem owner (faculty, students, local communities). Each activity is centered in 1 or 2 SDGs, and recognizes a maximum of 4 badges.*

*Through the involvement in the activities of EELISA Communities, students enrich their EELISA Credential in areas addressing Sustainable Developments Goals (SDGs), progressively improving their capacity for understanding, action and transformation.*

*In this practice paper, we will present the requirements for activities to be part of the EELISA Credential, representative and successful activities, the Quality Assurance system, the lessons learnt in the process of implementing the credential and how EELISA Credential will evolve in the future.*

## **1 EELISA ALLIANCE AND THE EELISA ROADMAP TO THE EUROPEAN ENGINEER**

The European Engineering Learning Innovation and Science Alliance, EELISA, with its acronym inspired by Elisa Zamfirescu —the most international of Europe's pioneering women engineers [1]—, brings together nine universities from seven different countries, with 180,000 students, 16,000 academics and researchers, and 11,000 other staff, with the aim of promoting a model European engineer and architect combining technical competence and societal impact [2][3].

EELISA aims to transform European higher education while strengthening links between engineering and society by re-inventing the “European engineer”, democratizing engineering education, evolving interdisciplinary engineering learning, encouraging

knowledge, skills and technology transfer, fostering inclusiveness and diversity and making a real impact on society following the 2030 Agenda for Sustainable Development and the SDGs.

EELISA Alliance partners are Budapesti Műszaki és Gazdaságtudományi Egyetem (Hungary), École Nationale des Ponts et Chaussées (France), Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany), İstanbul Teknik Üniversitesi (Turkey), Scuola Normale Superiore (Italy), Scuola Superiore Sant'Anna (Italy), Universidad Politécnica de Madrid (Spain), Universitatea Politehnica din București (Romania) and Université Paris Sciences et Lettres (France).

The four pillars of the European Engineers as envisioned by EELISA are [4]: 1) High level of scientific, theoretical and digital skills; 2) Addressing Sustainability; 3) Interculturalism: an engineer embracing the European project; and 4) Business and communication skills and critical thinking: practical and applied knowledge.

As academic tools for recognition, the institutions of the EELISA alliance have agreed on the following [5]:

- EELISA credential: the “academic materialization” of innovative and transformative learning experiences produced by EELISA Communities and recognizes the student's engagement in activities framed within the Sustainable Development Goals (SDGs).
- EELISA Supplement: an EELISA mobility "certificate" designed to encourage and reward academic mobility (physical, digital or hybrid) within the alliance. It is attached to a bachelor or master/engineering degree and is awarded to students having completed at least 6 ECTS in mobility per academic year either accumulated or carried out in one go with internships, studying abroad, participating in activities linked to a community, or through courses included in the EELISA joint catalogue.
- EELISA Degree: initially a label for the joint degrees offered within the alliance, realising shared visions for the European Engineer profile, learning outcomes and methodological elements (scientific level, approach focused on learning outcomes, creation of a multicultural, multidisciplinary student experience anchored in societal challenges). In the long-term, the EELISA Degree will be a degree awarded with European recognition for a study program jointly organized by EELISA partners.

## **2 EELISA CREDENTIAL**

### **2.1 Introduction and background**

The EELISA alliance has established Communities as a major asset for engaging internal and external stakeholders and transforming member institutions with new forms of collaboration. EELISA Communities allow students, staff, faculties and external stakeholders to work together on multidisciplinary issues and put societal challenges at the center of cooperative activities between alliance members [6].

EELISA Communities produce activities (“learning experiences”) that are innovative and transformative learning experiences for the participants, primarily the students. The EELISA Credential is the “academic materialization” of these experiences – it is a passport, certified,

fraud-free and IT-based, in which the student collects the evidences (“badges”) of participation in the activities of the EELISA Communities.

The general principles of the EELISA Credential are as follows:

- It is built on the whole of an educational pathway in a progressive way
- It is built from the activities belonging to one or more Communities
- It is individual (whereas a Community has a collective scope).
- It is awarded to students and possible alumni, not faculties
- It materializes/recognizes ability to contribute to solving societal challenges addressed by Communities and as defined by the UN Sustainable Development Goals (SDGs) [7]

The EELISA Credential is not a diploma/degree or an educational pathway in the sense that it does not address a profession or a disciplinary field. It is a recognition of learning outcomes acquired in performing activities related to specific SDGs [8].

## **2.2 Requirements for EELISA Credential**

The EELISA Credential opens for the student upon participation in his/her first activity of an EELISA Community. The EELISA Credential expresses the achievement of educational outcomes by participating in activities of EELISA Communities [6].

One activity is formed by a set of badges. A badge corresponds to an impact level in one of the SDGs educational outcomes.

