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Introduction

The School Innovation Forum was created with the aim to establish a platform for exchange among key actors of the European Schoolnet community, connecting and empowering its members to explore and discuss topics connected to our focus areas and priorities. This platform has been a means to facilitate dialogue around innovative approaches to education, through technology, new learning environments, and sound pedagogy. Among all else, however, the Forum is an opportunity for this community to reiterate and strengthen its commitment and support for the idea of the Future Classroom Lab (FCL) as an inspirational learning environment that challenges experts, policy makers, and practitioners to rethink the role of pedagogy, technology, and design in the classroom.

The School Innovation Forum 2022 took place on 9-10 June 2022 at DoubleTree by Hilton, Brussels. The Forum brought together European Schoolnet’s and FCL’s main stakeholders as well as relevant project partners for two days of sessions and debates on the topic “Rethinking school innovation for future-proof learning”. Participants had the chance to learn more and share their input on topics such as: the importance of innovative classroom design, practical concerns about integrating technologies in the classroom, including ethical and sustainability issues, as well as the need to strengthen public-private partnerships and collaboration.

Key experts from both the public and the private sectors were invited to share expertise and discuss specific issues during the first day of the Forum. On the second day, participants engaged in more in-depth discussions in smaller groups with the objective of sharing to share good practices, forging collaborations between stakeholders, and looking into opportunities to expand the impact of the work that European Schoolnet is doing in particular fields.

About European Schoolnet

European Schoolnet is a network of 34 European Ministries of Education, based in Brussels. As a non-profit international organisation, we aim to bring innovation in teaching and learning to our key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners.

Our activities encompass three strategic areas:

- Providing concrete evidence and data in the area of innovation in education on which to base policy recommendations
- Supporting schools and teachers in their teaching practices
- Developing and sustaining a network of schools engaged in innovative teaching and learning approaches
Mr Durando highlighted the main achievements of the Future Classroom Lab (FCL) in the last decade and also looked at the challenges and opportunities ahead. In the context of the 10th anniversary of the FCL, he reminded the audience that the FCL was conceived in 2010 as part of the ITEC project, a European Union-funded project which involved education ministries, technology providers and research organisations and aimed to transform the way that technology was used in schools. Opened in 2012, the Lab offers a flexible learning space to rethink and redesign education and serves as a point of encounter among the education community. Currently, the FCL has 30 industry partners, a network of more than 100 Innovative Learning Labs, a training and teaching programme which has benefited over 7,000 people in the past decade, a network of more than 15 ambassadors, a validation programme, and a series of guidelines, produced and published by the FCL on a regular basis.

In 2014, the European Schoolnet Academy was launched in parallel with the FCL, to offer free professional development opportunities to teachers. So far, the Academy has developed over 75 courses, to which over 100,000 people have registered, and from which around 40,000 people have obtained a certificate.
Digital technology and digital education have gained a bigger role in the past years, especially during the pandemic. However, as Mr. Durando explained, technology is only one of the factors that can foster innovation and advancement in education. According to him, technology does not bridge inequalities in education on its own and diversity and inclusion should be addressed responsibly. Mr Durando reaffirmed the importance of further research on the use and management of data and insisted that sustainability must go “hand in hand with the advancement of education”.

10 years in numbers

- 6 learning zones
- 2,500+ classrooms across 20 European countries
- 50+ industry partners
- Lead Ambassadors in 15 countries
- 108 Innovative Learning Labs across 26 countries
- 425 average yearly participants
- 525 average yearly FCL visitors

European Schoolnet Academy

- 2014 launch year
- 75 MOOCs
- 165k enrolments
- 40k learners
- 98% positive ratings
- 95% reported their new knowledge to be useful
- 91% feel more confident and capable in class
Rehana Schwinninger-Ladak, Head of the Unit "Interactive Technologies, Digital for Culture and Education", DG CNECT, European Commission

Ms Schwinninger-Ladak commenced her address by highlighting the partnership of DG CNECT with European Schoolnet and with the FCL, in particular. Following up on Mr Durando’s speech, she mentioned the importance of new technologies such as Artificial Intelligence (AI) and Virtual Reality (VR), parts of which supported students in remote learning. On this note, Ms Schwinninger-Ladak mentioned that the period of remote learning had thrown light on issues such as: the need to provide training in digital competencies and the existing inequalities in accessing internet and connectivity. In her words, “technology by itself is not the silver bullet”, and as she later explained, technology must be properly embedded in pedagogy.

