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# **Consolidated European Focus Group report with experts and teachers**



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## Consolidated European focus group report with experts and teachers

### 1. Focus Groups with education experts

In August 2021, the STEAME Goes Hybrid partners conducted 4 **Focus Groups with education experts** in which participated 18 experts. These Focus Groups were designed to investigate and analyze the existing competence frameworks and point out a set of competences that will empower teachers to implement the hybrid STEAME approach. Below we present the results of these events.

When the education experts were asked to list the most important competences that a teacher should have, they listed the competences below, but they all stressed that a teacher, first and foremost, should have a **solid content knowledge and teaching skills** – to build something sustainable, there has to be a solid foundation.

To the experts was presented **The Competencies framework for hybrid STEAME activities**. Experts from Cyprus noted that it covers a wide spectrum of competence areas and, particularly, regarding digital awareness and ethics; it includes both Ethical and Security skills; it presents a simple but scalable set of Digital Skills. They would like to add to **The Competencies framework for hybrid STEAME activities** simple system level administration and management skills (to be able to setup test beds) and upper-level computer programming (especially web technologies). Another aspect: the competencies list is too detailed. It is difficult for a teacher to have all these skills and competencies. The experts suggest to have levels of competencies which will help us categorize teachers according to their skills and knowledge (Category A teachers, Category B etc.) For example: Progressing learning (Foundation, Intermediate, Advanced, Expert).

The experts from Romania said that this competences framework it's up to the demands of the century, but, sometimes, it's quite demanding and high level for the level of education in Romania. They added that this competences framework seems too general and it should be completed with categories of competences, which would be more applicable.

Experts from Italy consider that the presented framework doesn't give enough importance to communication. Digital communication (taken from World Economic Forum: Strategic Intelligence – Education and Skills) is not enough. Communication is a transversal element in all educational contexts, including this one. Experts from Italy stressed that civic use of technology, ethics etc. (from DQ Competences framework) are transversal and must be included. When using digital systems that are shared and that also support relationships (among students, among teachers, between student and teacher etc.)



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these elements cannot be neglected. Italian experts consider that **The Competencies framework for hybrid STEAME activities** seems to be more suitable for individual training experiences rather than for classes and groups. It seems to forget the interpersonal level, the collective experience of learning/teaching. Interpersonal competences are almost absent, but they should be there as they are relevant and influence the results very much. The list covers enough the hard competences needed, the more technical related ones. Like the Romanian experts and experts from Cyprus, the experts from Italy suggested that the list should later be divided into areas of competences. They would add to this list of competences the emotional intelligence.

When speaking about **challenges/difficulties that can arise related to the development of the competences from The Competences framework for hybrid STEAME activities**, experts from Italy mentioned the absence of a suitable infrastructure: Internet connection, electronic devices, physical spaces that are not always suitable, especially in rural contexts, where the digital transition has not yet taken place. This problem was also mentioned by the Romanian experts, who added that the laboratories from Romania are not equipped. To solve this problem, it would be necessary to provide a digital transition plan in each training institution, within which to identify strategies for accessing subsidized resources dedicated to education. The second problem that was mentioned – many resources are mainly in English. Not all teachers speak English and this excludes them a priori from using some tools. If foreign languages, especially English, would be included in teacher refresher courses, this problem could be solved. Teachers are reluctant to change, and this is a huge problem, because after training, in Romania for example, about 30% of teachers do not implement anything they have learned. They don't see themselves as facilitators, they just pass on information. To help them keep pace with change, it would be necessary to support them on an ongoing basis, not just during training programmes. A similar problem was mentioned by the experts from Cyprus – teachers do not have enough time for trainings and to adjust the learning materials in a hybrid form. The solution – the learning material and the learning systems should be developed by other sources to support the teachers and the teachers would not have to do it themselves. For example: technicians can build platforms that can be very easy to manage, and the teachers can easily use without any specific knowledge. Italian experts also referred to the fact that the hybrid approach may be not very accessible to students with disabilities or special needs, this is why the tools to be adopted for a hybrid approach should be well selected in advance, taking into account accessibility as an essential element.

**Policy makers have an important role to play when implementing the Hybrid STEAME approach.** They can:

- come with economic resources to support STEAME hybrid learning and learners from socially disadvantaged backgrounds including digital equipment to all students and teachers.



