STEAME-ACADEMY: STEAME TEACHER FACILITATORS CERTIFICATION SUPPORTED BY EUROPEAN STEAME REGIONAL ACADEMIES

Gregory Makrides and partners

Abstract. *As one of the key factors that can develop competences and skills in school students, especially in grades 6–12, is the known interdisciplinary and multi-science project-based learning activity [6]. In the last 20 years we have seen the development from STEM to STEAM [8] and now to STEAME (Science, Technology, Engineering, Arts, Mathematics and Entrepreneurship) becoming the subject set that through project-based learning activity, is considered the kinetic energy for producing the creators and innovators of the future [2, 3, 7]. The catalyst in making this a reality are the subject teachers who need to develop related competence. The project STEAME Teacher Facilitators Academy (Ref. no: 101102619) developed a model through a network of regional STEAME Teacher Academies managed by the European Federation of STEAME Teacher Facilitators Academies, which can create the critical mass of professional STEAME teachers in support of the change in the curriculum in future schools [4].*

Key words: STEAME, PBL, Competence Framework, Certification, Training, Academy.

Introduction

The STEAME Teacher Facilitators Academies offers the training of service teachers and the training of student teachers together with a mentoring programme. The mentoring programme will create a networking between school education and university education and possibly industry, working together as co-creators for the sustainable development between teacher education providers impacting the quality of education in Europe. This is supporting the continuous professional development of teachers providing a micro-credential certification programme, already piloted in 2024 with the certification to 32 teachers.

The main results to be discussed in the report are:

1. STEAME Teacher Facilitators Competence Framework for teachers;

2. STEAME Teacher Facilitators Learning Modules/Workshops;

3. International Observatory for STEAME Learning Facilitators – The Federation Platform;

4. Mentoring and Certification Programme.

The STEAME PBL Approach

STEAME PBL method for competence and skill development can be an essential part of every pupil's curriculum [5]. Resources and training has been developed to support European teachers' knowledge and understanding of creating successful STEAME PBL learning programmes. It is also meant to assist schools in developing and implementing STEAME curricula [10]. In a traditional school curriculum, all or most of subjects constituting STEAME are taught separately. However social, economic, political, and cultural developments of mankind take place globally and seem to demand new approaches to education, including interdisciplinary learning activities.

Development of STEAME competence framework

The development process of the STEAME competence framework, given the need to have a transnational relevance, was designed to encompass three main phases, the design and development of the competence framework, the organization of focus groups in several countries to refine and validate it, and finally its application through its use in the development of a series of STEAME teacher professional development workshops, delivered in a number of different countries, to evaluate and promote its use in schools.

For the first phase of the development process, 25 STEAME/STEAM projects, mainly implemented by a transnational consortium and in their majority being funded by the European Union under the ERASMUS+ programme, were analyzed in-depth. The analysis of all the results and outcomes of these projects led to a set of competences that were deemed to be of importance for a STEAME educator. The collection of competences was further analyzed and grouped in a meaningful way to allow for a clear understanding but more importantly to be of added value as an in-

put in any design of a strategy for the development of STEAME teachers' professional capacity. The categories under which the competences were grouped were PLB for STEAME in context, PBL as a pedagogical approach to STEAME education, Student agency in STEAME PBL teaching, and Sustainability of PBL applied to STEAME. The 12 competences identified were Design and plan STEAME projects, Consider formal education standards in STEAME projects, Monitoring STEAM projects and reporting, Embed learning in meaningful and authentic STEAME projects, Support STEAME projects with the right learning climate, Involve students in STEAME projects, Promote student self-regulation and metacognition in STEAME projects, Engage and coach to support learning, Reflection on importance as a STEAME project facilitator, Apply creativity and innovation in STEAME projects, and Keep learning about STEAME projects and share knowledge (Figure 1).
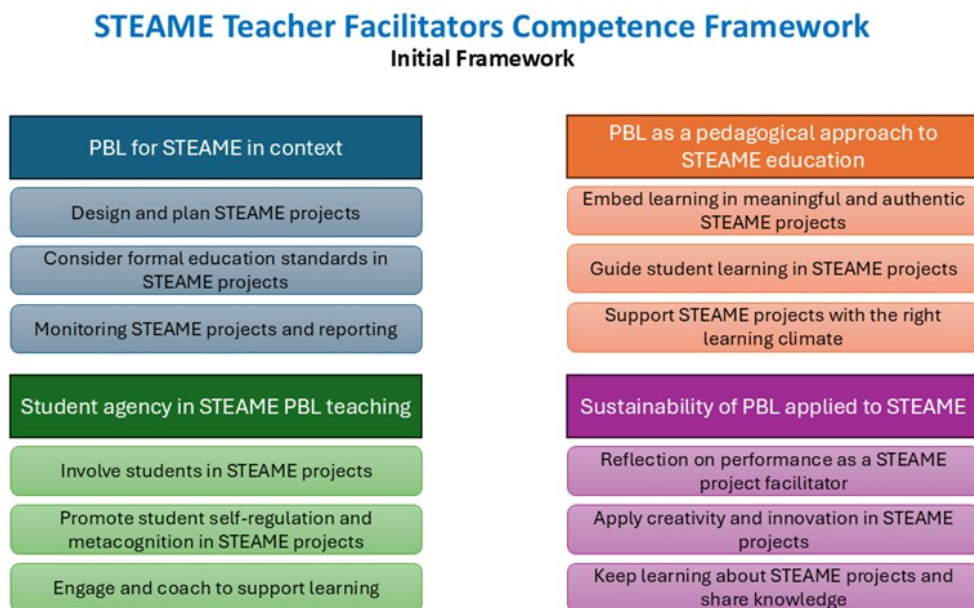

