SCIENCE e-ROBOT

QUALITY CONTROL PLAN

"Science e-Robot"
Integration of Educational Robotics to Scientific Learning Teaching Process

2020-1-TR01-KA201-092601

Erasmus+ Programme
Strategic Partnership Project

DOCUMENT INFORMATION	
Project	Integration of Educational Robotics to Scientific Learning Teaching Process "Science e-Robot" 2020-1-TR01-KA201-092601
Tittle of Output	Quality Control Plan
Motive	Outline quality management and assurance for the project
Dissemination Level	Internal
Abstract	This plan sets out the requirements to ensure the quality of the implementation and results of the Science e-Robot project. It also defines the monitoring and evaluation tools of quality management. Provides quality assurance strategy to project partners throughout the project life.

Status / Version	Date	Author	Description
v0.0 Draft	30.06.2021	Hadiye Kuradacı Science and Art Center	Initial proposal to be discussed and approved by partners
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EXECUTIVE SUMMARY

Producing quality results requires well-structured project management. The purpose of this Quality Control Plan (QCP), created as part of the Science e-Robot project, is to provide all partners with a single point of reference regarding management and quality of results throughout the project. This plan defines the roles, responsibilities, results, progress indicators and other management requirements of consortium members throughout the project.

With this plan, besides facilitating the project management process, monitoring, evaluation and improvement of the project can be achieved. Clarification of this plan, duties and responsibilities, which will serve as a guide and guide for all partners; it also specifies deadlines for project results, communication procedure and indicators of success.

The QCP is a mandatory tool for every consortium member organization and partner organizations project team member to read. It is obligatory to comply with the processes and procedures specified in this plan for the applications and all activities carried out within the scope of the project.

SCIENCE E-ROBOT PROJECT

PROJECT SCOPE AND OUTCOMES OVERIVEW

Introduction

The document presents the Quality Control Plan for Erasmus+ KA201 SCH project 2020-1-TR01-KA201-092601 "Integration of Educational Robotics to Scientific Learning Teaching Process (Science e-Robot) Project".

It has been developed within the scope of the Project's WP 1 (Project Management) in accordance with the Project definition and all applicable rules and guidelines. Quality control is an important part of project management and aims to ensure that the objectives are achieved in the most effective way. This Quality Control Plan (QCP) defines the overall approach to quality control, cross-package evaluation, internal and external evaluation, and the procedures to be followed by partners for effective communication as well as the production and documentation of project outputs. The document outlines the strategy on how to implement quality control mechanisms for comprehensive monitoring and improvement of operational, management and working procedures throughout the project lifecycle.

The QCP includes a set of programmed activities and defines goals, roles and responsibilities. The QCP includes established indicators, methodology and procedures for evaluating project activities and results. For each task, it defines the responsible partners, the time frame and means of implementation, the expected results or products, as well as the relevant quality criteria.

Project Presentation

The EU 2020 Strategy, which supports the development of knowledge-based economy, innovation and new technologies and defines smart growth, also forms the basis of socioeconomic development. This strategy places great emphasis on improving the quality of education and training systems, lifelong learning, and spreading innovation and creativity. Therefore, reading, mathematics and one of the main objectives that it tries to reach until 2020, as well as the goal of "To increase the level of basic skills such as literacy and numeracy, to make mathematics, science and technology attractive and to strengthen language skills should be increased." To reduce the failure in science to below 15%.

While the importance of basic literacy and qualifications, called 21st century skills, is increasing in the changing world, on the other hand, developing economic difficulties and technological developments challenge education and training systems. Therefore, the project "The Future of Education and Skills 2030" initiated by the OECD is aimed at helping countries find the answers to two broad questions:

1- What knowledge, skills, attitudes and values will today's students need to develop and shape their worlds?
2- How can teaching systems effectively develop these knowledge, skills, attitudes and values?

However, findings on a world scale are not very pleasant in terms of countries' education and training systems. When these findings are taken into consideration; According to TIMSS 2015, the 8th grade scores of 20 countries from 39 countries are below the world average. In addition, according to the 2018 PISA results of 79 world countries trying to determine the student's

performance in science and attitude towards science, the proportion of 15-years old students who could not reach a basic proficiency level in science in the EU was 16.6% in 2015; it increased to 20.6% in 2018.