For each SDG, the activity designer can define 5 possible badges, each corresponding to a level of impact (discovery - knowledge - commitment - action - impact), that leads to a total number of 85 badges associated to the 17 SDGs (section 2.3).

Each activity is associated to at least one SDG, thus resulting in the number of badges associated to each activity. The SDGs, the learning outcomes and the number of badges associated to an activity are given in the Activity description. Each activity is centered in 1 or 2 SDGs and recognizes a maximum of 4 badges.

Each activity, according to its nature, its ambition, its theme can allow each participant to validate one or more badges. It is up to the activity designer to select which badge(s) a participant is eligible for. The activity designer proposes the badge(s) to be awarded to the community coordinator/leader, as well as the proposed assessment method.

Activities of the EELISA Credential have to comply with the following requirements:

- 1) Belonging to an EELISA Community and being validated by the Community coordinator.
- 2) International: it is offered to all EELISA students with no significant barriers, if carried out locally, an effective and international exchange of data or knowledge is demonstrated, student teams shall be formed by students of more than one EELISA university, co-tutorship of Bachelor and Master Thesis from two EELISA universities.
- 3) Society-oriented: must be outward-looking/practical (thus differentiating itself from a regular course), this may be through its subject, participation of stakeholders...

### 2.3 Impact levels

One of the most innovative and transformative aspects of the EELISA Credential is the introduction of learning outcomes linked to a measurement of the societal impact that is product. With this impact measure, EELISA alliance intends to motivate and recognize the commitment and impact produced by the actions of the students in their pathway to resolve societal challenges.

Each badge corresponds to both an educational outcome and to a level of impact. 5 impact levels have been defined in the SDGs educational outcomes according to [7] (Fig. 1):

- Level 1 = DISCOVERY: activities aiming at networking, generating community and generating awareness (simple participation in a conference as a listener)
- Level 2 = KNOWLEDGE: knowledge and thinking skills necessary to better understand the SDG and the challenges in achieving it (5 cognitive educational outcomes)
- Level 3 = COMMITMENT: social skills that enable learners to collaborate, negotiate and communicate to promote the SDGs as well as self-reflection skills, values, attitudes and motivations that enable learners to develop themselves (5 socio-emotional educational outcomes)
- Level 4 = ACTION: activities aiming at developing behavioral competences to produce solutions for fulfilling the mission of the community (5 behavioural educational outcomes)
- Level 5 = TRANSFORMATION: impactful activities resulting in change, with demonstrable and quantifiable KPIs.

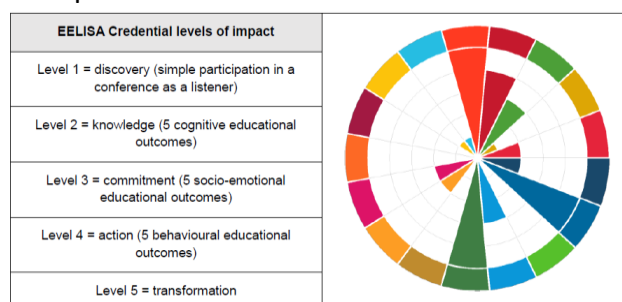


Fig. 1. Levels of impact of the EELISA Credential and corresponding 'SDG radar'

### 2.4 Guidelines for designers of EELISA Credential activities

As a framework for thinking about activity designers, we can recommend the assessment methods in Table 1 for the EELISA Credential's SDGs educational outcomes levels.

Table 1. Levels of educational outcomes for EELISA credential

Level	EELISA Credential outcome	Key words for educational outcomes	Example of an associated learning experience	Examples of assessment methods	Collective component required
Level 1	Discovery / engagement	Exposure, superficial and beginners' knowledge	Conference / Roundtable	Attend a conference	None
Level 2	Knowledge	Understand, Evaluate, Know	Cycle of conferences / MOOC	MCQ, Essay, Reflective practice	Low
Level 3	Commitment	Connect with, Reflect, Contextualize, Feel	Lectures with applied tutorials	MCQ, Reflective practice, Problem solving, Essay	Moderate

		responsible			
Level 4	Action	Plan, Implement, Influence, Speak, Organize, Promote, Create	Group work with production of deliverables	MCQ, Essay, Problem solving, Practical work	Strong
Level 5	Transformation	Implement, Probe, Deployment, Build	Impactful project with demonstrable KPIs (funds raised, populations reached, stakeholder engagement...)	Objective and measurable demonstration of impact	Very strong

## 2.5 EELISA Credential format

The EELISA Credential template issued is shown in Fig. 2. The design was driven by several aspects: with a naked eye, an external stakeholder should visualize immediately the SDGs and impact level achieved by the students, and it should include a summary of the activities in which the student has participated. The EELISA Credential comprises:

- Front page – It includes the identification of the student, University, a summary of the impact levels as defined in EELISA, and an ‘SDG-Impact Radar’ chart. It represents the impact levels achieved by the student and to which SDG they correspond. SDGs are represented as 17 equiangular sectors. Thus, after a quick inspection, it is clear if the student has focused on activities of a few SDGs (few spokes will appear) and the impact level (length of the spokes).
- Back page – A description of the EELISA Credential, number of activities completed by the student, maximum impact level achieved, which SDGs the student has worked with and which EELISA Communities have proposed the activities where the student has been enrolled.
- Annex – Information the activities carried out by the student is shown, including activity name and short description, dates, ECTS (if relevant), SDG addressed.

