

REPORT ON THE STEM HIGH-LEVEL EVENT 2019 “FOSTERING INDUSTRY COOPERATION WITHIN STEM SCHOOL EDUCATION STRATEGIES”

This report provides an overview of the STEM High-Level Event 2019 – a two-day conference in Malta, organised around the topic of a school-industry collaboration in STEM education. The report summarises the key points and main outcomes of the discussions that took place during the event.

Table of Contents

About the event	2
Plenary opening.....	3
Keynote address	4
Parallel sessions.....	5
Session 1: Contextualisation of STEM education in Europe	5
Session 2: Exploring future scenarios for STEM skills	6
Session 3: Strengthening STEM community	7
Round Tables	9
Round Table 1: Making a cooperation between Ministries of Education and industry a norm in European education	9
Round table 2: How could Europe support the STEM education agenda in all countries	10
Closing Remarks	12
Organisers of the STEM High-Level Event 2019	13

About the event

Brought together in Malta, around **120 STEM education actors** took part in the **STEM High-Level Event “Fostering Industry Cooperation within STEM School Education Strategies”**¹ organised by the SYSTEMIC,² Scientix³ and STEM Alliance⁴ projects as well as Transport Malta,⁵ the Maltese Ministry of Education and Employment⁶ and the Science Centre Pembroke Malta.⁷

This event gathered key stakeholders from industry and education, as well as national and European policymakers, to promote the European STEM education agenda on a political level.

In the course of the event, Ministries of Education, industries and other STEM actors

- ✓ Exchanged best practices of STEM initiatives and networked to find synergies for future new collaborations in STEM education
- ✓ Discussed how they can support the development of STEM education actions at European level for higher sustainable growth and more innovation
- ✓ Shared innovative practices regarding STEM education developments and promoting STEM careers to create a future workforce

Participants from 26 countries, including **16 representatives of Ministries of Education**⁸ and **18 companies** (Cisco, Transport Malta, Texas Instruments, INEOS, Repsol, Dell, LEGO Education, Samsung Electronics, Makeblock, Microsoft, Oracle, Jobiri, EPCA, GSMA, EPCA, IBM, Amgen and Vodafone) as well as policymakers, researchers, teachers and school principals took part in the event.

¹ www.stemalliance.eu/high-level-event-2019

² www.eun.org/projects/detail?articleId=719293

³ www.scientix.eu

⁴ www.stemalliance.eu

⁵ www.transport.gov.mt

⁶ <https://education.gov.mt/en/Pages/educ.aspx>

⁷ <http://sciencecentremalta.net/>

⁸ Austria, Belgium (Flanders), Czech Republic, Denmark, Finland, Greece, Hungary, Italy, Lithuania, Luxembourg, Malta, Portugal, Romania, Spain, Spain (Catalonia) and Turkey.

Plenary opening

The Maltese Minister for Education and Employment, **Evarist Bartolo**, underlined the crucial need to contextualise the work of schools and industry in order to support sustainability. He pointed out that STEM should be a major force to advance sustainability on the planet and that whatever we do in this field should be centred around sustainability goals.

The Maltese Minister for Transport, Infrastructure and Capital Projects, **Dr Ian Borg**, provided the audience with valuable insights into the skills challenges of the transport sector. According to the Minister, there is a severe need for skilled personnel to handle all specialised profiles in this area, ranging from technical to service positions and infrastructure. He therefore pleaded for more specialised education and training for the future generation. To bridge the gap between competences and actual profiles, the Minister pointed out that there is a need for more school-industry collaboration.

The CEO of Transport Malta, **Joseph Bugeja**, argued that in the past, commitment was critical for employment. Today, however, young people have numerous opportunities. That is why Malta has embarked on a campaign to advertise STEM careers. The idea of embracing industry and education is fundamental in bringing students up-to-date with currently available careers and a realistic vision of industry.