This project, whose focus is on the relationship between core competencies and scientific literacy, is the 21st century core competencies that we call critical thinking, problem solving, creativity, communication and collaboration that determine how individuals approach complex challenges. It is based on the fact that it affects the skills applied to daily events such as reading, arithmetic mathematics and scientific literacy.

In order to increase the level of acquisition of 21st century basic skills, the aim of this project is to increase the quality of education by contributing to the integration of technology into the learning and teaching process; to improve scientific literacy within the consortium by contributing to the development of basic competencies by integrating educational robotics technology into scientific learning and teaching process.

This project has been co-financed by the European Commission, within the Erasmus+ Program, contract Project nº: 2020-1-TR01-KA201-092601

The fields of education that benefits from project activities and outputs are: School Education. The project as a duration of 24 months, starting at 31/12/2020 and ending on 30/12/2022

Goals of the Project

General goal;

In order to increase the level of acquisition of 21st century basic skills, the aim of this Project is to increase the quality of education by contributing to the integration of technology into the learning and teaching process; To improve scientific literacy within the consortium by contributing to the development of basic competencies by integrating educational robotics technology into scientific learning and teaching process.

Our objectives throughout the project:

1- Developing an innovative science learning-teaching strategy compatible with the educational context of the partner countries related to the scientific learning teaching process in which educational robotics is integrated for the target groups by developing 3 intellectual outputs,
2- Increasing the knowledge and skills of 42 staff from partner organizations on different teaching models, measurement and evaluation and robotic methods / techniques in interdisciplinary science teaching,
3- By organizing 5 large-scale multiplier activities and other dissemination activities; Improving the knowledge skills of at least 200 science teachers, 50 teacher candidates and 100 experts on the use of intellectual outputs developed under this partnership,
4- Developing basic competence and scientific literacy of 10-17 age group students through educational robotics,
5- To develop long-term innovative cooperation between partners.

Main Activities of the Project

The project includes;

- 3 transnational project meetings
- 2 short-term staff training
- 5 dissemination activities (multiplier events)

As an innovative trend among the project results, we have 3 important intellectual outputs such as e-workbook open education resource, methodological guide for implementation and comprehensive assessment and evaluation toolset.

Project Intellectual Outputs

We have 3 intellectual outputs within the scope of the project.

Table 1. Outputs of the project

O1	Integration of Educational Robotics into the Scientific Learning Teaching Process Open Education Resource (OER)	It is pedagogically compatible with the target group age levels and triggers the creativity and critical thinking of the student; It can be easily implemented by teachers and students where there are activities that require problem-solving skills to work and enable collaboration; improves the basic competencies of teachers and students, has been adapted to various scientific themes and sub-subject areas in different modern teaching models and has a positive attitude towards science and has learning and teaching scenarios for individuals. E-workbook platform, which provides dynamic, personalized teaching-learning and user convenience, which will influence innovative science activities with robotics content.
O2	Practical Methodological Guidelines for Robotic Assisted Science Teaching	Helps overcome the obstacles to gain students' acquisition of scientific theme and sub-subject areas for the target group age levels determined by the partners; a practical guide to the project partners and in English, describing the application of robotic pattern science activities in various modern teaching models and providing guidance in the use of the open educational resource.
O3	Comprehensive Measurement and Evaluation Toolkit	Testing robotic supported science learning activities; it will provide guidance on assessing their strengths and weaknesses.

Target Groups

In order to achieve maximum outreach and audience involvement, a good identification and selection of the key target groups and stakeholders (to whom the project learnings, results and activities need to be communicated and disseminated) is so crucial.

The project results will be edited to be used by others as widely as possible, so we want to strengthen the qualifications of our target groups by using our intellectual outputs and to raise awareness about innovative science teaching. We will carry out dissemination studies with

various tools in order to influence the practices in science teaching and to offer solutions to the problems encountered, to raise their awareness and to influence their tendencies.

The following target groups are identified in the frame of the project:

- Science teachers and teacher candidates, staff of partner organizations, students, parents;
- School networks, local and national governments and education authorities, education experts, academics and institutions;
- Civil society, commercial, sectorial and global organizations and the general public.

