



FOR FUTURE

Project Result 1 – Format for STEM Camp
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Over the past twenty years, there has been a widening gap between supply and demand in STEM (science, technology, engineering and mathematics) subjects in Europe. While a large number of people complete their studies in subjects with little demand from companies, there are some sectors, particularly those related to STEM subjects where there is an excess of supply over demand. This leads to a number of problems: those who cannot find a job in their own sector tend to enter jobs that require even lower qualifications or move to occupations in completely different fields, also leading to a wage mismatch.

It therefore becomes crucial to work on matching the job requirements and skills of young people: the educational and training choices one makes throughout one's life can increase the possibility of finding future employment and/or an occupation aligned with one's expectations. The mismatch between what is studied and the available jobs has negative impacts on several fronts: on the individual person, in terms of earnings and satisfaction/motivation; on individual companies, which are unable to find workers with appropriate skills, thus decreasing their competitiveness; on the entire community, because such a mismatch shows a low return on what has been invested by the public sector in education, generates low productive growth and a possible increase in unemployment, tending to hold back growth and development in the economic environment.

Far from channelling all students into already structured educational paths, which do not leave them the opportunity to develop their skills, talents, passions, it is necessary to structure educational interventions with an orientation character so that students can more easily understand how the labour market is structured and what future possibilities they may have, also providing data with respect to the prospects of accessible jobs in the future. This lack of information has an impact on all students; more so on those who have fewer opportunities to gather information about the labour market within the family environment in which they live. Another particular group particularly affected by this difficulty in orientation towards STEM subjects are female students, who are often still subject to prejudices that deem women to be unsuited to STEM subjects. Moreover, female students themselves struggle to find female role models to follow in this path of approach and discovery. This implies that although at a very young age boys and girls show similar levels of interest in STEM disciplines, few girls maintain and pursue it in academia and careers.

Developing meaningful skills for digital transformation is vital for Europe to fully exploit the benefits of the digital revolution and remain competitive in the global marketplace. While almost all professions in the future will require digital skills, data provided by the European Commission show us that 40% of EU workers have few or no digital skills. This will lead to a definite mismatch between supply and demand considering that it is expected that by 2030 there will be more than 50 million jobs available worldwide for positions requiring STEM skills. This is a priority across Europe. Possible solutions to improve the current situation include initiatives to enable young people to acquire the required skills and competences, while also developing non-formal methods of teaching



them, which also enable them to develop a critical understanding of the world and to actively participate in the growth of the economy. Acquiring skills in these fields enables students to develop critical thinking, solve problems in innovative ways and prepare them for the constantly changing world of work.

It is therefore essential to build tools and pathways to guide students to make informed decisions, giving them on the one hand an overview of the world of work, with a future perspective on possible jobs. On the other hand, it is necessary to allow them to try their hand at certain subjects, in places that are non-judgmental and open to error, so that they do not feel judged or under close observation.

The implementation of a STEM programme for students who have not yet embarked on university or career paths is particularly important, as at this time in their lives students are making important decisions for their future. Students who have access to a STEM programme during this period are more likely to choose a career in these fields and have more job and career opportunities in the future. Participation in this type of pathway enables them to develop skills and knowledge that will be useful throughout their lives and in all areas of work.

The use of practice/laboratory/project work tools within the didactics, such as the STEM field, can bring several benefits: on the one hand, it allows a direct involvement of teachers of both technical and non-technical subjects, with a view to interdisciplinarity in the orientation phases of students. On the other hand, the opportunity to put the knowledge acquired in the classroom into practice allows students to better grasp the fields of action, recognising their practicality on the one hand and increasing their confidence, particularly by dismantling gender stereotypes.

It is interesting, in this type of training/guidance activity, to try to build relationships with companies in the construction phases of the activities, in order to orient to the educational/training and professional future with a deeper knowledge of professional dynamics and thus mitigate any biases and prejudices that may exist around STEM professions. In this sense, the relationship with companies can allow the stories of women in this field to be represented and shared, leading female students to recognise themselves and build an image of their own future.