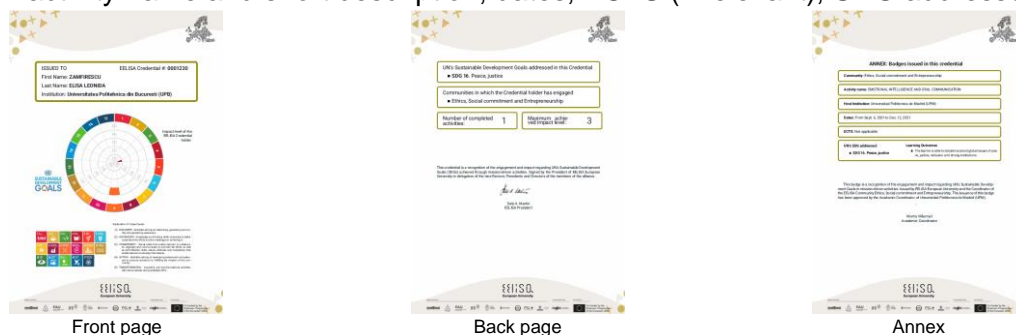


Fig. 2. Template of EELISA Credential

The EELISA Credential is signed by the EELISA President, and the badges issuance is approved by the Academic Coordinator of the institution in charge of the activity.

## 3 EXAMPLES OF ACTIVITIES IN THE EELISA CREDENTIAL

Some of the activities proposed by EELISA Communities in the framework of the EELISA Credential and available in the EELISA Communities portal [9] are:

- International Seminar on Urban Mobility (EELISA On the Move)
- AIRONE – Artificial intelligence in Robotics in Extended Reality Seasonal School in Pisa (Augmented and Virtual Reality for ENGINEERING – AVRENG)

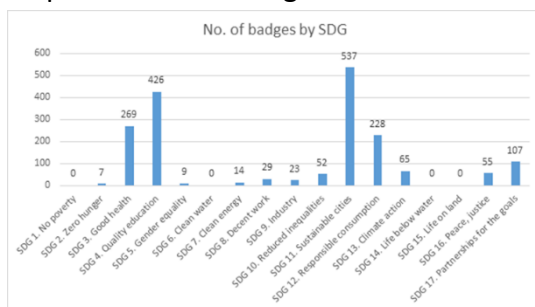


- Mathematical Approaches for SDGs (MATH4SDG) (SSERIES: Science for Sustainably Envisioning Reality and Information for an Engaged Society)
- Think Tank European Space Agency (Sustainable BCC. Sustainable Buildings, Cities and Communities (SUSBCC))
- HACK|BAY – A hackathon for everyone – challenge to improve children’s radiology experience (AI4HEALTH)
- Scaperoom 2022 – A vigorous escape from linear economy via international collaboration (Circular EELISA)
- Hackathon: Designing a sustainable Campus (Designing a Sustainable and Decarbonized University (DISCOVERY))
- Tech for Sustainability Campaign and Hackathon (STAR – Sustainable Territories through Action & Research)
- Global Challenge Action (Ethics, Social Commitment & Entrepreneurship)
- EELISA Science Fiction Short Stories Contest (Tech Diplomacy & Intl Cooperation)
- EELISA Days Challenge – Extreme Event Game (WATER in an era of change)

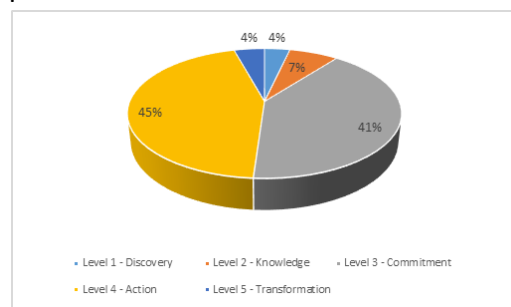
#### 4 KEY FIGURES OF THE EELISA CREDENTIAL

The key figures representing the status of the EELISA Credential to date are [10]:

- Number of credentials issued: **1231**
- Number of activities organized: **80**
- Stakeholders, problem owners involved: **69**
- Number of badges vs SDG: **1821** badges have been issued. As shown in *Fig. 3*, the concentration of badges around 4-5 SDGs clearly represents the areas where EELISA partners are willing to have a substantial impact.