Table 2. Target groups of the project

ID	Target Group	Target Content
01	Science Teacher, Teacher Candidates and Students (between 10 – 17 years old)	Science teachers and candidates, which are an integral part of education systems and the pillar of science teaching, with alternative and innovative methods and tools in the development of scientific literacy, in the results of this project, to improve their professional skills through the transfer of solutions and experiences and the usability of project outputs. At the same time, students will be tried to face such innovative practices to show another way to learn while having fun, to engage and influence their daily activities.
02	Staff of Partner Organizations	These groups can be an effective tool in ensuring the widespread impact of the project. Thus, by providing the multiplier effect at local and regional level, it can get closer to the goals of the project. In this context, incentives will be triggered to raise awareness of innovative practices and thus open the door to new applications in different learning areas.
03	Parents, Education Authorities, Education Experts, Civil Society	Local and regional participants, students, parents, education authorities, representatives of the education sector, civil society representatives in the field of education and groups directly and indirectly related to education will form our local community in order to transfer the intellectual outputs and thus to spread the project results to large masses.
04	Sectorial and Global Organizations	These organizations to be more active in the field of education; to determine the intersection points so that the services / products they produce in the context of innovative technologies and education reach more to the people involved in education; We will try to guide the sectoral policies and actions

05	School Networks Academics and Institutions	In order to protect the holistic structure of education and equal opportunities, it is important that such applications are known and usable by everyone. In this context, we will try to ensure the circulation of innovative project results among such institutions and to influence school practices in order to share solutions for organizations in the environment and school network with similar needs. In addition, since teacher training organizations such as universities will make an effective contribution to the sustainability of innovative experiences, we will endeavour to circulate and use our project results in the relevant department curricula.
06	Local and National Governments	They are officials in decision making and educational policy making. In this context, to influence national level practices / education policy actions; In order to increase the usability of the project results, to expand their impact and to convey them to more masses, awareness is targeted through various tools such as reporting, press releases, social media citations, etc.

Partnership

The consortium was established with 7 organizations from 5 different program countries:

P0 - Coordinator is a public school that implements differentiated and enriched education in a hands-on workshop style with a learning-by-doing pattern in order to maximize the cognitive and general ability development of gifted students aged 7-17.

P1 - Ministry of Education General Directorate of Special Education and Guidance Services; It is a national education authority responsible for coordinating Science and Art Centers at the country level.

P2 - Mersin University is an institution that trains teachers with a deep-rooted history in different academic branches.

P3 - RobyCode; is a German organization that develops smart solutions, carries out various collaborations and develops the innovation ecosystem with innovative projects.

P4 - Agrupamento De Escolas De Portela E Moscavide, especially by creating digital technologies and classrooms of the future; It is a Portuguese school that aims to maintain students' interest in learning and achieve better learning outcomes.

P5 - Istituto Istruzione Scolastica Superiore "Carlo Alberto Dalla Chiesa" school curriculum; It is an Italian school built on European skills, 21st century competences, active citizenship skills and the arts.

P6 - National High School of Informatics, with 53 years of history, under different names, is a highly prestigious Romanian educational institution offering an adaptable multicultural learning environment.

Table 3. Partners of the project

PP	Country	Organization
P0	Turkey	Hadiye Kuradacı Science and Art Center
P1	Turkey	Ministry of Education General Directorate of Special Education and Guidance Services
P2	Turkey	Mersin University
P3	Germany	Robycode UG
P4	Portugal	Agrupamento De Escolas De Portela E Moscavide
P5	Italy	Istituto Istruzione Scolastica Superiore "Carlo Alberto Dalla Chiesa"
P6	Romania	Liceul National De Informatica Arad

PROJECT MANAGEMENT APPROACH

Overall Management Strategy

The partners collectively complement each other with their organizational culture and project experience to bring a different perspective to the project. Sharing of tasks; Allocated taking into account the strengths, expertise and capacities of the partners. In this respect, the project design focuses on ensuring the active participation of the consortium partners in the project and the quality of the intellectual outputs and other outcomes. Some partners will lead a short-term training and dissemination event for their home country and other countries to maximize their skills and capacities.