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- provide teacher training and strong and precise guidelines.
- provide specific protocols and plans dedicated to the digital transition that are shared and relatively standardized. In this way, school managers would have concrete guides to refer to and practical tools to put in place.
- insert the effort of the individual institute within a planned and shared transition framework, with verifiable stages and concrete references. This is an epochal change that will have a great impact on the education system that cannot be faced in a fragmented and disjointed way. Policy makers can provide strong coordination, shared protocols, discussion tables during which individual institutes can discuss with their colleagues and with regional or ministerial stakeholders.
- provide new and more effective channels of communication with teachers.
- provide for teachers, in addition to training programs, necessary tools, guidance and constructive feedback, training and knowledge on how to implement project-based learning in a hybrid environment. Teachers should receive continuous support in implementing the hybrid STEAME approach.
- guarantee sufficient resources to support students with specialized personnel and purchase for them the necessary tools to guarantee their full and active participation even in hybrid classes.
- fund the use of platforms that suit best and buy them licenses. Also, they should help by funding technicians to create platforms manageable by the teachers for hybrid learning.
- digitize learning material and learning activities.
- provide mini labs to children.
- enhance the Digital Awareness curriculum for children and teachers.
- support change in higher education institutions, where future teachers are trained: support problem-based learning, not discursive approaches. There is too much theory and little practice. The research should be encouraged.

The final version of **The Competences framework for STEAME activities** is presented in the annex 1 of this document.



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## 2. Focus Groups with teachers

In September 2021, the STEAME Goes Hybrid partners conducted 4 **Focus Groups with teachers**, in which participated 24 teachers. These Focus Groups were designed to investigate the availability of teachers' involvement in project-based online and offline STEAME activities, their understanding of an integrated hybrid approach; focus groups designed to point out a list of appropriate set of tools that can assist teachers to facilitate the hybrid STEAME activities they will want to develop. Below we present the results of these events.

Due to the new conditions imposed by the Pandemic, teachers have had to adapt to a new way of delivering education. Various platforms or digital tools have come to their aid. **Teachers mentioned the following platforms or digital tools they have used:**

- **GSuite** for education package: Calendar – Meet – Classroom – Jamboard – Drive – Documents – Forms – Presentations – Spreadsheets. The tool was essential to cope with full-time distance learning made necessary by the pandemic but it has proved to be useful also in blended learning environments.
- **Edmodo.**
- **Zoom – Skype – Whatsapp** for video conferencing.
- **WeSchool** – compared to Gsuite, it is more difficult to recover student enrollments, but it is easier to assign tasks which can be better varied (gap filling, matching) than the limited functionality of, for example, Google modules.
- **Youtube** allows teachers to create their own channel and upload video tutorials. There has been positive feedback from students, so this is an opportunity that can be taken advantage of.
- **Mp4 recordings** for students and teachers to be used through **cell phones.**
- **Kahoot** for formative and summative assessment.
- **Escape room** scenarios for group activities.
- **Google Teams.**
- **Whiteboard.**
- **Geogebra** – software that can be used for research in Mathematics and Physics.
- **Google Classroom** – an all-in-one place for teaching and learning. It is an easy-to-use and secure tool that helps educators manage, measure and enrich learning experiences.



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- **Tracker** – video analysis software. It can be used in the courses of Physics, Chemistry and Biology and in project type works. It can also be used as a modeling tool.
- **Go-lab** – learning environment for utilization of virtual and real laboratories in exploratory activities.
- **Webex** – video conferencing, cloud calling & screen sharing tool.
- **Milage Learn+** – provides the students the opportunity to autonomously solve given exercises compiled in worksheets, while also supporting the teacher in managing classroom time.
- **Moodle** – free course management software, a Learning Management System or a virtual learning system, or more simply a software package for conducting online courses, which offers integrated asynchronous distance learning services.

When asked about their **views on the project-based approach in teaching**, the teachers from Cyprus mentioned that students can truly learn when they do something with their own hands and see that it's their creation, rather than just listening to information passively and without truly grasping and understanding what they are learning.