The following is a model for the implementation of camps for the introduction to STEM subjects and choice orientation for students on this type of pathway at university/post-graduate/career level.

The model is aimed at teachers and trainers who intend to implement introductory camps in STEM subjects: a methodological format of a formative-oriented nature has been defined, useful for the construction of activities capable of effectively conveying the





essential concepts of these subjects, with a focus on their importance in multiple application contexts, including possible future occupations.

The aim of the camps is to

- update students' knowledge and gain awareness of the opportunities and skills required by innovation processes;
- approach STEM disciplines in an original and experiential way, stimulating the construction of their own educational pathway and counteracting gender stereotypes.

The proposed format refers to orientation methodologies that support professional choices, counteracting the gender stereotypes that characterise STEM sectors and showing the characteristics of the production system of the countries involved, also through testimonies of professionals working in technical-scientific sectors. The activities are intended to constitute the framework of an integrated system between institutions/schools and territory for the promotion of technical-scientific culture and equal opportunities, which will be implemented also through the involvement of teachers and trainers.

The following points are intended to guide the teacher and trainer in focusing on the necessary points, the essential steps, for the realisation of a STEM Camp. No compulsory steps will be provided, since a STEM camp has to respond to different needs and will have different specific objectives related to the peculiarities of the country in which it takes place. However, some steps are essential for a successful implementation of the camp.

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Definition of objectives and content

Setting up a summer camp in the STEM field for students aged 16 to 20 requires careful planning. First of all, it is important to define the objectives and content of the camp in order to develop an engaging and stimulating programme for the participants.

The objectives of the summer camp should be clearly defined, realistic and targeted to meet the needs of the participating students. This could include defining the goal of providing participants with a deeper understanding of the basic principles of science, technology, engineering and mathematics, as well as providing them with the opportunity to apply these principles in a practical manner.

It is also important to consider the age and needs of the participants when defining the objectives of the summer camp. Students between the ages of 16 and 20 may have different needs than younger or older students, so it is important to tailor the programme to meet their specific needs.

Once the objectives have been defined, it is important to develop stimulating and engaging content for the summer camp. This could include theoretical lectures on the basic principles of STEM sciences, hands-on workshops to apply these principles, visits to local businesses and industries employing STEM skills, as well as networking and soft skills development activities.

It would also be important to involve students in defining the content of the summer camp. Asking them for their opinions and needs can help create a more engaging and stimulating programme for them, as well as improve their overall experience.

This phase includes the analysis of the reference territorial context, with particular attention to the labour market, to the mis-match of supply and demand, to the territorial vocation and to the school paths already present in the reference territory.

The definition of specific objectives referring to the general objectives of this type of activity is foreseen:

- Approach to STEM disciplines
- Orientation to future educational and professional choices
- Countering gender stereotypes
- Promotion of technical-scientific culture in the territory

The STEM campus should be based, for example, on the territorial vocation or the mismatch of supply and demand.

Evaluate whether it might be interesting and useful to get in touch with some companies interested in collaborating in the implementation of the camp.

Articulation of activities (priorities and sequencing)

The articulation of activities and the definition of their sequencing are key elements for the success of any project, including a STEM camp. In order to achieve the goals of the summer camp, it is necessary to divide the goals into specific activities and to define the sequence in which these activities will be carried out.

Breaking down the objectives into specific activities helps the structure of the entire camp and aids the possibility of checking whether the set objectives can actually be achieved. For example, if the objective of the camp is to provide participants with a deeper understanding of the basic principles of STEM sciences, activities could include theoretical lectures, hands-on workshops and visits to local businesses and industries employing STEM skills.