Stefaan Hermans, Director for Policy Strategy and Evaluation in DG EAC at the European Commission, confirmed the increasing interest in science and scientific evidence. In fact, there are more and more jobs created that deal with STEM topics. Yet, he regretted to say, “When we look at the data in terms of skills, we see that one fifth of the population has low basic skills. Even the EU’s high achievers are scoring low in comparison with other continents.” He further drew attention to the fact that despite all the investments made by the Commission and others, Europe is still “lagging behind” in research. Although there have been improvements, the EU is still behind when compared with other global actors like Japan or the US. This is why it is so important for the EC to bring people together, raise awareness and commit to keep supporting the STEM research and education agenda. He thus noted that the *Horizon Europe* and *Erasmus+* programmes will continue on this line, the latter aiming to triple the number of its beneficiaries. Moreover, the Commission has announced a budget increase for science, research and learning opportunities from 2021 on. Most importantly, however, Mr Hermans concluded, the difference comes from the ground, that is, teachers, pupils and everyone else involved in education.

Keynote address

Anja Monrad, Chair of the Governing Board of the Digital Skills and Jobs Coalition as well as Senior Vice President and General Manager of Dell, had prepared a video message, in which she underscored that STEM provides great opportunities for a better future. There are many new businesses in Europe that will need skilled employees. With regard to artificial intelligence (AI), she explained, the partnership between humans and machines is continuously growing. Beyond these developments, Ms Monrad made clear that STEM education has to be for everyone, taking into account gender equality, which is also a priority of the Commission's Digital Skills and Jobs Coalition.

In her keynote speech, **Alexa Joyce**, Director of Education System Leaders at the Microsoft Corporation, called on the audience to empower the students of today to create the world of tomorrow. What needs to be done is to take away fear of science and technology and instead harness the power of STEM, AI and new discoveries, which allow us to create incredible opportunities for future generations. At the same time, the broader skillset for future jobs continues to change. While repetitive jobs are in decline, new jobs increasingly require creativity, an ability to work together and the courage to break down boundaries. Ms Joyce suggested focussing on, among other things, bringing together content mastery and technical skills. She also noted the need to be more empathetic as well as more receptive. When it came to education, she declared that transformation has already happened, but just not everywhere. The learning shift is happening right now, as technology helps us become more adaptive to students' needs. She thus highlighted that we all need to celebrate teachers who help us "take things to the next level". Giving several examples, like *Micro:bit*, the *Define a Square Project* or the use of the online game *Minecraft* in education, she pointed out that there are projects that not only make "the digital" tangible but also tick all the boxes in terms of skills development, from gaming to computational thinking. Regarding gender issues, she pointed out that it is again teachers who can play a critical role and mentioned gender-oriented teacher training. Finally, she underscored that role models, who share their passion and show opportunities, are of utmost importance.

Wrapping up, **Marc Durando**, Executive Director of European Schoolnet, talked about how we can scale up all mechanisms established by projects conducted in the past and pointed to systemic strategies, like teacher mentoring. Ministries of Education (MoEs) need to allow time for this to happen and give recognition to teachers. He appealed for changes in continuous professional development. In addition, country differences in terms of accreditation of courses pose a serious obstacle that could possibly be tackled with a common European Certification System, initiated by the European policymakers.

Parallel sessions

Session 1: Contextualisation of STEM education in Europe

Yves Beernaert is a former member of the European Commission's Directorate General (DG) Research Science Education Expert Group and a Senior Education Consultant at Educonsult. He started his intervention by analysing the status quo, in which he observed a clear lack of a number of important factors such as students' connections to the real world in companies, their awareness of what types of STEM jobs exist, knowledge on how to apply STEM skills in other fields, connections to STEM professionals, a lack of student opportunities, in particular for girls, and finally, schools' and teachers' lack of competences to develop interdisciplinary approaches. Subsequently, he referred to the STEM Alliance's *PGB2S*⁹ scheme, which closes the gap between industry and education sectors. He noted that the scheme raises awareness on STEM careers among both students and teachers. Two guides had been developed, one for schools, one for industry, as well as a tool to help teachers get in touch with companies. He also listed some of the advantages for companies, such as having a direct impact on students, teachers and schools, increasing awareness, boosting motivation for students to pursue a career in STEM, and enhancement of creativity. Turning to opportunities for MoEs to give support, he suggested developing clear STEM strategies, building cooperation, focussing on CPD¹⁰ (in-service and pre-service), giving financial support to develop school-industry collaboration and, finally, evaluating those initiatives. He pointed out good practice examples such as the STEM Ambassadors in the UK or Flanders, the TEEN Science Café in Malta¹¹ or the LEKTOR2 Scheme in Norway.¹²