A partnership process has been planned in which all responsibilities, risks and management and monitoring at every stage are determined for successful and effective project management. Depending on the range of experience, the partners support each other. According to the stakeholder analysis, the distribution of duties and responsibilities led by the partners, but with the participation of other partners, is as follows:

Table 4. Management leads of the project

PARTNER	MANAGEMENT LEADS
Coordinator – P0	Project Management – Coordination, Quality Assurance and Internal Evaluation
All Partners	Implementation of Activities - Financial monitoring
P2 and P6	Impact Assessment
P3 and All partners	Promotion and Visibility
P1, P2 ve P4	Exploitation - Sustainability Plan
P1, P3 ve P5	Dissemination
P1 ve P2	General Monitoring Evaluation

Common responsibilities:
• Local dissemination events
• Support for monitoring and evaluation
• Financial management
• Check and correction
• Support for the project report
• Planning the activities with the coordinator
• Dissemination and use of project results
• Realization of activities and logistics organization
• Instant communication in case of risk
• Support for updating and branding of the project web page

Three transnational project meetings were planned to monitor and evaluate the progress of the project and plan future tasks. Each partner adjusts the frequency of project team meetings to be held in their own locality, according to the dynamics required by the various stages of the project and local situations. In addition, the partners hold online meetings once a month for project management and especially during the creation of intellectual outputs.

Project Management Structure / Approach

Science e-Robot project management takes into account the strengths, contexts and expertise of all partners to ensure the work plan and implementation of the project.

Table 5. Responsibilities of the partners

Roles	Responsible	Responsibilities
Project Coordinator	Coordinator	The coordinator not only assumes the leadership of the project in the role of the legal representative, but also conducts monitoring and evaluation for the management, communication and coordination between the partners, planning the project meetings with the partners, a transparent and accountable financial management, control of the project implementations throughout the project period; Responsible for coordinating the 1st transnational project meeting with P1 and leading the first intellectual output. It also resolves disputes between partners. Responsible for the creation and monitoring of the Quality Management Plan. It is responsible for transmitting all outputs within the scope of the project to the Agency. Provides communication with the National Agency.
Project Execution Process Group	Project contacts of partner organizations	This group ensures coordination between partners and resources. It records actual or potential risk situations and develops risk reduction / prevention strategies. On the other hand, it creates project progress evaluation / development reports in 6-month periods, if any, in cases involving changes in the project. All partners comply with the communication protocol; The reports are uploaded to the online collaborative platform and are always up-to-date and accessible.
Monitoring and Control Group	Persons identified from the project teams of partner organizations	This group works to continuously monitor the practices of the partners so that the project progresses as desired. Continuously monitors and renews the contact information of the project partners; It updates status reports at the current stage, information obtained from monitoring tools, changes made, risk records and changes, if any. It also provides information to the project partners for necessary corrections. It makes a report every 6 months and uploads it to the collaborative platform.

Steering Process Group	Legal representatives of partner organizations	This group monitors the data generated throughout the project; It provides a 12-month project preliminary evaluation (interim report) report, which includes the level of achievement of the objectives, the evaluation of the project results, the project stages that need to be developed and the views on the sustainability process.
Dissemination Team	P0, P1, P3 and P5	This team is responsible for the preparation of the overall communication and dissemination plan of the project. It also monitors a planned dissemination process at various levels so that the expected results of the Project reach the target groups and stakeholders.
Use of Results and Sustainability Team	P0, P1, P2 and P4	This team is responsible for the use of the project results and the development of the sustainability plan.
Transnational Project Meetings (TPMs)	P1, P3 and P5	TPM-1: P1, TPM-2: P3, TPM-4: P5
Learning-Teaching-Training Activities (LTTAs)	P4 and P6	LTTA-1: P6 LTTA-2: P4
Multiplier Events (MEs)	P1, P3, P4, P5 and P6	ME-1: P1 (TURKEY) ME-2: P3 (GERMANY) ME-3: P4 (PORTUGAL) ME-4: P5 (ITALY) ME-5: P6 (ROMANIA)

Management Procedures

In order to provide the communication infrastructure, each partner appoints a person who has a good command of the English language as a contact person. Providing information to the project partners by the coordinator, building trust and defining their responsibilities and rights; perhaps most importantly, it makes a Partnership Agreement to ensure a smooth cooperation.

