

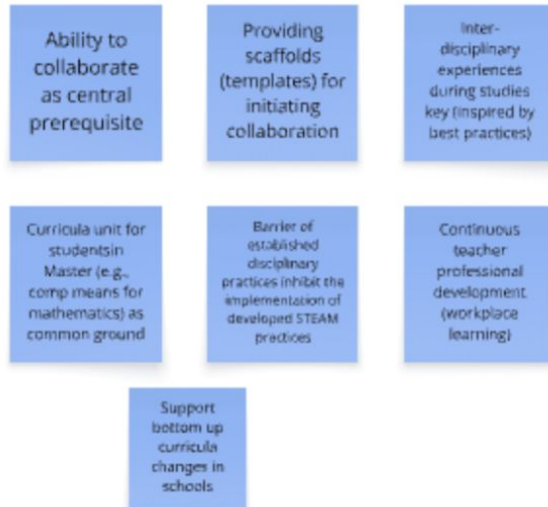
# STEAM Teacher Education WG

- **How can in-service teachers (in primary and secondary education) be supported and connected to foster interdisciplinary collaboration and effectively implement STEAM?**
- **What does initial teacher education need in order to support cross-disciplinary approaches and STEAM integration?**
- **What resources and framework conditions are necessary for schools to successfully implement STEAM education?**

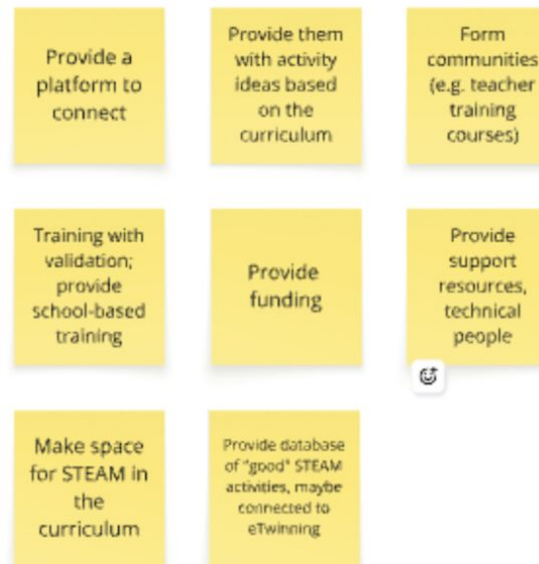
# STEAM Teacher Education WG

**Question 1 - How can in-service teachers (in primary and secondary education) be supported and connected to foster interdisciplinary collaboration and effectively implement STEAM?**

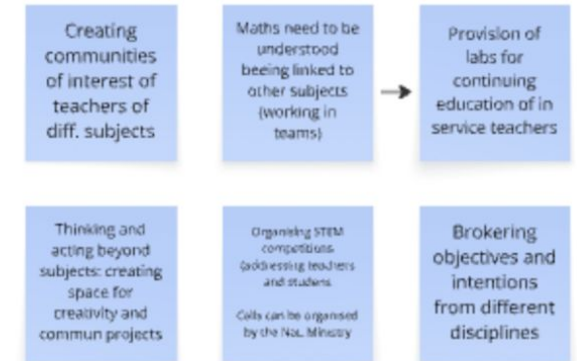
## Group 1



## Group 2



## Group 3



# STEAM Teacher Education - Q1

- **Group 1**

- Collaboration is a central prerequisite for effective STEAM practices.
- Scaffolds, such as templates, are essential for initiating collaboration.
- Interdisciplinary experiences during studies are crucial, inspired by best practices.
- A curriculum unit in Master's programs (e.g., computational methods for mathematics) can serve as a common ground for STEAM integration.
- Established disciplinary practices act as barriers to implementing developed STEAM practices.

- **Group 2**

- Provide a platform to connect educators and stakeholders.
- Offer activity ideas aligned with the curriculum.
- Create communities, such as teacher training courses, to foster collaboration.
- Provide school-based training with validation.
- Ensure funding and support resources, including technical personnel.
- Allocate space for STEAM in the curriculum.
- Develop a database of effective STEAM activities, potentially linked to platforms like eTwinning.