Following Yves Beernaert, **Stephan Griebel**, who is responsible for business development and alliance for Texas instruments' Educational Technology solutions, took the floor. He works for a semi-conductor company with a strong STEM background and many engineers as employees. For him, STEM means creativity. He stated that we should create the foundation for that in schools. Pointing to the "*Teachers Teaching with Technology*"¹³ programme, he raised the questions of how to make tech work in the classroom and what its constraints are. He concluded that STEM is still being taught in isolation from other fields and mentioned the "*TI STEM Labs*" as working on improving STEM teaching. He then foreshadowed that the "*Sharing inspiration 2019*" conference under the topic of "*The power of realisation*" will provide a platform to exchange best classroom practices and take action on them. Towards the end, he dwelt on two Scientix studies – on STEM education policies and on STEM teachers' practices – which found that best results are achieved when teachers work together, break down subject barriers and evaluate what works. In addition, the benefits of a Common Framework for STEM Education and a European STEM strategy were made clear.

Dr Anne-Gret Iturriaga Abarzua, Head of Communications at INEOS Manufacturing Deutschland GmbH, talked about the "*Chemistry for People*" and "*TuWas!*"¹⁴ projects. The latter project, whose name means "*Do something!*", targets 6- to 12-year-old kids. Founded by the Smithsonian Science Education Center, the programme delivers, collects and refills classroom units and trains primary and secondary school teachers on them.

⁹ Professionals Go Back to School

¹⁰ Continuous Professional Development

¹¹ <http://sciencecentremalta.net/teen-science-cafe/>

¹² <https://www.lektor2.no/>

¹³ <https://www.t3europe.eu/>

¹⁴ www.tuwas-deutschland.de/start.html

Chief Officer for Strategy and Corporate Services at Transport Malta, **Jeanette Axisa**, raised the question whether STEM professionals are the teachers of tomorrow and explained that Transport Malta strives to get into schools in a more formal way, as the transport sector urgently needs people for a lot of high-level jobs as well as technical support. She clarified that transport is not only a high-end opportunity for professionals but also for supportive employers. Jeannette Axisa then suggested that the STEM community could provide virtual teaching methods for teaching professionals. She summed up saying that the main challenge is the comprehensive inclusion of stakeholders.

Ana Albalat, Deputy Director General of Research and Digital Culture at the *Generalitat de Catalunya*, presented her views on the contextualisation of STEM education in Europe. Showing related data, she noted that while there are more women in STEM studies, there are fewer in STEM jobs. Still there is an evident lack of a STEM-skilled labour force. That is why specific actions are needed to get more women in STEM. She proposed actions to influence vocations and laid out what the Catalan MoE is doing. As the Ministry has found, STEAM is not very well known among teachers. To tackle this issue, the Catalan MoE has launched a programme of pedagogical innovations and created a new curriculum, in which STEM and Arts are working together.

The audience agreed on the need for a Common European Framework for STEM education. While some participants argued teachers should be in the driving seat, others countered that cooperation should take place between schools and industry, not teachers and industry, in order to break down barriers and support the whole-school approach.

Session 2: Exploring future scenarios for STEM skills

Ana Isabel Montenegro-Garcia works as a chemical engineer at Repsol and is Chair of the Young EPCA Think Tank (YETT). She pleaded for a reinforcement of connections and collaboration between industry and the education world. She gave the example of the YETT, under which online chats and webinars are organised with the support of *STEM Alliance*. She highlighted that the moment when pupils decide whether or not to go into STEM is when they enter upper secondary school. That is why a focus on this age group is crucial. At the same time, she made clear that in order to educate, you have to enjoy the work.

Vladimíra Pavlicová, from the Centre for International Cooperation in Education in the Czech Republic and member of the MoE STEM Working Group, reported that STEM secondary school teachers were invited to the office of CA Technologies. This teacher placement gave insights into IT jobs and what an everyday job in the STEM field looks like. She pointed out that it is not only about a technical background, but also about transversal skills, such as collaboration. She underscored that participating teachers learned that it is these skills that students will need in their future jobs and that these should be integrated in teaching practices.

Teacher Engagement Manager at the Microsoft Headquarters for Central and Eastern Europe, **Olga Svyrydenko**, explained that Microsoft encourages MoEs to run projects within Microsoft's "Education Transformation Framework". Georgia, Hungary and Malta will participate in an internship programme that lasts up to 24 months. She noted that it is much harder to change the attitudes of in-service teachers and that this process takes even longer. The main approach for the internship programme to be a success is to make clear that STEM and IT are part of every subject. Finally, she said that interaction in this programme takes much effort from both MoEs and industry.