Partnership (Bilateral) Agreement:

It is valid from the date of signing between the partners of the partner institution/organization and the coordinator until the end of the project. Its content is determined by the following topics, and shared with the consortium partners, and their opinions are taken into account;

• Project duration, obligations,
• Use of finance and financial arrangements,
• Duties and responsibilities in project activities,
• Providing adequate human and physical resources for project activities,
• Sustainability and copyrights,
• Carrying out and participating in activities,
• Contributing to the communication process and complying with the plan,
• Practical and logistics organization
• Resolution of disputes,
• Progress report editing,
• Monitoring, evaluation, dissemination tasks
• Certification (Recognition)
• Rights and responsibilities

Each partner organization creates its own Project Management Team and the task distribution is formalized within the team, including communication and timing. The task distribution of the Project Management Teams created to ensure synchronization within the consortium is similar for each partner. A digital and real project folder will be created by the authority of the partner organizations and project management documents, plans, templates, etc. are preserved in these folders.

Partner institutions carry out dissemination activities for the promotion and information of the project in their own locality. Project partners have a Gantt Chart containing their project activities. The partners of the countries where the activities will take place work on a common program by keeping in touch with the coordinator and prepare the project meeting / mobility programs. The program is shared with all partners and necessary corrections and tasks are determined. In addition, the Whatsapp group established for the consortium and e-mail are contacted in order to determine the logistics and practical issues.

Consortium partners determine the primary and secondary stakeholders that will benefit from the project in their own locality and conduct stakeholder analysis. Thus, the contribution of the stakeholders involved in the project to the project is known and a transportation strategy is assigned to the stakeholders. Necessary official measures are taken in order to reach the target groups particularly affected by school education and the local authorities as final beneficiaries. In addition, partners renew risk analyzes in preparation for monitoring and activities throughout the project, make a timing plan where resources are allocated to ensure time management, and determine precautionary strategies to avoid delays. If the changes to be made are foreseen, the partners inform each other instantly. Throughout the project, the partners plan and share in partnership the monitoring of their duties / responsibilities, which forms the basis of the monitoring of the project.

Considering the success of the project, the Quality Management Plan determined to ensure the appropriate time and budget control that will ensure its performance is complied with. By

updating time and resource planning; Efforts are made to realize the performance by ensuring the effective use of the project budget. To ensure time management, project activities (meeting, short-term training, dissemination, etc.) were distributed proportionally to the entire project duration. The coordinator has created the project activity program, taking into account the capacities of all partners and their duties in the project.

Each partner; periodically updates the tasks and responsibilities in the project, equipment, equipment and human resource planning.

Project Scope Management Plan

Project management consists of 5 work packages.

WP-1: Project Management
WP-2: Intellectual Output-1 (Integration of Educational Robotics into Scientific Learning Teaching Process Open Educational Resource-OER)
WP-3: Intellectual Output-2 (Practical Methodological Guide to Robotic Assisted Science Teaching)
WP-4: Intellectual Output-3 (Comprehensive Measurement and Evaluation Toolkit)
WP-5: Dissemination and Evaluation

These work packages constitute the deliverables under the project. Each Work Package consists of subtasks and these subtasks indicate progress indicators. The success of a good project management; depends on time, cost and quality of project outputs. In this context, qualified and appropriate project outputs reflect the quality of the project.

The quality of the outputs is one of our milestones in reaching the goals of the project. Therefore, the P0, P1 and P2 partners, who lead the creation and monitoring of the outputs, monitor the outputs in the following dimensions:

a. Desired features such as innovativeness, usability and expected effect;
b. Whether the project was completed in accordance with the activity calendar;
c. Compliance with the format determined at the first project meeting;
D. Quality will be monitored in terms of compliance with the intellectual output budget.

Periodic monitoring reports, which include the progress of the outputs and their realization within the determined budget and timing, the opinions of the partner country teams, the activity and expenditure report and the work timetable records will be a source in the monitoring.

Table 5. Indicators of project progress

Work Package	Progress Indicators	Measurement of Indicators
WP-1: Project Management	Implemented monitoring and management tools (Quality Management Plan and tools), High participation online and face-to-face meetings, Well-defined roles and responsibilities The results obtained from the internal and external	Project documents (contracts/agreements), The minutes, Reports, Invoice or payment documents, Signature charts, Other tangible outputs