Once the activities have been defined, it is important to prioritise to ensure that the activities considered preparatory are carried out first, thus avoiding leaving gaps in knowledge necessary for the activity to run smoothly. For example, if the objective of the summer camp is to create an intelligent greenhouse, it is necessary, among the first steps, to define which plants will be placed in the greenhouse and what characteristics and water and light requirements they have. It is also important to establish the sequence of activities: while some activities can be carried out simultaneously, others must be planned in sequence.

Being a camp, one imagines their involvement for several hours over several days: an important element to bear in mind is to imagine moments of leisure and sharing with the other students during the activity. It is necessary to prevent the students from feeling overwhelmed by the workload: although the camp's characteristic is that it is an orientation camp, it must nevertheless be a place where the students can serenely experience what they are doing, so that learning and orientation becomes an enjoyable activity and does not demoralise them.

In summary, this part of the camp involves planning, not detailing, the training aspects, thus creating an overall picture.

At the end of this phase it is necessary to have an adequate response to several answers, including:

- How many days does the camp last?
- How many hours per day are foreseen?
- What days of the week are planned?
- Is it a residential camp or another type of camp?

It is also necessary to ask what percentage of the camp time will be devoted to soft skills and what percentage to technical skills, all considering the specific objectives set out in

the previous point. It must also be defined how much of the camp will be theoretical and how much practical.

A framework defined in this way will allow the activity to be presented in an organic way to possible project participants.

Analysis teaching methods

Making sure to use effective and engaging teaching methodologies is crucial to the success of a STEM summer camp. In order to define which methodologies are the most suitable, the following questions need to be answered:

- What are the objectives of the summer camp and how can they be achieved through the use of different teaching methodologies?
- What are the needs of the summer camp participants and how can they be met through the use of different teaching methodologies?
- Which teaching methodologies are best suited to the knowledge and skill level of the summer camp participants?
- How can digital technologies be used to enhance the learning experience of summer camp participants?
- How can group work and collaboration be incorporated into the teaching methodology of the summer camp?
- How can practical examples and case studies be used to enhance the learning experience of summer camp participants?
- How can educational games and playful activities be used to enhance the learning of summer camp participants?
- How can practical experience and workshop activities be used to enhance the learning of summer camp participants?
- How can team building and friendly competition be used to enhance the learning of summer camp participants?

The analysis of possible teaching methodologies requires a careful assessment of the summer camp participants, their needs and level of knowledge and skills. It is often the combination of different methodologies that is the key to be used in the implementation of the camp. The following are some examples of those that could be used:

- Lectures: the best known and most widely used teaching methodology involving a teacher or expert delivering information or concepts in a systematic and structured way to the participants of the activity. Lectures can be used to provide a basic overview of a topic or to go into specific notions in greater depth.
- Practical activities: hands-on learning involves summer camp participants participating in practical and experimental activities. This may include workshops, experiments, simulations or prototyping activities. Practical activity helps

participants better understand concepts and applications in a concrete and direct way.

- Group work and collaboration: group work and collaboration are teaching methods that involve the active participation of summer camp participants. Participants can work together to solve problems, create projects or carry out activities. This methodology encourages active participation and the sharing of ideas and knowledge.
- Project-based learning: This methodology involves summer camp participants working on specific projects during the summer camp. Participants can work in groups or individually to develop a project that is in line with the objectives of the summer camp. This methodology encourages active learning and participation by the participants.
- Gaming: The use of educational games is an educational methodology that can be used to engage summer camp participants and support learning. Educational games can be developed to teach specific concepts, such as programming or physics, or to develop soft skills, such as problem solving or collaboration.
- Video-based teaching methods: the use of educational videos is a teaching methodology that can be used to provide information and demonstrations on a specific topic. Videos can be used to provide a general overview of a topic or to delve into specific notions.
- Quiz-based learning activities: the use of quizzes and tests can be an effective teaching methodology to test the learning of summer camp participants. Quizzes can be used as a review activity or as a tool to assess participants' learning.