*Fig. 3. Number of badges vs SDGs*



*Fig. 4. Number of badges vs impact*

- Number of communities and people involved: a total of **46** EELISA Communities involving **2453** people are currently (mid 2023) active in EELISA.
- Number of badges vs impact (*Fig. 4*): 85% of the badges correspond to Level 3 – Commitment and Level 4 – Action. In these first years, few activities tackling Level 5 – Transformation have been implemented.

#### 5 LESSONS LEARNT

During the set-up and first years of the EELISA Credential, we have learnt some lessons valuable to be shared:

- 1) Communication of the EELISA Credential to be known by students and faculty: Issuing badges for the EELISA Credential did not emerge as a driver of student engagement in activities offered by EELISA communities. It was the themes, the international aspect and the "non-routine" pedagogical mode that triggered their engagement, as well as the connection to the SDGs. For the teachers, the fact that the activities they proposed in the framework of the communities could lead to the delivery of badges for the EELISA Credential is an added value, a positive side effect but not a primary one. It is not trivial to make something extracurricular exist, given the fact that students are focused on the value of their traditional degree and their busy schedules. However, there is a space for a form of recognition of skills, knowledge and know-how acquired outside the traditional academic curriculum. Communication on the added value of the EELISA Credential must capitalize on what is expected by many companies (autonomy, taking initiative, working in groups), and on the expectations of the young generation of students in the 21st century (sustainable development, search for meaning, sensitivity to societal and environmental issues). It is on these expectations that we must make progress in terms of communication on the EELISA Credential.
- 2) Students' involvement: the academic load of students is quite high. Although the variety, interest and complementarity of the activities proposed by communities, the participation of students has been very limited. Not all the degrees recognize the ECTS achieved in an activity as part of the curricula. In addition, more innovative activities focused from problem or challenge-solving approaches would be appealing to have students on-board, as well as the possibility to cooperate in an international and multicultural environment with other students will enrich their experience. As well, it is important to communicate the realization of the activities in social media, in order to motivate potential students for upcoming activities.
- 3) IT tool/wallet: to store and stack-up the badges of the EELISA Credential and make them shall be shareable, an IT platform is required. Students should have a central site to look up the status of their credential and be able to share their achievements with whomever interested. When designing the EELISA Credential and its subdivision into badges, we were inspired by (among other things) open badges [11]. Open badges are digital certifications that recognize and validate the skills acquired by an individual. Open badges can be easily shared on social networks and professional platforms, allowing individuals to showcase their skills and experience to a wider audience.
- 4) Attraction of problem owners: in order to propose new challenges and make the EELISA Credential sustainable in the long-term, active problem owners must participate. These problem owners can be found in external stakeholders, society and non-governmental organization must be invited. As well, the fidelization of stakeholders to get involved in the definition of new challenges will naturally lead to increasing number of badges producing the highest impact (transformation). Synergies of the cooperation between students and stakeholders shall enrich the learning outcomes of the activities.

- 5) Recognition of EELISA Credential by the society and companies: once the EELISA Credential gets known by society as a differential and transformative experience, it will boost the number of students involved in the activities of the EELISA Communities and will attract interested problem-owners with appealing challenges to be solved.

## **6 CONCLUSIONS AND FURTHER STEPS**

In this paper, we have presented the EELISA Credential, which represents the “academic materialization” of innovative and transformative learning experiences produced by EELISA Communities and recognizes the student's engagement in activities that contribute to solving societal challenges framed within the SDGs.

The architecture of the EELISA Credential and its component badges is similar to the European Union's initiative on micro-credentials. Micro-credentials are envisioned as a new way to recognize and verify mainly informal learning achievement that any person has earned [12][13]. Micro-credentials are also associated to lifelong learning, where individuals might diversify learning pathways during the professional career.

The European Micro-credential is an initiative of the European Union to promote the recognition and validation of competences acquired throughout life, using a micro-training and certification approach [14]. It is a key EU initiative to strengthen the recognition of competences on a European scale, promoting a standardized and transparent approach to lifelong learning, certification and validation of competences.

There are many parallelisms between the EU micro-credential and the EELISA Credential badges: they are obtained through different modes of education/training, focusing on specific knowledge/competences, and the learning objectives underlying each activity are standardized.

The EELISA alliance intends to explore, in the coming years of its existence, the convergence of the EELISA Credential with this EU initiative, using this opportunity to highlight the knowledge and skills to be acquired in the field of sustainable development through the links between the SDGs and the EELISA Credential badges.

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