In addition, the Head of Unit stated that lifelong learning opportunities should become available to a wider range of people. With this in mind, the European Commission has put forward the Digital Education Plan to tackle some of these challenges. Moreover, as part of its 2030 Digital Decade objectives, the EC committed to making gigabit connection accessible for all EU citizens, and 5G network available everywhere in the European Union by 2030, and ensuring that all schools have access to stable and reliable internet connection.

The Head of Unit highlighted the role of teachers and underlined the support the EC is providing through funding and research. In the coming months, two guidelines are set to be published, one on tackling misinformation and the other on the use and management of data in educational settings. She also mentioned the important role the EC is playing in supporting Educational Technology (EdTech) companies, especially start-ups, through funding and projects such as IMPACT EdTech which supported EdTech start-ups in developing and validating technology solutions that are effectively integrated in educational settings and foster innovative teaching and learning.
Ms Burns opened her keynote address by reflecting on the challenges that schools and education as a whole currently face, such as safety and hygiene, supporting wellbeing, and the consequences of interrupted schooling. Moreover, she referred to a number of challenges that will be encountered in the long run, such as tackling inequalities, harnessing innovation, and preparedness for future eventualities and disruptions.

On the other hand, Ms Burns also highlighted the key opportunities that should be seized after the pandemic. First of all, the essential role of schools as part of the social fabric. Secondly, the innovation which was generated in teaching and learning, and which can foster changes in pedagogy and in teachers’ and parents’ interactions, among other effects. This innovation also raised questions about accountability. Nevertheless, the speaker highlighted that no matter how many digital solutions are put forward, physical interaction should be kept as a priority. In her speech, Ms Burns highlighted the role and relevance of teachers, and their training and skills development. On a positive note, the speaker shared data from the OCDE which shows teachers’ positive attitude towards change. That data, however, also highlighted the need that teachers expressed for further training in ICT skills.

Regarding trends in digital technologies, the speaker highlighted the importance of building technology that takes into account the needs of students, as well as diversity and inclusion. On the other hand, there
are risks associated with technology: exposure to data breaches, mismanagement of data, managing the digital divide, and debunking the myth of the “digital native”. In between the pros and cons highlighted by the speaker, Ms Burns mentioned some of the grey areas that require more research, such as the impact of screen time on children and the implications of coexisting with technologies such as AI, VR, and the Internet of Things.

Discussing the opportunities brought about by the two-year period of the COVID-19 pandemic, Ms Burns noted the renewed interest in wellbeing - both physical and emotional. This interest was manifested in several actions, such as the training in digital skills, the provision of healthy meals in school and the highlighted role of school counsellors. Resilience, she mentioned, has now become a key term in education. There is, however, a need to reflect on both of these aspects - well-being and partnership between schools and community in policy – together, a tendency which is already starting in countries like Norway, New Zealand, Czech Republic, US, and Belgium. The fourth key opportunity shared by Ms Burns was the new focus on and efforts to bridge schools' inequalities. The fifth opportunity that was highlighted was the chance to build a system of resilience that can adapt to challenges in an effective and pedagogically meaningful way. On this note, Ms Burns explained how this can be achieved through a regular cycle system which includes schools. In conclusion, she reaffirmed her optimism in the face of the upcoming challenges.

Beth Havinga, Managing Director European EdTech Alliance

Ms Havinga commenced her speech by enumerating a series of goals for technology in education. She first talked about a bottom-up shift in education. Some of the short-term challenges faced by the
education sector at the moment include the displacement of teachers and learners, fluctuating skills at graduation and the changes in workforce requirements. According to Ms Havinga, the private sector can certainly help bridge some of these gaps and add value to education owing to its agility, its ability to adapt to new needs, rather than to public budget, and more. However, she also admitted that there is mistrust in the private sector, because of the need for impartiality in education, the fear of commercialisation, and the unregulated behaviour of some stakeholders.