To these can be added other methodologies that can, for example, also make use of innovative and technological tools: the use of virtual reality (VR) and augmented reality (AR) provides STEM summer camp participants with an immersive and engaging experience, allowing them to interact with virtual objects and environments in a realistic way (e.g., for an astronomy summer camp, VR can be used to explore the solar system). It is also possible to base learning on research, during which students can carry out small research activities, learning how to collect, analyse and read data, understanding concepts better through direct experience. Another methodology is simulation-based learning: a specific environment or situation can be reproduced to teach participants how to respond and act in certain situations. A final example is gamification-based learning, which involves the use of playful elements combined with scores, levels and rewards, to motivate participants and make learning more engaging and stimulating.

In choosing the most suitable methodology, it is important to identify and combine teaching methodologies in a strategic manner, so as to meet the objectives of the summer camp and the needs of the participants. In addition, it is important to evaluate the effectiveness of the methodologies used during the summer camp and make any modifications to enhance the learning experience of the participants.

In order to define the most suitable methodologies, certain elements are necessary:

1. What are the aims of the STEM summer camp, as a teaching methodology might be more suitable to achieve the aim;
2. The needs of the participants: the teaching methodology chosen should be adapted to the needs of the participants, such as knowledge and skill level, individual preferences and educational needs;
3. The availability of resources, such as budget, personnel involved and equipment;
4. The innovation of methodology and the involvement of participants.

It is necessary to start evaluating possible training models that could be used to support both the guidance process and the approach to STEM subjects.

Definition of the characteristics of the group

Before implementing a STEM summer camp, it is important to define the characteristics of the group that will be involved:

- What is the age of the participants?
- What is the knowledge and skill level of the participants?
- What is the educational background of the participants of the STEM summer camp?
- What is the level of interest of the participants in STEM subjects?
- What is the group size of the STEM summer camp participants?
- What is the composition of the group of STEM summer camp participants? For example: only girls? Boys and girls? Students of different ages or students with special educational needs. Understanding the composition of the group can help tailor the learning experience to meet the specific needs of the group.

The number of participants must take into account a balanced ratio of participants to teachers.

Promotion of the initiative

It is necessary to define to which participants the activity will be open:

- are they already pre-defined students/young people?
- Is it necessary to build an ad hoc communication and promotion?
- Is it necessary to involve external educational institutions that need time and tools to collect registrations?

If promotion is necessary, it is important to define the correct channels to be used and to evaluate, also in relation to the next steps, any economic resources that can be used.

Finally, if promotion is necessary, consider the time needed for the information to be received and for interest in the initiative to be generated.

The promotion, whether direct or aimed at finding participants from outside their own organisations, should highlight

- objectives of the activity
- the outline programme
- coverage of expenses and possible contributions from participants
- the application procedures

The selection criteria and any exclusion criteria should also be highlighted.

Promotion, an essential step in gathering support, can be carried out through various channels:

- Advertising through social media, an effective marketing channel to reach a wide range of students. Social platforms such as Facebook, Instagram, Twitter, TikTok and LinkedIn can be used to publicise the STEM summer camp, create an event or page dedicated to the initiative and share photos and videos of past activities.
- Sending e-mails to students as well as teachers and parents can be an effective way to promote the STEM summer camp. From the experience of the project partners, emails require a follow-up effort, with subsequent contact by phone or again by email.
- Collaboration with schools, which can be an important ally in promoting the activity: they can send information to students' families via e-mail or letters, post announcements on the school's website or share information with students during lessons.
- Organise promotional events to create interest and encourage enrolment, in cooperation with schools, libraries or other public bodies.