Gareth Cullen, Talent Acquisition Manager for Dell in Ireland, observed that in market analysis and selection methodologies, candidates are “measured” on the potential they will have when they graduate and come directly to the company with “zero experience”. While hard skills are the “ticket” to entry, it is actually soft skills that matter for the future. For him, this is the core in order to go forward and this is where the real value lies. He also asserted that there are two main pillars in whatever role you take, namely positivity and optimism, as people should care and want to make an impact.

Chief Technology Officer at IBM Spain, **Elisa Martin Garijo**, told the participants that it is truly her passion to work for STEM. She posed the question of how we are able to track and anticipate changes that are happening so quickly and mentioned the *IBM Skills Academy*,¹⁵ which offers courses to help to train others. The Skills Academy is a contribution to managing the talent chain and supporting people on the path of learning, starting from school to university and finally to their career in industry. She underscored that it is important to make a connection across these institutions and to enhance collaboration of all actors in the ecosystem.

Contributions from the audience revolved around more openness to dialogue and the empowerment of teachers. Moreover, MoEs were invited to pay visits to industry in order to help define the careers of the future.

Session 3: Strengthening the STEM community

After **Dr Agueda Gras**, Scientix Project Manager and Science Programme Manager at European Schoolnet, had introduced the topic to the participants, **Miguel Silvestre**, Executive Director of Óbidos Technological Park in Portugal, took the floor and introduced a number of successful projects, such as the “*Sumo Fight*” with robots or “*My Machine*”,¹⁶ in which children invent imaginary machines and so get to access what they can usually not access in a regular school setting. These projects constitute new forms of cooperation with industries, but Mr Silvestre also underscored that we should make it the as simple as possible to make technology and science accessible to children, so that they understand, for example, e.g. how robots work. Beyond projects with children, Óbidos Technological Park also works with elderly people and seniors who have never used a computer.

Dr Marko Krstić from the Centre for the Promotion of Science¹⁷ in Serbia followed with a similar approach, stating that the idea of his centre is to make science approachable everywhere in the country. Its work is based on four main pillars, namely, international cooperation, programme activities, academic cooperation, and publishing and media. He explained that the MoE in Belgrade is currently redesigning the national curriculum to integrate STEM into the Serbian education system. He described how technology will be implemented in 16 science parks, similar to those in Portugal that the preceding speaker had presented. The activities of these parks are then coordinated with the school curriculum, so that they complement the exact same modules dealt with in classes. At this point, he mentioned that Serbia is among the first countries to participate in the STEM School Label initiative coordinated by European Schoolnet. At the same time, he noted that there is close cooperation with industry and academia when designing and making models for workshops. One example of this cooperation is the *Makers Space*, which is equipped among other things with 3D cameras and printers as well as lasers. Together with industry representatives, the centre offers guided workshops targeted at young children. Mr Krstić concluded by describing the May Month of

¹⁵ <https://www-03.ibm.com/services/weblectures/meap/>

¹⁶ <http://mymachine-global.org/>

¹⁷ <https://www.cpn.rs/o-centru/>

Mathematics, which aims to encourage more young people to enrol in and study maths at university. Overall, it became clear that it is crucial to develop and encourage a school strategy in STEM education. The *STEM School Label*, which was mentioned by the speaker, is an example of how to engage schools at the level of their senior management to support attractive STEM school strategies and support STEM teachers in their innovative STEM teaching practices.

Giving an overview of Luxembourg's STEM Education Strategy, **Sid Mysore** from the Department of Coordination of Educational and Technological Research and Innovations of the Ministry of Education in Luxembourg explained that the main elements are innovation, initiatives, curriculum, didactic material, school development, monitoring and quality assurance of implementation. The main objective of this strategy is to boost the labour force in STEM-related jobs. Mr Mysore conceded that only a few hours are dedicated to STEM, particularly maths, in the Luxembourgish education system and that these hours thus need to be used effectively. He then argued that innovative educational programmes require innovative environments. That is why the MoE in Luxembourg supports mobile and flexible workspaces in schools and acknowledges that it is necessary to adapt them to different school profiles. He emphasised the importance of bringing together like-minded schools and teachers both within, among and outside of schools. His ministry has therefore launched the *STEM Expert Net* in which experts with certain profiles can be booked by schools in order to share first-hand experience from practice.