- **Group 3**

- Build communities of interest among teachers from different subjects.
- Emphasize the integration of mathematics with other subjects through teamwork.
- Provide labs for continuing education of in-service teachers.
- Encourage thinking and acting beyond subject boundaries to foster creativity and collaborative projects.
- Organize STEM competitions targeting both teachers and students.

# STEAM Teacher Education – Q1

- Collaboration and interdisciplinary experiences are essential for effective STEAM practices, with scaffolds like templates and curriculum units in Master's programs providing a common ground for integration.
- Overcoming barriers posed by established disciplinary practices is necessary to implement innovative STEAM approaches successfully.
- Platforms, communities, and training programs should be created to connect educators, provide curriculum-aligned activity ideas, and offer school-based training with validation and technical support.
- Funding, resources, and dedicated space in the curriculum are critical to supporting STEAM initiatives, along with databases of effective activities linked to collaborative platforms like eTwinning.
- Encouraging creativity and collaboration beyond subject boundaries can be achieved through teacher communities, continuing education labs, and STEM competitions, with national ministries playing a role in organizing calls to support these efforts.

# STEAM Teacher Education WG

## Teacher support Teacher Development

- Collaboration - Teachers - Different Subjects
- Curricula Freedom & Autonomy
- Workplace learning for teachers
- STEAM competitions at national level
- STEAM Labs for continuing edu.
- Teaching Resources & Learning materials
- Certification of recognition

Q2 & Q3

- Innovative pedagogies <sup>for teacher education</sup> <sup>for teachers</sup> ~~in~~ STEM edu.
- Collaboration between departments <sup>interdisciplinary courses including</sup> <sup>design</sup> <sup>implement</sup> compulsory STEM ~~education~~ education
- Offering learning opportunities for project-based learning, engineering design process, so on
- Time for teachers to develop their own STEAM teaching resources and to integrate ~~in~~ communities of teachers
- Strategic plans for teacher development courses in the school

# STEAM Teacher Education - Q1

- **InService Teacher Education and Interdisciplinarity**
- Collaboration (creating communities of interests) between different subject teachers and doing this as early as possible in their teacher education courses – joint reflection on innovative practices
- Curricular freedom and autonomy – schools and departments, teams – having space for creativity – leadership from principles and relevant authority
- Workplace learning for teachers – STEAM Labs in schools
- STEAM recognition - competitions at national level and relevant certification
- Teaching resources and learning materials

# STEAM Teacher Education Q2

- **Q2 - Initial Teacher Education**
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- Innovative pedagogical approaches of STEAM education for teachers and teacher educators
- Collaboration between departments to create/implement compulsory Interdisciplinary courses, including STEAM education
- Validated framework for the evaluation of STEAM activities
- Integrate STEAM in practice teaching - in the teacher education courses as inspiration

# STEAM Teacher Education

- **Question 3 - What resources and framework conditions are necessary for schools to successfully implement STEAM education?**
- Offer Project Based Learning, Engineering Design Process, Design-based Thinking, and Computational Thinking opportunities to be used in the classroom
- Teachers to be trained to use teaching resources available or to design their own teaching resources (e.g. STEAM lesson plans, hands-on STEM activities)
- Opportunities for teachers to integrate their own teaching resources designs into a community of teachers
- Strategic plans for teacher development courses in schools

# STEAM Teacher Education

- **Q3 - Resources and Conditions for STEAM in schools**
- STEAM labs at universities and schools - create community of resources - increase the cooperation and universities and schools
- Community based learning to bridge schools with the community and real world applications/learning
- Take into account of students interests, platform preference, and turn them into investigations
- Offer administration and documentation strategies as good practice examples - inspiring common practices

# STEAM Teacher Education



# STEAMCRAFT



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# STEAM Teacher Education

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