Participants selection

The selection of participants is a crucial step in the implementation of the activity. Selecting the right participants can make the difference between a stimulating and engaging learning experience and one that does not meet participants' expectations. In this chapter, we will discuss the criteria for selecting participants, how they are selected and some other considerations that must be taken into account during the selection process. It is essential, when collecting application and then during the selection phase, to make clear, in a transparent manner, what the selection criteria are for participating in the camp

Defining the criteria for selecting participants is an important step in the selection process. The selection criteria should be defined according to the objectives of the activities: if, for example, the objective of the STEM summer camp is to encourage students' interest in science, it might be interesting to select students who do not have the opportunity to approach science subjects within their school career. Similarly, if the aim of the STEM summer camp is to provide an advanced learning experience in a particular STEM field, it may be necessary to select participants with advanced knowledge and skills in that field. In the direct experience of the STEM for future project, it is not school merit that is the most important element for participating in a STEM

orientation. Often in these more informal occasions, the learners who seem to have more difficulties at school show more proactivity and willingness to learn and collaborate with others. Modalità di selezione dei partecipanti

There are different ways of selecting participants. Whether the selection process is internal or external to one's own reality, it is necessary to consider different selection tools and understand which is the most functional. There are several tools available. Here are a few, by way of example:

- Admission questions, with questions to gather information about their previous experience in STEM, their motivation to participate and their learning objectives.
- STEM knowledge and skills tests, to assess applicants' competences in a given STEM field. These tests can be administered online or in-person. They are particularly useful if one wants to be sure that participants already have some prior knowledge. They prove to be non-functional in the case of guidance activities for people with no experience in the STEM field.
- Interviews, used to assess the motivation and interest of candidates, can be conducted in person or via video conference.
- Psychological assessments, to assess candidates' personal characteristics such as motivation, personality and social skills.
- Group assessments to assess candidates' social and cooperation skills already at the selection stage. These exercises may include team building activities, problem solving exercises or role-playing. Uninteresting in the case of guidance activities that want to involve young students, who are probably unaccustomed to working in groups but who may benefit from the STEM field to improve these skills as well.

A special note on the subject of motivation: this is indeed an important factor, which must be assessed especially when the activity will take place long after the selection.

From the point of view of the management of this point of camp implementation, three other elements must be taken into account:

- the internal resources that will be involved
- the most appropriate selection process
- the tools needed for the selection process

Once the participants have been selected, they will receive an email/call and will be called to sign the STEM Summer Camp Participation Agreement, which must include the terms and conditions of participation in the summer camp. It should also include information on activities, obligations of the participant and the organisation/school, informed consent and logistics, as well as contact details.

Detailed design and resources

Detailed planning is a key step and is only possible once one has a clear understanding of the learning objectives, activities and resources needed for the camp. The objectives, already defined at the beginning of the activity design (which must be measurable, attainable, relevant and defined) should already be divided into activities that must be engaging and stimulating, such as hands-on projects, presentations, team collaboration and visits to companies and workshops. At this point it is necessary to go into detail for each activity on the time required, the resources and equipment, the personnel involved and the expected results. This must be accompanied by an evaluation method for each activity: although this may seem redundant compared to the general evaluation of the entire activity, it allows the progress and actual achievement of the objectives to be monitored in a timely way. It also makes it possible to evaluate possible corrective actions in the event of criticalities.

The detailed planning also makes it possible to verify what was assessed in the planning phase, including the actual sequentiality and logic of the activity, which thus follows a coherent order, enabling all participants to actually achieve the expected and necessary competences. In this phase, it is also possible to prepare any teaching materials that will support the students during the activity but also before or in the self-study moments, which could help to fix any themes that have been addressed during the activity.

No less important, in addition to STEM skills, are soft and transversal skills: for these, too, it will be necessary to plan the activities in advance, so that they are an important element in creating a serene and welcoming learning environment for all participants.