Figure 1. STEAME Teacher Facilitator Competence Framework – Initial Framework

Each competence was further specified as having a three-level scale of mastery, the performance levels. Each performance level was a statement regarding the ability of a teacher to apply in practice the competence in focus. An example of these levels, for the Design and plan STEAME projects competence, of the first competence area, is:

- Level 1: Partial integration of STEAME projects into the school's

culture, with some inconsistencies. Occasional involvement of external actors, with roles and contributions only loosely defined.

- Level 2: STEAME projects are fully integrated into the school's culture, aligning with existing practices and values. Regular involvement of external actors, with clearly defined roles and meaningful contributions to the projects [11].

- Level 3: STEAME projects are not only integrated but are driving forces within the school culture, inspiring continuous innovation and improvement. Extensive collaboration with a wide array of external actors, leading to groundbreaking initiatives and partnerships that transcend traditional boundaries.

Similarly, three performance levels were identified for each competence for the framework.

All levels of this initial STEAME Teacher Facilitators Competence Framework (competence areas, competences, competence's performance levels) were subject to validation through the focus groups, organized in several EU countries.

Training, L&C Plans, Certification

The teachers' professional development course "STEAME Project Based Learning: Learning and Creativity plan development", which leads to the acquisition of the "STEAME Teacher Facilitator" Certification, was offered on a pilot basis in 2024, supporting 32 teachers to receive this certification in the form of a micro-credential.

The STEAME PBL Competence Framework published on 31 March 2024 was the basis for the development of the first set of 14 modules/-workshops that service teachers and student teachers need to receive for developing knowledge and competence in order to become certified.

The Learning & Creativity Plans (L&C Plans) is a new name for Lesson Plans based on a template developed for the purposes of the project [1]. It is required that every L&C Plan is developed in cooperation by at least two teachers of two difference disciplines, integrating through a project scenario the use of at least two different subjects of STEAME.

Evaluation results and feedback from both the 32 teachers and the 360 school students involved were overwhelming to trust that this approach

has a future. The piloting report is used for the further design of the common certification programme that the European Federation of STEAME Teacher Facilitators Academies will be promoting from 2025.

The Federation Regional Academies

For expanding the impact and supporting the creation of a critical mass of STEAME Teachers in Europe who will facilitate the integration of STEAME PBL activities in school curricula, the project has established as a legal entity the European Federation of STEAME Teacher Facilitators Academies. This Federation as a membership organization consists of members who plan to set up a STEAME Teacher Facilitators Academy in their region. These academies can use the shared Observatory Platform with resources starting with 110 L&C Plans in 9 languages, 14 modules for training and workshops, video-learning, webinars in all EU languages, mentoring system, sharing and exchange. Regional Academies can function in their local language and support training and certification requirements to be submitted to the Federation for approving and issuing the certification.

Conclusion

The project continues to integrate resources, attracting regional academies to develop integrated resources into the platform observatory supporting at least 9 European languages.

Acknowledgements

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Gregory Makrides, PhD
Professor of STEAME Education,
Professor of Mathematics and STEAME Education,
University of the National Education Commission in Krakow, Poland
Corresponding author: `makrides.g@eaecnet.com`