We quote some of their views:

*“I believe that project-based learning is the solution to the passive learning of the students. The problem is how to create the appropriate circumstances and find the necessary tools to implement project-based activities. These tools should also be easily accessible by the whole world and by all educational centers, meaning that they should be cheap if not free, in order to successfully implement project-based learning.”*

*“Project-based learning allows kids to learn things about themselves that they did not even know before. It exploits their creativity and critical thinking. We have seen this in project-based activities we implemented through our institution. Maybe if we have a pilot phase where project-based learning is implemented at the same time with the current education system then we can, maybe, change slow transition fully into project-based learning.”*

Another participant mentioned that through other projects in the past, they have done project-based activities with students and they were positively surprised by the results of their students. *“Students mixed two educational subjects to reach to results. They have connected mathematics with physics to reach to a conclusion. It was really amazing how they managed to do this on their own and understand how physics was related to math”.*



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Teachers from Greece commented that students often engage in project-based activities, something that did not stop occurring the years of the on-line learning due to the COVID-19 pandemic. Many of them, implementing a flipped classroom approach, utilise the project-based learning in their everyday practice. Especially, IB teachers, work with students, mostly by facilitating them to participate and complete individual and team projects. During the pandemic, they noticed that both themselves and their colleagues intensified their participation in seminars and professional development activities (e.g., Microsoft's Educator Certification – MCE) that further enabled them to effectively engage their students in project.

Teachers from Romania mentioned that the project-based approach in teaching is, for sure, an effective way of learning, but in Romania teachers do not have enough experience and the university does not prepare them enough for such an approach.

On the problem of the **STEAME project-based activities in a blended-learning/hybrid manner**, teachers from Romania unanimously said that it is very difficult to organize project-based activities in a blended-learning manner because of the absence of true human interaction. Students are not enough motivated to participate, because they want to see and feel certain things. Another problem related to project-based activities in a blended-learning manner is the evaluation – how can the teacher evaluate in an objective and efficient manner?

On the other side, teachers from Cyprus mentioned that the main problem for implementing project-based activities in a blended-learning matter is the lack of funding and the lack of interest by the authorities. Another problem is how the teachers can be motivated and trained to change their methods of teaching from the traditional learning environment into STEAME project-based learning. This will require time, patience, preparation, improving the skills of the teachers and train the teachers to learn how to implement project-based activities and especially in a hybrid approach.

Another opinion is that tools and infrastructure is not the most important thing. Teachers are the priority and after they can create material and have the necessary skills to implement project-based learning, then they will be ready to change the educational system and change the way students learn.



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In the table below, teachers listed **challenges/difficulties that might occur during STEAME GOES HYBRID project implementation phase** and **possible solutions to such situations**.

Challenges/difficulties you might face during STEAME GOES HYBRID project implementation phase and the piloting phase	Recommendations/solutions
<p>School system – structural and organisational rigidities</p> <p>Innovation "enforced" from the top</p>	<p>More funds to be allocated to school building investments and the provision of technological tools and environments (laboratories and fully-equipped disciplinary classrooms); exploitation of existing resources otherwise wasted; broadband enhancement to boost connection facility.</p> <p>Structural and organizational reforms in relation to flexibility of teaching schedules, students' timetables, and class management to allow co-teaching and adaptable class settings</p> <p>The difficulty in realizing interdisciplinary projects is also due to the implementation of unrelated national projects (the Civic Education program – School-work exchange programs), which create and overloading and disorientation in teachers. An integration and transversality of projects would make them more easily applicable. This is also true for the selection of topics that would lend themselves to the development of PBL activities.</p> <p>For example, the National Civic Education Plan for secondary schools is in line with the design method and some schools are already experimenting a vertical curriculum with specific topic areas for each grade.</p> <p>STEAME activities require the co-presence of teachers of different disciplines. Therefore, part of teachers' working hours should be available for planning and teaching together with colleagues. Not only for additional upgrading or remedial lessons of students, especially if conducted in a traditional 'face-to-face lesson'.</p> <p>A way to motivate schools to pilot and implement the STEAME GOES HYBRID learning methodology is by providing them certification. This certification process should be issued in a way that can be</p>