A further point in the detailed planning, which is extremely important but also interesting in order for the activity to have a real impact in the future, is the involvement of companies, moving from sponsorship to collaborations. Going into detail, in the case of sponsorship, companies can be involved with the provision of material resources such as equipment, tools, teaching materials or other. In turn, the company can gain visibility and recognition as a sponsor of the camp. For collaborations, companies can be involved by asking to give testimonials or guided tours in their realities. In this case, companies act as inspirers for the young students, enabling them to better understand the labour market and the STEM sector. Another interesting way to involve companies could be mentoring during the stem camp. Involving them as mentors/experts in the sector means accompanying the participants in their daily work, providing them with advice and support.

The involvement of companies is a very interesting element, but not always easy to implement: it is indeed important to involve them by developing a collaboration plan, not necessarily formal, that is beneficial both for the camp participants and for the company itself. It is necessary to be transparent and clearly communicate the benefits of the event for all parties involved. The company can also be involved to launch a challenge/project

to accompany participants throughout the camp (in the case of a challenged/project based activity). In this case, it should be borne in mind that not all companies are clear about how their activity can be translated into an orientation course for young students. Teachers and trainers will therefore have to intervene to help them identify interesting points that can be carried over into the camp.

At this point, it is possible to proceed with the definition of the detailed calendar: the calendar should include the start and end dates of the STEM summer camp, daily activities, breaks, etc. From experience within the STEM for future project, it is interesting to provide such a calendar to the participants, almost like a working agenda. On the one hand, this allows greater transparency of everything that will be done, but it also fosters a sense of responsibility on the part of the participants. They are not passively involved in the activities, but they know the structure in detail, they can actively identify ways of meeting deadlines knowing that not all days can be devoted entirely to the project they are working on, etc.

A further step to be taken at this point in the organisation of the activity is the identification of resources. This term refers to everything that can support the camp's activities and objectives. They can therefore be of different types:

- Human resources, trainers, teachers, mentors, tutors, etc;
- Material resources, e.g. computers, 3D printers, robotics, laboratory equipment, teaching materials, etc.; 2;
- Financial resources, i.e. what budget allows for covering direct/indirect and internal/external costs of the camp.

When the resource element is included towards the end of the planning phase, close to the start of the activity, it is important that the planned activities, identified objectives, etc. actually fit the available resource capacities. For instance, it would be too costly in organisational terms to design a camp for augmented reality if one does not have the tools or trainers available to deliver this activity.

One particular note concerns the ratio between the number of participants and the number of teachers/trainers involved. The number depends on several factors, such as the planned activities and the level of support required by the activities. It would be appropriate to have 1 teacher for every 10 participants, approximately, but this also depends on the type of specific needs that each participant requires (e.g. BES, learning difficulties, etc.).

Another element to take into account is the possible use of tools or the complexity of the proposed programmes, which increase the number of teachers/trainers per participant.

A final note for human resources: it is important to be able to involve purely STEM teachers, who have in-depth knowledge of the subject and teaching skills, in the activities, but also non-STEM teachers. On the one hand, this allows a multidisciplinary

approach, integrating the more technical scientific subjects with the social sciences, the arts and the humanities, making the application plan of technical concepts and skills more creative. Interdisciplinarity can also foster and encourage the creation of more innovative solutions and develop new ideas, which are often not conceivable and possible in a purely technical and scientific approach. Non-STEM teachers, moreover, can put the focus on many other aspects, related more to transversal and soft skills, such as communication, problem solving, public speaking, problem solving within teams. Such an approach can also foster diversity and inclusion: the presence of non-STEM teachers can help promote a different model of learning, thus encouraging access to more technical and scientific subjects for all participants, regardless of their background. It will be possible to show the possible interactions between STEM and non-STEM worlds, facilitating the understanding of how technical skills are now pervasive in all sectors and not necessarily linked to a distant and different world.

It is part of the detailed design phase to define the services related to any residential camp. Key services are accommodation, meals, security, possible evening activities and transport to the training site. All of this information must be included in the agreement that will be provided and signed by the participants when they are selected for the programme, discussed in the previous section.