	evaluation and the National Agency evaluation,	
WP-2: Intellectual Output-1 (Integration of Educational Robotics into Scientific Learning Teaching Process Open Educational Resource-OER)	The number of course activities developed in different learning models, The number of various robotic materials used in the development of activities, The nature of the activities, Number of people with increased knowledge and skills in using OER, Number of users (target groups) registered with the OER, OER users satisfaction percentage,	Work timesheets, Platform user records, Added activities Pilot test results, Qualitative and quantitative feedback, National and international sources representing the platform, Payment documents,
WP-3: Intellectual Output-2 (Practical Methodological Guide to Robotic Assisted Science Teaching)	The number of modules developed, The number of times the output was loaded, Percentage of users' satisfaction, Number of people with increased innovative method capacity in science learning,	Work timesheets, The final digital or printed format of the output, The content of the modules, Channels where the output is loaded, Qualitative and quantitative feedback, Payment documents,
WP-4: Intellectual Output-3 (Comprehensive Measurement and Evaluation Toolkit)	The number of tools in the output content,	Work timesheets, The final digital or printed format of the output, Payment documents,
WP-5: Dissemination and Evaluation	Communication and Dissemination Plan, Exploitation and Sustainability Plan, Project website and social media accounts, The number of events / activities for the promotion and use of the outputs,	Website and social media counter, Produced plans and other documents, Visual, audio and textual visibility materials of the events, Issued certificates, Signature charts,

Schedule Management Plan

Project partners have the Gantt Chart. In addition, updates can be made through communication channels.

Table 6. Project timeline

Tasks / Deliverables	Sub-Activities	Responsible Partners	Deadlines
WP-1: Project Management	1.1. Transnational Project Meetings,	1.1. P1, P3 and P5	30.03.2021 30.04.2022 30.11.2022
	1.2. Online gathering and reporting of the Project Execution Process Group,	1.2. P0	Last Friday of every month
	1.3. Online gathering and reporting of Project Monitoring and Control Group,	1.3. P0	in 6 month periods
	1.4. Online gathering and reporting of the Project Steering Process Group	1.4. P0	
	1.5. Organization of online meetings,	1.5. P0	Last Friday of every month
	1.6. Development and Application of Quality Control and Evaluation Tool;	1.6. P0 and All Partners	30.12.2021
WP-2: Intellectual Output-1 (Integration of Educational Robotics into Scientific Learning Teaching Process Open Educational Resource-OER)	2.1. Design, dissemination, implementation, analysis and publication of survey and focus group interview scales;	P0 (Output leader) and All Partners	30.04.2021
	2.2. Determination of targets and audience needs (analysis of scales and country data), task sharing, planning;	All Partners	15.05.2021
	2.3. Configuration of the e-workbook Platform;	P3	15.06.2021

	2.4. Content development and editing;	P0, P1, P2, P4, P5, P6	30.08.2021
	2.5. Prototype (e-workbook platform) development;	P3	30.04.2022
	2.6. Piloting and testing;		30.05.2022
	2.7. Collection/analysis of feedback;	All Partners	14.06.2022
	2.8. Making the edits and finalizing/publishing the OER.	P0 and P3	20.06.2022
WP-3: Intellectual Output-2 (Practical Methodological Guide to Robotic Assisted Science Teaching)	3.1. Design, dissemination, implementation, analysis and publication of survey and focus group interview scales;		31.10.2021
	3.2. Determining the structure of the methodological guide;	P2 (Output Leader) and All Partners	31.03.2021
	3.3. Construction of Module 1;		30.04.2021
	3.4. Construction of Module 2;		31.05.2021
	3.5. Construction of Module 3;		30.06.2022
	3.6. Construction of Module 4;		31.07.2022
	3.7. Building module 5 and publishing the output.		31.08.2022
WP-4: Intellectual Output-3 (Comprehensive Measurement and Evaluation Toolkit)	4.1. Clarification of Toolkit format;	P1 (Output Leader) and All Partners	30.06.2022
	4.2. The making of Part 1;		31.07.2022
	4.3. The making of Part 2;		31.08.2022
	4.4. The making of Chapter 3; Pilot studies		30.09.2022

	and completion/publishing of output.		
WP-5: Dissemination and Evaluation	5.1. Project logo and poster design;	All Partners	27.02.2021
	5.2. Creation of the project website and social media accounts;	P3 and P5	30.03.2021
	5.3. Development and Implementation of Dissemination Strategy and Tool;	P0, P1, P3 and P5	31.05.2022
	5.4. Use of Results and its Sustainable Plan;	P0, P1, P2 and P4	30.06.2022
	5.5. Impact Assessment	P0, P2 and P6	30.12.2022
Progress Report	• Preparation of expenditure, dissemination and activity reports;	All Partners,	31.12.2021
	• Checking the reports and presenting the progress report to the National Agency	P0	30.01.2022
Final Report	• Preparation of expenditure, dissemination and activity reports;	All Partners,	30.01.2023
	• Checking the reports and presenting the Final Report to the National Agency	P0	15.02.2023