	<p>recognizable in other countries. The schools should meet some requirements and then can be eligible for this certification.</p> <p>If organizing the pilot phase as a contest with prizes for students, will not only motivate teachers, but also students to participate.</p>
<p>Difficulties for Teacher engagement in PBL (problem-based learning) projects</p> <p>Lack of skills for STEAME activities</p> <p>Little teaching professionalism</p>	<p>The difficulties in realizing interdisciplinary projects may be also due to the lack of flexibility of teachers, even if they are professionally very good. There's a lot of individualism. The challenge in innovating should not discourage those who believe in it from the need to hold on and get more and more colleagues to accept the challenge and experiment.</p> <p>Teachers' commitment is important, as the School Heads can do little if their teachers are reluctant in accepting innovation. Innovative interdisciplinary imply a step back from individualism and they require great patience and belief. These are not things that take place in a very short time. They have to be cultivated and they entail good professionalism. It is much easier and safer to do face-to-face lessons in the secret of a classroom.</p> <p>STEAME competences that are necessary and can be realistically acquired by teachers are related to soft skills and 21<sup>st</sup> century skills:</p> <ul style="list-style-type: none"> <li>- interdisciplinary skills and collaboration skills</li> <li>- literacy skills: financial-economic – civic – health – environmental literacies</li> <li>- Digital and cyber-security skills are linked to critical thinking skills (the ability to select information and detect fake news)</li> <li>- Innovation skills are based on creativity and problem-solving skills</li> <li>- Management and Leadership skills</li> <li>- Communication skills</li> <li>- Language skills for teachers to be able to access documents and collaborate in a wider context</li> </ul>



	<p>These skills can be acquired by teachers to varying degrees and in time. In a hybrid environment, digital skills consist in the use of technological tools and in the knowledge of their potential in the implementation of projects and activities.</p> <p>To minimize teachers' anxiety during the running-in phase of the projects, it is a good thing to make small units so as not to risk getting lost along the way. For those who try their hand at it, it is good to have the feeling that the undertaking is feasible because the enthusiasm phase may be followed by discouragement – and this is to be avoided.</p> <p>Basically, the most useful skills to be acquired are those necessary to govern the complexity and diversity inherent in a design approach to teaching and learning. The acquisition of skills like creativity and entrepreneurship for example are of extreme importance.</p> <p>However, at the basis of all projects there must be the core curriculum, the basics of the subjects and the basic fundamental skills for students to access higher levels of study. For a teacher, managing all the problems due to the complexity and variety of pupils in the classes requires good competence. As a matter of fact, though there is no longer such thing as 'the syllabus' to be taught, but guidelines and this should make the development of skills rather than mere 'subject matter' more manageable.</p> <p>In any case, to cut down anxiety, innovation should be introduced gradually: small steps at a time – initially with few subjects involved in projects and short and contained units during the running-in phase. So, those who try (teachers and students) understand that it is feasible and do not lose interest.</p>
<p>Compartmentalized teaching and learning</p> <p>Students' disinterest or demotivation in learning</p>	<p>When designing objectives and activities teachers should not aim too low, but teach high and give a lot so that every student will apprehend according to their interests and abilities. A low-level lesson is not beneficial for anyone, not for the weak, nor for the smart ones. Teaching needs to be diversified – naturally not through homogeneous classes – but through the assigning of diversified tasks, to value those who know how to do things and to encourage the less able. It's a challenge for teachers to be able to grasp in each child what is strong and positive and allow him to cultivate and externalize it. More so with disadvantaged children.</p> <p>The digital media certainly allow to do all this much better. It's a demanding job to be able to aggregate and work together in small steps.</p>



	<p>Compartmentalized learning can be avoided by the use of a method that is truly interdisciplinary and that gets the child become familiar with all-round thinking through projects, seeing different points of view, grasping in the various subjects what is useful in order to achieve a single goal.</p> <p>With the IT tools available, it is possible then to diversify activities; working on the programs of various digital platforms, content and classroom activities can be managed according to the various levels of the children, which are many. If there are smart children to be valued (the ones who get bored because they have finished an activity) there are ways to value them, giving them responsibilities. In this way, everyone has a job and is valued for this. They will be more involved, and their attention will be gained. It is important though for teachers to set small goals, so as not to lose them and be able to reach them always. Once the small objective is reached, something else can be added and goals expanded. Another strategy is to differentiate within the class by assigning different tasks which will all contribute to the creation of a common product.</p> <p>Not all activities can be blended, but in a well-equipped classroom, where children and teachers can work together, work can be done in different ways and there can be in presence and online activities simultaneously.</p>
Lack of adequate infrastructure	The authorities should allocate sufficient funds for the development of the necessary infrastructure.
The absence of collaboration between teachers from different areas	To encourage teachers to work and create together. To explain to them the advantages of working together.
Lack of time due to pressure from the Ministry to implement the national Analytical Program (AP). (Greece)	Can work around the issue if the pilot is in alignment as much as possible with the content of the AP.