Introduction of the camp and start of activities

The introduction to the STEM camp and the start of the activities are crucial moments to ensure the success of the programme and the satisfaction of the participants. Upon arrival at the camp location, students should be welcomed by the programme staff and given a formal welcome. The camp programme, objectives, rules of participation, etc. should be presented. At this stage, it is important to create a welcoming and trusting atmosphere that puts participants at ease and prepares them to learn and collaborate. To help familiarise students with the camp site and the activities planned, it is advisable to organise a staff-led orientation activity to get acquainted with the camp's facilities and resources, and to interact with other participants.

After the orientation activity, it will be possible to enter into the details of the activities, starting with the icebreaker activity. This first activity will help students break the ice and create an atmosphere of cooperation and trust: they will get to know the other participants, interact with them and develop greater group cohesion. After the introduction to the camp and the start of the activities, the STEM camp will begin.

Assessments tool, quality assessment questionnaires and certificates of attendance

Evaluation is a key element in measuring effectiveness and ensuring continuous improvement of activities. Evaluation must be seen as an opportunity to monitor and improve the programme. Evaluation can touch on several points:

- Evaluation of the increase in STEM skills: crucial for measuring effectiveness, evaluation must be based on specific, measurable objectives that reflect the programme's goals. Evaluation can be done through tests, practical activities, observations and other assessment tools. In this way, participating students and teachers will be able to assess their level of knowledge and skills in STEM fields, and monitor their progress throughout the programme. It is important to administer a questionnaire both at the start and at the end of the activity in order to effectively measure the increase in skills. On this subject, we refer to Project result 2 of the STEM for future project.
- Evaluation of satisfaction, which must be based on clear and specific criteria. The tools used must allow students and teachers to express their opinion on the STEM programme, the organisation and the quality of the activities, and to provide useful feedback for improving the programme.
- Evaluation of the impact: at the end of the activity, the evaluation of the impact on the participants' orientation towards the choice of the post-diploma training/occupational pathway is recommended: therefore, it is foreseen the use of an additional questionnaire that will be submitted to the participants 6 months after their participation in the camp, in order to investigate their orientation towards professional and/or educational choices, as well as their changes and motivations.

Evaluation is a crucial element in ensuring continuous improvement; it must be seen as an opportunity to identify strengths and weaknesses of the activity and to develop strategies and subsequent actions. Evaluation must be done regularly during the camp, so that timely action can be taken and corrective actions activated.

The certificate of attendance is a document that attests the student's participation: it makes the work done during the camp transparent. It attests to the commitment and work done during the programme and can be used as an asset in job searches or when enrolling in university or vocational training courses. It also attests to the effectiveness of the programme and the value of the activities performed.

Conclusions and recommendations

During the European STEM for future project, the implementation of the camps followed the model presented in this document. As mentioned at the beginning of the document, the implementation has to take into account several characteristics: not always the delivery methods of one country can be shared by other countries, just as often some ideas proposed within a national camp turn out to be interesting good practices to be included in future camps.

With a view to improvement and peer review, a series of verification activities were defined and a real peer review was structured. From what emerged, we report some suggestions and elements to be taken into consideration when implementing the activity.

Peer review

Following the steps indicated in the format, observation grids were created which were filled in by the teachers and trainers involved during the implementation of the camps. For each step in the format, they were asked to indicate the time period, who was involved, the results obtained and any critical issues that arose during implementation.

The experts' peer review was based on the observation grids already compiled: for each project partner country, an expert from outside the project was identified. Once the completed evaluation grids had been read out, each expert gave his or her own assessment of the findings, indicating the strengths and weaknesses of each camp.