To address this, Ms Havinga proposed building an innovative ecosystem together. This will require defining transparency and boundaries in order to create a true climate of trust and cooperation. The EdTech Alliance published a report, which has found that such ecosystems are underfunded in Europe. However, the report highlights the benefits of those public systems which embrace public-private ecosystems. Ms Havinga called for a strong EU Edtech ecosystem which is user-centred, innovative, value-driven and focused on digital equity and accessibility, among other aspects. To make this happen, there is a need to keep sustainability and support as core values. This implies that funding must recognise both education and Edtech as important pillars of the system. It also needs to be forward-thinking, focusing on the long-term benefits for learners.

The Managing Director of the EdTech Alliance reflected on how private-public cooperation could thrive. For example, she mentioned values such as flexibility, efficiency, risk sharing, and promoting competition. Ms Havinga explained that there are different types of cooperation agreements, each pursued more frequently by different countries. She also outlined in her speech how trust could be built in this cooperation, with a series of guiding questions and critical thinking. In conclusion, Ms Havinga reaffirmed the role of collaboration (repetition with the following phrase), trust and clear guidelines in this cooperation between the public and private sectors.
Roundtable discussions

Schools and teaching in 2032: How can we continue supporting innovation in education in the next decade?

Participants: Patricia Wastiau, Principal Adviser for Research and Innovation, European Schoolnet (facilitator); Elisabetta Mughini, Director of Research, INDIRE; Maria João Horta, Deputy-Director General, Directorate-General for Education, Portugal; Lien Deelenheer, Education Lead Belux, Microsoft; Morten Søby, Senior Policy Advisor at the Directorate for Education and Training, Norway.

The round table focused on the lessons learnt from the COVID-19 pandemic and on how both public and private entities are supporting innovation in education after this period. Ms Horta drew attention to Portugal’s digital transition processes already in place prior to the pandemic. As a result, during the school closures, they were able to reach and support schools in an effective way. In Italy, stakeholders are now working to support a modernisation of face-to-face teaching in a process that also involves students. Representatives from Microsoft also joined the roundtable and spoke about the private sector’s contribution to supporting schools during the pandemic. The company developed a “transformation framework” on the basis of surveys and conversations with both teachers and students.

The entities represented at the round table all shared the same effort to include families, students and the wider education community in the process. Some examples of this effort were found in Italy, where parents are in continuous discussion and exchange with teachers; and in Portugal, where a specific
project, carried out by volunteer students, encourages the cooperation with families on the topic of safe use of the internet.

During the round table event, speakers also discussed the relevance of innovative spaces such as the FCL. Some speakers claimed that while there was a shared agreement on the need to rethink the learning space, schools were still being built using outdated teaching principles. As shared by one of the participants, “We build new schools with the old approach”. However, new initiatives are also being undertaken in some European countries, such as Portugal where spaces like the FCL are gaining momentum and as a result, the government is developing guidelines and promoting the utilisation of FCL elements like robotics and flexible furniture in schools. In Italy, part of the funding from the Resilience and Recovery Fund will go towards the building and adaptation of existing schools using innovative approaches with a vision of having smaller groups of children in bigger spaces.

A critical discussion on how the EdTech sector can better support education in the post-Covid world

Participants: Jill Attewell, Director, Technology & Learning Professional Associates (facilitator); Georgi Dimitrov, Head of Unit - Digital Education, European Commission; Martin Sønderlev Christensen, Head of institute, Institute of Didactics and Digitalisation, Copenhagen University College; Marine Rabeyrin, EMEA Education Segment Director, Lenovo

This round table focused on collaboration avenues between the public and the private sectors. As shared by Mr Dimitrov, the European Commission is currently working on the topic through a number of actions. For example, it has launched a stakeholder consultation, which includes families as well as the wider
community. It has also promoted work in the EdTech sector, through funding of projects and creating round tables on the topic.

As shared by Ms Rabeyrin, the private sector has its own concerns on collaborating with schools. For example, she mentioned that while they have responded to schools’ needs for supplies, there is a concern for the sustainability of mass production, and for the appropriate disposal of devices. However, as she concluded, there are great advances in technology, such as VR or e-Sports, which schools can embrace to foster innovation in teaching and learning.

A question from a member of the audience prompted the roundtable participants to reflect on the use of technologies in pre-school. On this topic, one of the speakers noted that while the early introduction of technology in the classroom can have its benefits, that would also mean that students will need to be prepared to be exposed to technology from such an early age. Another speaker suggested that pre-schools which want to introduce technology in the classroom should assess the available tools and find the right ones for that age group, possibly with the support of the private sector.