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Lack of qualified teachers	Recruitment of teachers should occur early on to enable them to follow the project's progress and feel more comfortable to implement the project's content when the time for the pilot comes.
Improper use of cloud tools/platforms	Proper operation of the chosen tools that will be used to implement a hybrid activity.

Like the experts, the teachers expressed their opinion on **what the policy makers should do to support hybrid learning in schools, particularly related to STEAME activities**. Policy makers can:

- fund teachers' training in project-based learning. The teachers need motivation and chances for training.
- fund and motivate teachers to travel and gain training experiences on educational methods.
- allow automation and autonomy in schools in Cyprus. This way the results and feedback from students and parents will be the leverage to decide whether a teacher is good at his/her work or not and leave the school if the minimum requirements are not made. Right now, in Cyprus teachers are not evaluated or assessed in any way and nor there is a possibility for teachers to get fired. This does not allow motivation for change and development of learning methods to be synchronous and according to the needs of the times.
- allow the introduction of the assessment of students based on their portfolios, instead of the assessment based on one single exam.
- turn the education into a national priority.
- contribute to the rehabilitation of the teacher's role in society.
- equipping and supporting schools and households to upgrade their technological infrastructure and equipment.
- educating teachers, students, and parents of the proper use of technology in a learning context.
- proactive development of learning content to be used in on-line or hybrid learning environments.

The Covid-19 pandemic showed the need for fast and rapid transition to digital learning. The pandemic showed the lack we had in modernization of our education and digitalization. The final message is that innovation requires flexibility, less individualism, and more courage. Innovation must start from the school and even if it appears difficult and uncomfortable it can lead to



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significant results, that can be achieved in small steps through collaboration between teachers and manageable interdisciplinary programs.

It is fundamental to exert pressure for change on those at the top at the different levels of the Education system, but we should count on the gratification and satisfaction of the kids who listen and receive. The change in attitude of teachers brings positive results and changes also in the students. We must find a teaching methodology that can stimulate them all in the same way. A method that involves and interests them all is the only way. **In conclusion**, the solution to the hybrid learning is the training of the teachers, especially in the instructional design concepts and theory and gamification, for this reason it is crucial that teachers from all the fields of education collaborate and create learning material in groups, supported by the policy makers and together push the boundaries of the current education system to create the education of the future. This change should be holistic and not based on individual events.

Concluding, the following list of categories of competences resulted from the consultation and were validated as the STEAME HYBRID Teachers' Competences:

1. Teaching competences (plan the learning activities in a blended hybrid approach, organize teaching and learning activities, assess the quality of students' learning, self-assess of his/her own teaching performance to take informed decisions for improvement)
2. Developing inquiry-based and creative approaches (ask meaningful questions, generate ideas, generate and test solutions, and make decisions based on data to understand how to refine ideas further, look at and propose solutions to problems through multiple approaches).
3. Math and science subject-related and integrated competences (solve problems by highlighting connections between ideas and subject areas).
4. Engineering – design thinking, information literacy and ethical-healthy use of technology (identify the problem at hand, research potential solutions, build prototypes, test, redesign, test again, and iterate further as needed).
5. Critical thinking (analyze information, evaluate designs, reflect on thinking, synthesize new ideas, and propose new solutions, awareness about Information Technology, capacity for self-learn new tech, follow a strict code of ethics to protect their pupils from outsiders but also from within the group).
6. Communication and collaboration (sharing information and searching for solutions through interactions, use a language that is rich (but not difficult) are essential to get any message across, collaborating with colleagues, parents and social



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services, disposition to team-working, collaboration and networking: from distance or in person, teacher must have enhanced communication skills because of their involvement with students of various ages and level of knowledge).