The summary of the main points of the peer review include the following conclusions:

1. considering the level of satisfaction and learning that can be gathered from the analyses made during the camp, a very high level of satisfaction is measured, a growth in competences and skills, and the usefulness of having a wide variety of activities within the same camp
2. Favourite activities: most of the students agreed that theoretical activities were the least appreciated and that they much preferred practical, playful, fun and stimulating activities. The experts report this as a point of attention when defining the detailed planning and training methods to be used
3. If it can be organised, a visit to STEM companies would be interesting.
4. It is important to put into practice the skills and learning acquired during the summer camp..
5. Among activities, the most popular are the ones including robotics, IA and programming.
6. Teamwork is a must, and pre-established groups and changing roles is also something positively valued.
7. As for soft skills, Summer Camps have contributed to improve a number of soft skills such as problem-solving, teamwork, communication, creativity, patience, leadership, etc.
8. Participants would like to take part in any way they can in the International Summer Camp design.
9. Although not that popular among students, experts have expressed the importance of including math and science activities.
10. Some interesting proposals by experts include the development of an app to solve a real problem and increase the students 'soft skills, the use of challenge based learning methodologies, the possibility of holding programming and robotics championships, etc.

Interview with Ambassadors

The project included the creation of Ambassadors for each partner country. The role of the Ambassador is to tell and present the project by talking to their peers, promoting

activities that they have experienced directly. They have been involved in the animation of the project's social pages and in events in the classrooms of their schools and educational realities. The ambassadors themselves were also involved in a peer review process of what they had done in their camps. Here are the highlights and the main lessons learnt from them from the interviews conducted.

1. Level of satisfaction and learning: in general, participants are highly satisfied: they consider that they have grown in competency and skills, they also have been creative and they have implemented a project by themselves (self-learning). The usefulness and variety of the activities is also pointed out. Moreover they had fun and at the same time they have reached awareness about the importance of STEM.
2. Aspects of the Summer Camps to be improved or to focus on: ambassadors suggest to include more detailed previous information about the Camp contents for a higher participants' motivation. Also, the theoretical activities were less popular for them, so this must be taken into account for the International Camp. Programming and robotics activities are much preferred to Science ones.
3. If students could organize the International Summer Camp they... a) Would always try to have a balance between hard work and fun. b) Would include the four STEM fields in a practical and user-friendly way. c) Would use the Challenge Based Learning methodology. d) Would focus on Technology (robotics and programming activities). e) Would always work in groups (pre-established groups and changing roles is also something positively valued).
4. After the camps they... a) Have a better understanding of STEM education, its importance, applicability and usefulness for their employability. b) Have understood the connections and interactions between STEM fields to develop a final product.
5. As for soft skills... a) The most used in the Summer Camps were teamwork, creativity, decision-making, problem-solving, leadership, communication and organizational skills. b) Ambassadors recognise their importance in their professional future, in all job positions (someone mentions that they are as important as hard skills in the workplace, and they increase workers' competence). c) In general, Summer Camps have contributed to improve a number of soft skills such as problem-solving, teamwork, communication, creativity, patience, leadership, etc.
6. When asked if acquisition/lack of STEM education will affect their professional life, they unanimously consider that of course they will, therefore having them will boost their employability and vice versa.
7. In relation to gender issues, there are different opinions. Some of them think that there is still a big gender gap, affecting different fields, and there are still prejudices and a lot of work to be done, not only in the workplace, while others are not that concerned about this topic. There are comments pointing out that they hope that this issue will hopefully play a smaller role in the future, and how unfair it is to be valued by your gender and not by your skills.



8. When asked about how to make STEM education more attractive, some interesting remarks are: a) STEM education should be considered not only for smart/nerd students, but for everybody. b) Nobody should be afraid of STEM subjects. c) If STEM education was real life problem based, then more students could see its practical benefits. d) It could be very helpful to show how these areas impact the future, using examples of how they affect people's daily lives. e) Through dissemination in celebrities' social media. f) Through didactic presentations in public schools.
9. Some final remarks: The Italian ambassadors ask for participating in the International Summer Camp design as much as possible; therefore they would be more motivated. They suggest doing it through brainstorming.



FOR FUTURE



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