Finally, the Head of the Technical College at the Malta College of Arts, Science and Technology, **Mario Cardona**, explained that his college provides various tiers ranging from a "second chance programme", which aims at re-engaging drop-out students in vocational training, to Master's programmes. He made it clear that it is crucial to engage in sustained dialogue with companies, so as to make sure that the programmes offered are not only relevant to students but also to industry. The Technical College has therefore developed integrated apprenticeships and placements with companies. Mr Cardona further described how the different institutes cover a wide array of courses ranging from transport and maritime studies to engineering, applied sciences and ICT. He made it clear that, at present, Malta "cannot keep up with the demands of industry", especially in aviation. That is why he appealed to get secondary students, schools and teachers involved as much as possible.

Round tables

Round Table 1: Making cooperation between Ministries of Education and industry a norm in European education

The session centred on a discussion around best practices from companies and MoEs' initiatives, how to work more efficiently on common projects in future, and what is lacking to put such cooperation into practice. In recent years there had been a clear improvement in collaboration between industry and education, supported by the investment of time and finances from both sides. However, there is still tremendous work to be done, on a European and especially country level, as different countries and even regions within a single country require tailored approaches in view of the various factors that influence the way such programmes can be developed, in particular, interests, demands, lack of financial support, requirements and so on. The question whether a formal agreement on transversal standards and roles for a meaningful cooperation should be developed came up in the discussion.

As **Christel Op de Beeck**, Policy Officer at the Flemish Ministry of Education in Belgium, pointed out, industries could teach teachers through their programmes, but, to make this more efficient and curriculum-related, we need a common European framework and standards of the industry-supported teaching. On top of this, students have to be taught in a broader array of themes – not just STEM – where the same 21st century skills and thus the same standards are needed. Companies can contribute greatly to this aspect. As schools, teachers, and students need to constantly adapt to new conditions in a fast-changing world, industry is the ideal place to learn and experiment with newly emerging technologies.

Ana Albalat, Deputy Director General of Research and Digital Culture at the *Generalitat de Catalunya*, commented that teachers need to know more about what kind of jobs and careers are there presently; not work with stereotypes but with real information. For this, teachers need to go to industries!

Danny Gooris, Senior Manager at Oracle Academy, replying to Ana's comment, pointed out that examples of such types of teachers' professional development exist and it is important for companies to support this in the future. Moreover, he pointed out that in international companies a variety of STEM education programmes are part of Corporate Social Responsibility strategies, and many companies, including Oracle Academy, nowadays offer free solutions for education. To support teachers' development and students' computer skills, Oracle Academy has developed a variety of free training opportunities. But even when they have the needed skills, it is not guaranteed that students will consider entering the IT job market in future. Misconceptions are part of the problem and lead fewer students, especially girls, to choose STEM and IT careers. Thus, to counter misconceptions, real-life role models have to be integrated into education, serving as awareness tools. To support career awareness in computer sciences, there have been thousands of *Professionals Go Back to School*-type visits delivered by Oracle.

One of the examples presented by **Francesca Falco**, CSR Manager at Samsung, showcased Samsung's Corporate Citizenship's theme "*Education for Future Generations*". Samsung has a large portfolio of educational activities varying from the Smart School to the organisation of the Samsung campus, which practically promotes the professional integration of young non-graduates who are passionate about IT by offering free training recognised for the digital professions.

From the perspective of the Head of School of the Agrupamento de Escolas Marinhas do Sal in Portugal, **Carlos Ribeiro**, school-industry projects are efficient instruments in engaging students in STEM and triggering interest in STEM careers, as it is important to start young with raising awareness on the variety of STEM careers. And definitely more parties should be involved in this process, including research institutions, universities and parents.

It is also essential to add career counsellors to the equation to facilitate career awareness in schools and provide students with up-to-date information on STEM jobs. The participants debated the role of career counsellors in the school system, as at the moment this role is put either on teachers or company professionals, or parents or relatives who are STEM professionals, and we can surely do better than that. Despite differences in opinions as to who should play the main role in guiding students and giving them career advice, every participant in the round table agreed that career awareness is ultimately important and has to be integrated into the school system.