Risk Management Plan

Although risks are undesirable, their existence is possible and they are elements that can affect the project. In this respect, the risks that may affect the project should be identified and eliminated/eliminated. It is normal for potential conflicts or misunderstandings to arise in our project, where there is diversity and different institutional contexts. Therefore, project partners are aware that risk analysis is the best way to avoid risks, taking into account the scale of the project. In this context, our risk plan, which reveals a risk analysis, will work as follows:

1-Detection of possible risks
2-Defining the risks: The degree of impact, probability of occurrence and prevention activities

We collect risks in two groups:

The first group is the risks related to the project partners and the other is the independent risks.

The fact that the project partners have different country cultures and different contextual foundations is considered a risk factor even though it adds diversity to the project. Because it can be one of the main reasons for the conflicts that may arise between the project partners. The best way to overcome this is to provide good communication management between the project partners. Therefore, in order to be able to communicate well with each other, each partner organization will appoint a person with a good command of English as their contact person. It is a sensitive issue that the people who will provide communication between the partners provide instant information. On the other hand, it is recommended that the project team, which will be established by each partner, improve their language level through various resources such as Erasmus+ Apps, Online Linguistic Support, which will improve their English language level. In addition, communication and interactions to be established through multiple communication channels such as skype, e-mail and social media, where the partners will meet during the project cycle, are effective actions that can prevent misunderstandings and conflicts. In addition to these, in addition to the small team activities for the working efficiency of the project team formed in each country in its own locality, the first stage of each transnational project meeting will be socialization and ice breaking activities, thus contributing to the team dynamic in which good communication is ensured.

Another important risk factor is the withdrawal of some of the partners from the project. Currently, the consortium consists of 5 countries and a total of 7 organizations. In case of withdrawal of a partner from the consortium, action will be taken within the framework of the partnership agreement. In addition, before starting each joint activities, in case of the possibility of people withdrawing from the project, a backup team will be determined for the main project team formed in its own locality. In case of withdrawal, people from the reserve list who have the capacity to fulfill their duties will be included in the project.

Another risk factor is the lack of clarification of rights, responsibilities and duties. It will be discussed at the first project meeting to prevent this risk; It will be recorded in a Partnership (Bilateral) Agreement in which duties and responsibilities are clarified. Partner countries will also clarify the roles and responsibilities of the project team at their local level through participant agreements. In addition, the project coordinator will identify the failing aspects through the monitoring activities to be carried out for the activity plan, and arrangements will be made in communication channels and project meetings.

In order to avoid delays and financial difficulties in mobility, each partner will arrange the necessary travel procedures on a date. For this, the project teams will provide passport, visa, etc. documents before the travel dates. Necessary information will be provided to the host organization on accommodation and nutrition in a timely manner, and safe, clean and easy-to-access accommodation will be selected. In addition, information on vegetarianism, allergic status, drug use / not, etc. will be reported to the host organization in a timely manner. Safety information packages for mobilities will be prepared by each partner and shared with partners / local people (families, institutional information).

The partners of the countries where the mobility will take place will determine the dependent and independent risk factors according to their working areas and regions and will make arrangements for this. Partners will be sensitive about financial management risks; When necessary, information and documents will be provided and expenditures will be supported with valid documents. In order to avoid weakness in financial management, resources, materials, etc. will be procured in advance; Necessary arrangements will be made during monitoring and evaluation activities.

Another risk factor is the low participation in the project activities. One of the best ways to prevent this is to know the events in the activity calendar in advance by the relevant people

and to determine the backup participants. Social media, official channels and other means of communication are promotional tools that can be effective in communication.

The risk group independent from the partners is the natural events (disasters), international disputes / policy practices, epidemic / non-epidemic diseases, serious injuries and disabilities, and death.

Strategy of the Project Quality Control

Internal Evaluation

The Science e-Robot project aims to provide high quality project outputs and smooth project implementation. Therefore, it has determined the monitoring and evaluation strategies and methods.