On the topic of teacher training, speakers reflected that there is a need to not only to provide funding for devices, but also to provide financial assistance for the services required to update and maintain them. The role of teacher training in equipping teachers with the right skills to use the devices was also emphasised. It was mentioned that schools are often approached by the private sector with a consumer mindset. In other words, they are seen as any other regular purchaser of technology. Instead, it was proposed that technology should follow pedagogy, making quality assurance a central aspect: “There needs to be a strong cooperation between the private and public sectors, so that we ask the right questions before introducing the technology”.

After reflecting on the cooperation between the private sector and schools, the speakers called for better communication between both parties. Given that there is a diversity of players in the field, each with their own needs and interests, more efforts should be made to bring the private and public sectors together.
Sabine Verheyen, Chair of the Education and Culture Committee, European Parliament

Ms Verheyen underlined the importance of moving forward and going past the pandemic. She drew attention to the Digital Education Action Plan, which considers teacher training opportunities. Looking at innovation in education, the Chair of the CULT Committee highlighted the sustainability aspect and advocated for an “eco-centred curricula”. She also called for immediate and decisive actions that take into account the voice of young people.

Jan de Craemer, Chair of European Schoolnet

Mr de Craemer highlighted some of the key lessons learned from the pandemic. One of them was the need for cooperation between the tech industry and the education community. He also reminded the guests that some of the biggest challenges that were faced during the pandemic were the access to technology and well-being. The Chair of European Schoolnet called for a stronger cooperation between the private and the public sectors and encouraged schools to be active not passive users of technology. He invited schools to become part of the conversation. As an example of the existing dialogue between the two, Mr de Craemer pointed to the FCL and the IMPACT Ed Tech project. On behalf of European Schoolnet’s Steering Committee, Mr de Craemer emphasised the organisation’s commitment to keeping the FCL as a central hub for offering training opportunities to numerous educators across Europe and beyond.
Day two – 10 June 2022

The second day of the School Innovation Forum 2022 was dedicated to exchanges and discussions between the members of the community. Each participant had the chance to join two workshops, each focusing on specific topics related to school innovation. The paragraphs below summarise the main takeaways from each breakout session.

School innovation, ethics, and sustainability

Moderators: Tommaso Dalla Vecchia, European Schoolnet; Konstantinos Andronikidis, European Schoolnet

The main objective of this workshops was for the participants to exchange views on the role that teachers, policy makers, and the industry have in making sure innovation in education happens in an ethical and sustainable way. In light of major European initiatives such as the Digital Education Action Plan and the European Green Deal, it is important that education stakeholders play a role in supporting the promotion of innovative pedagogy, in teaching and learning, and in ensuring that the technology and equipment in the classroom do not hinder plans towards net zero emissions or question the rights and privacy of teachers and students. In this interactive discussion, participants from different fields of education had the chance to share their views with the aim of developing a set of recommendations for the educational community to consider.

On the issue of sustainable development and the use of educational technology (EdTech), the participants focused on the existing and growing awareness around the issue, as well as the different levels of responsibility that manufactures, schools, and policy makers have. Companies already have access to materials, both for manufacturing the products but also for packaging, that are more sustainable and produce less emissions and waste. However, the participants highlighted the need for improvements to be made both from the side of the companies and from the policy and schools side with regard to procurement standards and use of products in the classrooms. Regarding the opportunities that exist, the participants mentioned the strong awareness around sustainability that the younger generations have and the impact that their advocacy can have on pushing for more change. Moreover, they underlined the opportunities that technology provides to raise awareness and train school staff as well as the available funds from European and national programmes that support re-use and re-furbishing programmes and a more circular approach to producing and using equipment. Finally, they stressed the need for more teacher training on the issue, de-politization of the debate and focus on the scientific evidence, along with more transparency and communication of initiatives and best practices.