7. Manifesting empathy toward students, interpersonal and emotional involvement and ability of controlling emotions, commitment to teaching, flexibility in approaches, and leadership (adapt to different needs of students, encourage their contributions, lead and inspire children in direct interactions or in an online and at distance environment).



### ANNEX 1: The Competencies framework for hybrid STEAME activities

STEAME HYBRID related Comp. Areas	Description of the competence areas	DQ Framework - Global Standards for Digital Literacy, Skills, and Readiness	World Economic Forum: Strategic Intelligence – Education and Skills	Microsoft K-12 Education Transformation Framework	DigiComp2.1	Intel® Education: Empowering the Next Generation of Innovators	Professional Digital Competence Framework for Teachers	Supporting teacher competence development for better learning outcomes	OECD Framework of the 21st Century Skills
Soft skills	Soft skills, also known as common skills or core skills, include critical thinking, problem solving, public speaking, professional writing, teamworking, digital literacy, leadership, professional attitude, work ethic, career management and intercultural fluency		social Innovation, Future of economic progress, science, innovation, computing, agile/ corporate governance	communication , problem solving, critical thinking	communication , problem solving, critical thinking	communication, problem solving, critical thinking, leadership	communication, problem solving, critical thinking, leadership	communication, critical thinking	critical thinking, problem solving, communication, leadership, professional/ work ethic
Digital skills	Digital competences and refers to the confident and critical usage of the full range of digital technologies for information, communication and basic problem-solving. (eg. electronic presentation skills, document process skills, internet navigation skills)	balanced use of technology, healthy use of technology, civic use of technology, data and AI literacy	digital economy and new value creation, AI, innovation, computing, data science, values, digital communications, IoT, digital identity	ICT use, basic skills practicing with ICT, information reproduction, ICT for knowledge construction, authentic users ICT product development	developing digital content, integrating and re-elaborating digital content, copyright and licenses, programming	technology design and programming, AI machine learning	facilitate students' digital skills development, can develop and administer their own digital identity, can guide the pupils in the development of their digital identity		information literacy, media literacy, ICT literacy



Creativity skills	Creativity is the ability to think about a task or a problem in a new or different way, or the ability to use the imagination to generate new ideas. Creativity enables you to solve complex problems or find interesting ways to approach tasks. (e.g. making connections, asking questions, making observations).	content creation and computational literacy	New value creation	Creativity, dealing with ambiguity	Developing digital content, creatively using digital technologies	Creativity, originality, and initiative	can transfer existing competencies to new digital environments, technologies and situations can contribute to the development of local steering documents, associated with teaching in a digital environment		creativity and innovation
Innovation skills	Innovation skills are practically the types of skills that allow individuals to become innovative in what they do. These are usually a combination of cognitive skills, behavioural skills, functional skills and technical skills. (e.g. Curiosity, creativity, risk-taking, and collaboration)	content creation and computational literacy	innovation, entrepreneurship, VR/AR, pandemic preparedness and response, social innovation, inclusive design, IoT	Strategic agility and innovation management	Integrating and re-elaborating digital content	Analytical thinking and innovation	can contribute to pupils participating in innovation processes, and thinking in new way through the use of digital technology, digital teaching materials, and digital learning resources		creativity and innovation
Leadership skills	Leadership skills are the strengths and abilities individuals demonstrate that help the oversee processes, guide initiatives and steer their employees toward the	Digital empathy	Agile governance	Building effective teams, motivating others, listening, negotiating,		leadership and social influence, emotional intelligence	can lead and organise teaching in a digital environment that is characterised by frequent transitions, and		leadership and responsibility, flexibility and adaptability