In the end, breaking down barriers and starting to work together, commitment and open dialogue are key to bringing the collaboration between MoEs and industry to the next level, and STEM Alliance is the platform that supports both sides in their way to working together on common STEM initiatives in future.

The discussion in this session showed that the two sides (education and industry) cannot work in isolation from each other. Support from government plays an essential role in facilitating such collaboration, and to make a next step in scaling up collaborative initiatives we need a European STEM framework.

Round table 2: How Europe could support the STEM education agenda in all countries

In this session, the discussion started by setting the ground on the support of the STEM education agenda and how this is offered at EC level. **Stefaan Hermans**, Director for Policy Strategy and Evaluation in DG EAC at the European Commission, underlined the EC's work with all 28 member states on raising awareness and carrying out sophisticated and in-depth consultations which are then turned into funding. A good example of a successful awareness initiative is the European Researchers' Night, which takes place in more than 300 cities all over Europe and showcases the diversity of research while highlighting the impact of research on our daily lives.

Karsten Simons, Regional Manager for Corporate Affairs at Cisco, explained the three pillars of the Cisco Networking Academy: the online learning content and courses with industry certification linked to the EU competences framework; the platform providing learning material; and an instructor's qualification – we really want to make sure we have highly-trained qualified instructors. The motivation behind this huge investment is their willingness to create trained professionals able to deploy the technological products in the market. Coming back to the 1st round table's conclusions, Karsten Simons agreed that a European STEM framework will be beneficial for all stakeholders. The understanding of what companies want, what are their motivators, and matching this with the supply of training should be part of the framework.

Gaetano Bugeja, Director for Learning and Assessment Programmes in the Department for Curriculum, Lifelong Learning and Employability at the Ministry for Education and Employment in

Malta, talked about how Malta has started from small and national STEM projects and has gradually evolved to European-level projects. Their partnership and close collaboration with EUN provided their programmes with structure and guidance on their practice. In the next years, Malta is expected to be more involved in STEM teachers' placements/traineeships in industry.

Albert Forn, Director mSchools¹⁸ at GSMA, explained how when GSMA started working on policy issues in relation to mobile technologies, they did not know how to work with the Ministries and had to learn on the way. He also underlined the need for an API explaining what the rules of industry-Ministry of Education collaboration are, what to expect, and some instructions in order to support the curriculum and pedagogy developed by the Ministries. Teachers also have to be reassured when it comes to industry activities implemented in the classroom. Most teachers, although they are interested, will never commit themselves to such activities unless they have clear instructions coming from the Ministries on how and why to work with industry.

Yves Beernaert, Former member of the DG Research Science Education Expert Group and Senior education consultant at Educonsult, insisted on the importance of intermediary bodies like STEM Alliance and the Ministries of Education STEM Working Group in order to support the STEM agenda and efficiently contribute to the framework development to strengthen collaboration between MoEs and industry. Moreover, he underlined the need for evaluation to be made compulsory for all KA3 projects but also to be part of the European STEM Framework. He also explained the importance of addressing pre-service teachers but also involving other actors, e.g. retirees, parents.

The discussion in this session showed that although various efforts are taking place at both industry and policy level to support STEM national agendas, it is critical to work on a European STEM framework that will sustain all existing efforts and provide guidance to industry, MoEs and schools. The role of additional actors like pre-service teachers and parents needs to be considered, while addressing younger students (primary education) is also important.