The participants also had the chance to exchange on the issues of ethical and secure use of EdTech and aspects of privacy of students in today’s highly digitalised world. They exchanged about the existing and growing concerns around e-safety and the use and processing of data, as well as initiatives from some companies to integrate elements of “privacy by design” in their products. However, more needs to be done to improve the situation, especially with regard to communicating to teachers and students the dangers that some tools can expose them to, how to avoid these risks, and how to be able to assess and
understand whether a product is safe to use or not. The participants noted that in many cases, safe alternatives do exist and can be accessed by educators but there is a need for school authorities to improve their communication strategies so that more teachers become aware and use them. Moreover, the participants emphasised the need for more guidance and training of teachers on the safe and ethical use of EdTech, and on the policies and regulations such as the GDPR and other existing guidelines by international organisations on the proper integration and use of technology such as Artificial Intelligence (AI). With respect to AI, the need to agree on the purpose and role of such technology in education was raised together with concerns about potential misuse of students’ data and discrimination issues. Linked to that, the participants in the workshop underlined the need for EdTech companies to develop products that adhere to ethical guidelines and are wherever algorithms are involved trained on non-biased data. Furthermore, they stressed the need for companies to be accountable not only for designing secure products but also for the actions that these systems might take or conclusions they might make that can affect students’ privacy, development, and well-being. As a result, improving trust between the public and the private sectors is fundamental.

Connecting the dots between two distinctive sectors: industry and education

Moderators: Romane Leautie, European Schoolnet; Ivana Kovac, European Schoolnet

During this workshop, the participants had the opportunity to enrich their knowledge and share their views on the trends that bring the industry, and the education community closer together. Various examples were discussed. Two leading questions guided the audience in its reflection:

- Where is the innovation in education coming from?
- How to foster successful collaboration between the industry and the education sector?

We were glad to have an international audience which represented various viewpoints from the public and private sectors. European Schoolnet presented two examples of successful industry-education collaborations: the STEM Alliance and the IMPACT EdTech programme. Four guest speakers (start-ups) also shared their views and success stories: Elias Robot, Notebloc, Kotokan, and Key2Enable.

The discussions were punctuated with many new ideas and concrete examples of how to connect the industry with the education community. The participants reflected on pilot projects, co-creation camps and test-beds, but also questioned the current state of affairs – what could we do differently to remove barriers and facilitate innovations, how can we encourage school leaders to foster innovation? The need for stronger connection between the industry partners, who can give insight and guide us into jobs of tomorrow, and the education community was also examined.

One of the conclusions we could draw from the discussions would certainly be the necessity to adapt the curricula and methodology to the innovative solutions coming from the industry. To have our teachers equipped to introduce innovation in their teaching, we need to train them for the new, adapted role, for which a detailed gap analysis fostering dialogue should be the starting point.
Future Classroom Lab as an accelerator or hub for innovation

**Moderator:** Bart Verswijvel, European Schoolnet

In this workshop we looked at the types of initiatives, taken by many organisations and institutes from all over Europe, to create learning spaces inspired by the Future Classroom Lab in Brussels. Two types of venues have been created. First, there are Future Classrooms for residents of, for instance, a school. These spaces can be used by students and teachers as part of their daily routine. On the other hand, there are FCLs for visitors, who, for instance, take a training and then return to their own context. The participants in the workshop discussed how these two types can be most effective and be an accelerator or a hub for innovation.

Some recommendations brought forward by the participants on these questions:

**How can changes and investments in design and edtech accelerate innovative practices in Future Learning Spaces for residents?**

- Invest in initial teacher training.
- Include the voice of the students as innovation promoters and decision makers.
- Work with industry partners to provide professional training for teachers on the pedagogy behind quality IT-enabled teaching and learning.
- Investments should be made from a school/holistic perspective supported by a policy.
- Encourage and support school leaders.
- Have a focus on students in the first place.

**What recommendations can we give to build effective training hubs to support teachers and schools?**

- More trainers needed to train teachers in new pedagogical approaches and new technologies.
- More opportunities for companies to showcase products and discuss with teachers.
- Work more with school leaders.
- Trainings make sense if the schools have same technology tools at their disposal.
- Set up a library system for schools to borrow technological tools.
- Let teachers take their own students to a training.
- Help teachers develop an activity and support them with equipment for a trial.