	achievement of goals. (e.g. integrity, accountability, empathy, humility, resilience, vision, influence, and positivity)			conflict management, organizing, planning, integrity and trust, decision quality and innovation management			adaptive and parallel learning activities at different levels		
Communication skills	Communication skills are the abilities you use when giving and receiving different kinds of information. (e.g. Active Listening, Networking, Emotional intelligence, Paying attention to the non-verbal communication)	relationship management, digital footprint management, online communication and collaboration, public and mass communication	digital communication, behavioral science	multi-modal communication, extended communication, provide supportive evidence, particular audience communication design	interacting through digital technologies, sharing through digital technologies, engaging in citizenship through digital technologies, collaborating through digital technologies, netiquette, managing digital identity	emotional intelligence	can develop good relationships in a digital environment, in order to create a constructive and inclusive learning environment, that fosters interaction, engagement, and a motivation to learn, can foster pupils' communication and interaction skills	negotiation skills (social and political interactions with multiple educational stakeholders, actors and contexts)	communication and collaboration, oral communication, written communication, social and cross-cultural skills
Management and Organisational skills	Organizational skills are the abilities that let you stay focused on different tasks, and use your time, energy, strength, mental capacity, physical space, etc. effectively and efficiently in order	self-awareness and management  Relationship management	infrastructure, sustainable development, agile/corporate governance, leadership	self-regulation, set long-term goals, plan work, revise based on feedback, managing vision and	Managing data, information and digital content; managing digital identity	systems analysis and evaluation	can plan, implement, and reflect on teaching in a digital environment, alone and in	planning, managing and coordinating teaching, <input type="checkbox"/> managing students and groups, monitoring,	Planning, setting goals, prioritizing tasks, incorporating feedback efficiently



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	to achieve the desired outcome (e.g. planning, communication, decision-making, delegation, problem-solving, motivating)			purpose, managing and measuring work, managing through processes and systems, organizing, planning, priority setting, time management, organisational agility			collaboration with others, based on steering documents, research, and experiencebased knowledge	adapting and assessing teaching/learning objectives and processes, Reflective, metacognitive, interpersonal skills for learning individually and in professional communities, Sense of self-efficacy	
Collaboration skills	Collaboration skills enable you to successfully work toward a common goal with others. They include communicating clearly, actively listening to others, taking responsibility for mistakes, and respecting the diversity of your colleagues. (open-mindedness, communication, organization, long-term thinking, adaptability etc.)	online communication and collaboration		work together, shared responsibility, substantive decision making, work interdependency  Building effective teams	Interacting through digital technologies, sharing through digital technologies, collaborating through digital technologies	Social-emotional skills	can contribute to strengthening the international dimensions of the school's work, by taking advantage of the opportunities digital arenas provide for learning and interaction, in a multicultural and globalised society, can develop good relationships in a digital environment, in order to create a	collaborating with colleagues, parents and social services, dispositions to team-working, collaboration and networking	teamwork



							constructive and inclusive learning environment, that fosters interaction, engagement, and a motivation to learn		
Problem solving skills	Problem solving skills refers to our ability to solve problems in an effective and timely manner without any impediments. It involves being able to identify and define the problem, generating alternative solutions, evaluating and selecting the best alternative, and implementing the selected solution. (e.g. analytical skills, innovative and creative thinking, a lateral mindset, adaptability and flexibility)		innovation	real-world problem solving, innovate, idea implementation , communication to outside audience	solving technical problem, identifying needs and technological responses, creatively using digital technologies, identifying digital competence gaps	complex problem solving, reasoning, problem solving, and ideation			critical thinking and problem solving
Critical thinking skills	Critical thinking is the ability to think clearly and rationally, understanding the logical connection between ideas. (e.g. Analytical thinking, Good communication, Creative thinking,	media and information literacy		interpreting, analyzing, synthesizing, evaluating	browsing, searching and filtering data, information and digital content, evaluating data,	analytical thinking, critical thinking and analysis	can critically discuss digital technology, digital teaching materials, and digital learning	critical attitudes to one's own teaching	critical thinking and problem solving



	Open-mindedness, Ability to solve problems, Asking thoughtful questions).				information and digital content, managing data, information and digital content		resources in a professional community, with an intention to developing subjects, teaching and the culture of the school		
Ethical skills	The quest for knowledge and action that defines right and wrong behavior (e.g. reliability, dedication, discipline, productivity, cooperation, integrity, responsibility).	digital empathy  Healthy use of technology  Balanced use of technology	values, sustainable development, understanding notions like inequality, human rights, gender parity, social innovation, climate change	Humor, compassion, integrity and trust, valuing diversity			can contribute to pupils' understanding of how digital arenas can provide opportunities for participation in democratic and cultural processes, can contribute to the pupils' development of digital judgement, and awareness of their responsibilities and right to participate	dispositions to promote students' democratic attitudes and practices, as European citizens	Reliability, productivity, discipline, responsibility, understanding of the ethical issues surrounding the access and use of information, media or technologies
STEAME skills	Science, technology, engineering, mathematics and entrepreneurship skills	Digital literacy	science, digital communication, climate change, digital economy and	interdisciplinary learning goals, interdisciplinary knowledge building,	Programming, developing digital content, interpreting and re-elaborating	technology design and programming, analytical thinking and innovation,	Can facilitate pupils' learning in and across subjects, based on the interplay between	epistemological awareness	Entrepreneurship, creativity, problem solving, critical thinking