¹⁸ <https://mschools.mobileworldcapital.com/>

Closing remarks

Stefaan Hermans, Director for Policy Strategy and Evaluation in DG EAC at the European Commission, reiterated that he was privileged to be able to listen and talk at the High-Level Event 2019. He insisted that what we are doing in training and education today is a question of utmost relevance and he was glad to witness the courage to engage in this discussion, having everyone at the table. He encouraged the audience to step out of the small paradigms that each of us work in and to pay closer attention to the bigger picture. With regard to employment prospects and the labour market, his guiding question was how to match profiles and fill the needed positions in industry. He suggested there is an ever-growing need for higher input and skills as well as a well-founded background in STEM, as “this is what our society and economy are expecting”. He then turned to students and the need to take into account how they act and interact. He emphasised the role of the teacher and school principals and admitted that it is quite a challenge to answer the question of how to motivate young people and make them passionate about these topics. Their interaction with one another as well as mutual understanding are very important elements, especially for the relations between industries and schools. He observed that often, when industries voice the need to adapt the curriculum, schools say it not their business. He then noted that it is crucial to guide young people to “step out of their circle”, that is, parents, friends etc., in order to introduce to them effectively what is out there. As a major issue, Mr Hermans identified the gender gap, which, according to him, is due to the flow of the educational system. He stressed that education alone cannot solve this but that it is also up to the labour market. He also diagnosed that within the discussion on the future of Europe, there is not a single issue to which education (as well as science and research) is not a solution. In line with the annual European semester, 20 out of 28 member states received country-specific feedback on the need to improve their education system. And yet, education is still not a European competence. The next EU multiannual financial framework aims at boosting the European education area and about 700 million € will be dedicated to the digital within the Erasmus programme and other funding schemes. Finally, mentioning “investEU”, the follow-up programme of the “Juncker Plan”, he concluded that it still EU money coming from structural and cohesion funds that gives the impetus for further movements, even in the richest countries of the EU.

Closing the High-Level Event 2019, **Marc Durando**, Executive Director of European Schoolnet, summarised the outcomes of the conference and painted a picture of the current state of play of STEM in Europe. He explained to the audience that “what we are good at in Europe is diagnosis. What we are not so good at is to take action and evaluate these actions.” He analysed the key issues of STEM education in Europe, namely technology transformation, PISA performance, low attractiveness of STEM studies and careers as well as the conservatism of STEM teachers in their teaching practices and a lack of innovative teaching approaches. At the same time, he acknowledged that a lot of countries are engaged in STEM national strategies that involve, among other things, curriculum reforms, company-school partnerships, science centres or CPD for teachers. There are, however, only a very few initiatives supporting career advisors and there is not that much exchange at European level between countries. These issues could be tackled, respectively, by strengthening high-quality career advice in schools and the dialogue initiated within the EUN MoE STEM Education Working Group. Giving an overview of the outcomes of the High-Level Event 2019, Mr Durando named the need for capacity building of teachers and the focus on STEM school strategies, and concluded that cooperation with industry should become the norm. To enhance the attractiveness of STEM studies, he suggested three interrelated factors, namely motivated and recognised teachers; innovative pedagogy and creative curricula; and the role and engagement of industry.

Organisers of the STEM High-Level Event 2019



About STEM Alliance

The STEM Alliance (<http://www.stemalliance.eu/>) brings together industries, Ministries of Education and education stakeholders to promote Science, Technology, Engineering and Mathematics education and careers to young Europeans and address anticipated skills gaps within the European Union. The STEM Alliance builds on the success of the EU-funded inGenious initiative (2011-2014) to increase the links between STEM education and careers, by involving schools throughout Europe.



About SYSTEMIC

SYSTEMIC is a strategic partnership project funded under KA2 of the Erasmus+ programme. The overall objective of the SYSTEMIC project (“Say Yes to STEM In the Classroom”) is to increase young Europeans’ interest in mathematics, science, engineering and technology education and careers and to provide teachers with the appropriate pedagogical tools to teach STEM topics differently and in a more attractive way.



SYSTEMIC is Co-funded by the Erasmus+ Programme of the European Union (Grant Agreement N. 2016-1-BE02-KA201-017360). The content of the document is the sole responsibility of the organiser and it does not represent the opinion of the European Commission (EC), and the EC is not responsible for any use that might be made of information contained.



About Scientix

Scientix (<http://scientix.eu>), the Community for Science Education in Europe, promotes and supports a Europe-wide collaboration among STEM (science, technology, engineering and maths) teachers, education researchers, policymakers and other STEM education professionals. Scientix has been running since 2010, organising teacher-training activities, dissemination conferences and events, and supporting the exchange of knowledge and experiences in STEM education via its portal, publications and events.



The work presented in this document is supported by the European Commission's H2020 programme – project **Scientix 3** (Grant agreement N. 730009), coordinated by European Schoolnet (EUN). The content of the document is the sole responsibility of the organiser and it does not represent the opinion of the European Commission (EC), and the EC is not responsible for any use that might be made of information contained.

This event was organised with special support from:



Transport Malta



MINISTRY FOR EDUCATION AND EMPLOYMENT