**Whole-school mentoring for school improvement**

**Moderators:** Anna Laghigna, European Schoolnet; Enrique Martin, European Schoolnet

Transferring and scaling innovation related to digital technologies in school education is an ongoing policy challenge across Europe. As nowadays a great number of advanced schools have already developed efficient frameworks for technology-enhanced teaching and learning, such schools could now be ready to take up a leading role within mentoring clusters to guide and support less-advanced schools on a transformational journey for school improvement. How could this be done? What benefits and challenges to expect? What type of support can come from policy-makers/shapers?
During the “Whole-school mentoring for school improvement” workshop, framed under the Mentoring Policy Exchange Mechanism of the MenSI project, participants had the chance to discuss and exchange ideas on how whole-school mentoring can support school innovation through the mainstreaming of innovative digital teaching practices and peer networking.

Some of the key aspects tackled by the participants are connected to the different areas of school-to-school mentoring and the necessary elements for its implementation.

**Benefits:** Help create a common vision to accelerate innovation, develop a supportive culture and a mindset for lifelong learning.

**Technology:** Need for secure spaces and sustainable sharing of resources.

**Incentives & resources:** Time and flexibility, tools and training but also recognition and financial incentives for the schools and teachers involved in the mentoring activities.

**Policy support:** Direct funding and project initiatives, adaptation of regulations and acknowledgement and promotion of school mentoring and networking.

Regarding the challenges, the following four elements which had been previously identified by partner schools participating in the MenSI project pilot were highlighted:

- initiating dialogue to overcome scepticism towards mentoring at whole-school level.
- integrating mentoring practices in the whole school system.
- time management and excessive workload.
- sustaining inter-school collaboration in the long run.

Finally, participants agreed on the importance of developing, expanding and sustaining the mentoring approach for school innovation as a strategy that can contribute to forging collaborations between the many stakeholders involved in the transformation of educational policies across Europe.

**Learning and playing in a digital society**

**Moderators:** Sabrina Vorbau, European Schoolnet; Viola Pinzi European Schoolnet; Jurgen Baensch, Director of Policy & Public Affairs - ISFE

Viola Pinzi, the project manager at EUN for the Games in Schools project, and Jurgen Baensch, Director of Policy & Public Affairs at ISFE, introduced the core topic of learning through and with digital games in educational settings by presenting some key activities and findings from the last few years from both organisations. The Games in schools project focuses on teaching through digital games, in particular, through using available commercial games (COTS) embedded in broader learning activities. It was able to reach thousands of educators in Europe mainly through the three editions of the related MOOC. A new iteration of the project is expected in the coming months, with an expansion of the core topics to include also online safety and inclusion aspects. In recent years, ISFE activities have been focused on sensibilisation and awareness raising campaigns around responsible game play (with several localised versions of the campaigns at national level) and around making reliable information on digital games available to a larger audience (young people, parents, educators etc.) through the PEGI system (Pan-
European Game Information), a self-regulatory age-rating system for video games, also used by major game platforms as part of their parental control tool systems.

After these first presentations and a round of considerations, the participants were invited by Shahneilla Saeed (Head of Education, UKIE, UK) to debate on the topic of digital divide and how this may relate to the use of digital games in education. The exchange was prompted by questions such as: Does ‘game-play’/game-based learning create a greater digital divide for those who can’t effort it (at home)? How great is the digital divide in schools?

Main take-aways from the discussions were as follows:

- The importance of enabling educators to embed digital games in their day-to-day activities and to support them in acquiring basic understanding of what digital games are, their mechanics, how to assess them (mechanics, content, age appropriateness etc.) and how games can support students’ engagement and peer learning.
- The fundamental role of the community, within and outside of schools, as an enabler for learning and for playing, including peers (other young people and fellow students), families and the education community at large.
- The use of games to support inclusion; the digital divide should not be relevant given that digital games are accessible to everyone in the education context (as it should be for any educational tool) and embedded in the learning activities in a way that allows all learners to contribute with their own competence; playing the game should not be the focus of the learning activity, but a mean to reinforce engagement and motivation, for example.
- The importance of game playing as an additional opportunity for experimentation, exploration, and awareness for young people, including the possibility to challenge boundaries in a safe, collaborative and supportive environment.