			new value creation, entrepreneurs hip, leadership, innovation	creativity, technical learning	digital content, solving technical problem, identifying needs and technological responses, creatively using technologies	simulation and modelling	academic content, competence aims, digital technology, digital teaching materials and digital learning resources		
Cyber security and safety	Skills to identify the potential risks and are conscious of your personal security while browsing, sharing or surfing the internet. Being safe online means that you have the knowledge to identify the potential risks and are conscious of your personal security while browsing, sharing or surfing the internet. (e.g. technical aptitude, knowledge of security across various platform, attention to detail, communication Skills)	behavioral cyber-risk management, content cyber-risk management, commercial and community cyber-risk management, personal cyber security management, network security management, organizational cyber security management	digital identity, data science, cybersecurity		protecting devices, protecting personal data and privacy, protecting health and well-being, protecting the environment				understanding of the legal issues surrounding the access and use of information, media or technologies
Additional	Add any additional competence areas that		-				can contribute to strengthening the	teaching skills through	initiative and self-direction,



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I:	you find and relates to Hybrid System)						international dimensions of the school's work	content, transferable skills, commitment to promoting the learning of all students	productivity and accountability
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### Annex 2: Cloud tools/platforms for hybrid STEAME activities

Categories of tools/ CLOUD TOOLS – PLATFORMS	Collabo- ration	Communi- cation	Storage	Planning/ organisa- tional	Networ- king	Content Develop- ment	Assess- ment	Virtual Simula- tions	STEAME	Comments
Slack	x	x		x	x					
Teams	x	x	x	x	x					
Tasks	X	X		x						
e-Twinning	x	x	x		x				x	
To-Do-List				x						
Trello	x	X	X	x						
Kahoot	x	x	x			x	x		x	
Google Docs	x		x			x				
Microsoft translator	x	x			x					
Google translator	X	x	x			x				
Desmos Graphing Calculator						x			x	Graphs creator (functions-equations )
Canva	x		x			x			x	Templates for creation of CVs - infographics- logos- leaflets
Powtoon			x			x			x	Videomaing tool- export and share functions



Pixton			x			x			x	Creator of comics- graphic novels - presentations
Tableau Public		X	x		x				x	Data Analysis- interactive dashboards creation - infographic creation
Roxio		X	x			x			x	VHS-DVD convertor; video creation + editing; slideshow creation
goboard	x	x	x	x					x	video conferencing
H5P						x	x		x	
mentimeter	x					x	x		x	
Lucid	x	x		x	x	x				
Thinglink						x			x	Interactive content creation
Edpuzzle						x	x			Interactive video
Padlet	x	x				x				Collaborative digital notice board
Tracker						x			x	Video analysis software. It can be used in the courses of Physics, Chemistry and Biology and in project type works. It can be used as a modeling tool.
Whiteboard.fi	x	x								
Phet Colorado								x	x	Simulations
Geogebra						X			X	Software that can be used for research in Mathematics and Physics
Go-Lab	x					X			x	Learning environment for utilization of virtual and



										real laboratories in exploratory activities
Google Classroom	x	x		x	x		x	x	x	An all-in-one place for teaching and learning. It is an easy-to-use and secure tool that helps educators manage, measure and enrich learning experiences.
Zoom	x	x		x	x	X		x	x	Video conferencing software app
Webex	x	x		x	x					Video Conferencing, Cloud Calling & Screen Sharing
Milage Learn +										Enables students to access educational content in and outside the classroom.
Moodle	x	x	x	x			x			free course management software, a Learning Management System or a virtual learning system, or more simply a software package for conducting online courses, which offers integrated asynchronous distance learning services
Microsoft Forms				x			x		x	
Power Point				x		x				
Flashcards	x	x			x				x	
Minecraft	x				x	X		x	x	



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Jamboard	x	x		x	x					
Additional:										