**Reviewing Computational Thinking in Compulsory Education**

**Moderators:** Katja Engelhardt, European Schoolnet; Milena Horvath, European Schoolnet; Eugenia Casariego Artola, European Schoolnet

During the workshop, the main conclusions of the study “Reviewing Computational Thinking in Compulsory Education in Europe” were presented, along with European Schoolnet’s initiatives aimed at promoting CT activities such as the European Schoolnet Academy courses, dedicated projects (Code Week, BIK, among others), advocacy, and research. The presentations were followed by a lively debate on how to integrate Computer Science (CS) concepts and Computational Thinking (CT) activities in school curricula across Europe. Amongst others, experiences from Denmark, Luxembourg, and Spain were shared. In Denmark, CT activities were extensively piloted, while Luxembourg prepares a new subject around ‘Digital Sciences’ and Spain will start implementing a new curriculum next year. Discussions centred around the definition of CT, how to best integrate CT activities in the curricula, the actual integration of CT activities in schools, and questions related to teacher training.

1. **Defining CT:** The question of definitions was discussed. Some participants shared the view that the term ‘CT’ offers the merits of emphasising that CT is all about the thought process rather than
about the technical skills. As has been highlighted, there is still no agreement on what term to use or on a single common definition of CT.

2. **Approaches to integrating CT in the curriculum:** Cross-curricular approaches to integrating CT activities have been highlighted as particularly interesting by several workshop participants. The relevance of CT skills for a variety of subjects and fields beyond STEM subjects was emphasised in the discussion. Several workshop participants agreed that learning about CS concepts and CT skills has the potential to enhance learning of other subjects. According to one of the industry representatives, CT activities using robotics can be integrated in any subject, provided that relevant materials and instructions are available.

3. **Differences in the implementation of CT activities between schools:** One key challenge identified by the report was that substantial differences remain in how CT activities are implemented in different schools, even in countries where CS education is compulsory. This finding was also echoed by some workshop participants. More monitoring and research will be crucial to better understand how CT activities are implemented in schools, as one of the workshop leaders highlighted.

4. **Teacher training:** The report identifies teacher training as one of the main challenges to the integration of CT in schools across Europe. This finding was echoed by some workshop participants. In most countries, trainings on specific subjects are not compulsory. Hence, the question of how to motivate teachers to attend them remains key. Another question is how, when, and where it is best to organise these trainings. A possible solution proposed was to have the trainings integrated in the school year plan. One key question in teacher training is what kind of trainings will prepare teachers to teach CT and related skills in a way that advances the curricular goal of fostering problem-solving skills. As one workshop participant highlighted, teachers also need support in developing a positive attitude towards teaching something new in a classroom where some students might know more than them.

In conclusion, there was a general feeling that the integration of CT activities has come a long way in the last years, despite the related challenges discussed during the workshop. As a closing remark, one of the workshop participants pleaded for everyone in the room to convince stakeholders in education of the importance of Computer Science Education and CT skills.

### The competences and roles of the post-Covid 19 teachers in STEM Education

**Moderators:** Evita Tasiopoulou, European Schoolnet; Barbara Quarta, European Schoolnet; Miriam Molina, European Schoolnet

During this workshop, the participants reflected on the impact of the pandemic on teachers’ roles, explored innovative practices in STEM Education and engaged in meaningful discussions with the objective of sharing recommendations, looking into opportunities for collaboration and teachers’ professional development. The following initiatives were presented and discussed:

- The **STE(A)M-IT** project and STEM careers advisors’ network: an interdisciplinary STEM approach involving policy makers, teachers, school leaders, career advisors and industry.
The **Scientix** project and its **STEM School Label**: a tool to guide schools in improving their STEM education strategies and activities and forge connections with STEM stakeholders.

The workshop was highly interactive and hands-on to allow for maximum exchange and collaboration among the participants. The workshop produced some recommendations from the key stakeholders on how to improve the presented practices and tools, better promote innovation in STEM Education and enhance teachers’ competences and practices. Among these recommendations,

- Provide high-quality and tailor-made professional development training opportunities, educational resources, tools, and services answering the specific needs and context of the teachers.
- Offer more peer learning and lifelong learning opportunities to teachers with focus on the pedagogies in using educational technologies and to make teachers feel more confident in using technologies in an innovative way.
- Invest more in translating and disseminating high-quality educational resources.
- Offer resources and activities that are compatible with specific curriculum requirements or are developed in a way that allows teachers to adapt them to their own reality.
- Potential solutions to address teachers’ shortage in some countries; involve external experts in the STEM Labs of the schools to support teaching staff.