Under the coordination of the coordinator; Internal evaluation practices to be carried out under the responsibility of project process groups and project partners involved in impact assessment focused on the quality of the results. In this context, the P0, P1 and P2 partners, who are leaders in the creation and monitoring of the outputs, monitor the outputs in the following dimensions:

a. Desired features such as innovativeness, usability and expected effect;
b. Whether the project was completed in accordance with the activity calendar;
c. Compliance with the format determined at the first project meeting;
D. Quality will be monitored in terms of compliance with the intellectual output budget.

Project process groups will contribute to the monitoring and evaluation of project applications with the reports they will create. In addition, the internal evaluation report to be prepared by the P0 and P2 partners will provide the overall internal evaluation of the project.

In addition, Transnational project meetings; meeting minutes and participant evaluation questionnaire; Quantitative monitoring of short-term training activities and dissemination activities will be supported by the Adult Education Evaluation Scale and the Achievement Evaluation Rubric.

External Evaluation

We will use different indicators and data sources that will allow us to measure the project impacts in the short, medium and long term, taking into account geographical criteria. We will follow a methodology that uses qualitative and quantitative tools to measure whether our project activities and other actions make a difference to the problem situation we are addressing.

The project coordinator is responsible for impact management and assessment with P2 and P6 partners; The project will issue the impact assessment report for the interim and final report.

Project impact;
*Individuals (project participant and staff, student)
* Consortium organizations
*We will evaluate at local/regional/national/transnational dimensions.

assessing impact on individuals and partner organisations; The "Participant Questionnaire" developed by the European Commission to collect quantitative data from the project participants, staff of partner organizations and students and to be obtained from the Turkish National Agency, and the "Selfie Evaluation Tool" developed by the European Commission, which makes self-evaluation of institutions in education and training practices using digital

technologies. "Corporate Capacity Survey" will be used with ". "Individual Interview Questionnaire" and "Focus Group Interview Questionnaire" are the tools to be used for collecting qualitative data. We will conduct focus group meetings and individual interviews with project activities participants from consortium organizations through face-to-face / skype meetings.

Apart from these, we will quantitatively evaluate the impact on learning environments through the "The OECD School User Survey: Improving Learning Spaces Together" questionnaire developed by the OECD, which produces information on the effective use of learning spaces in project partner schools and universities and how they can support teaching and learning practices of the 21st century.

In addition, to see the impact on the project partner organizations; The "OECD Education and Skills Online Questionnaire" will be conducted for the staff of the consortium members, which tries to assess their skills and determine their literacy needs. Creative Problem Solving and Critical Thinking Skills questionnaires to be applied to students, teachers and prospective teachers to see the impact on 21st century core competencies are also tools to be used.

In order to determine the views of the participants and students on the subject of the project, robotic assisted science teaching and 21st century skills, and to see the impact better, we will apply an online survey to be prepared under the guidance of the university on the project website before and after the project implementations, and analyze the results for impact assessment.

Technological pedagogical content knowledge self-efficacy scale to be applied to participant staff and teacher candidates will be another quantitative data provider of the impact on individuals. On the other hand, it is sometimes difficult to identify ideas and thoughts, needs, motives and attitudes, interests and behaviors. Therefore, the psychological, social and cultural effects of the project, which are among the other results;

*Written feedback from partners
*We will qualitatively determine the quality of thoughts, attitudes and interests of students, teachers and teacher candidates through the observation form and the self-evaluation form.

QUALITY MANAGEMENT PLAN TOOLS

Management Structure and Consortium Quality

The partners will collectively complement each other with their organizational culture and project experience to bring a different perspective to the project. The sharing of tasks was allocated taking into account the strengths, expertise and capacities of the partners. In this respect, the project design focuses on ensuring the active participation of the consortium partners in the project and the quality of the intellectual outputs and other outcomes. Some partners are leading a short-term training and dissemination activity for their own country and other countries to maximize their skills and capacities.

A partnership process has been planned in which all responsibilities, risks and management and monitoring at every stage are determined for successful and effective project management. Depending on the range of experience, the partners support each other.

The coordinator school (P0) applies differentiated and enriched education in a hands-on workshop style with a learning-by-doing pattern in order to maximize the cognitive and general ability development of gifted students aged 7-17.

MEB ORGM (P1) is the national education authority. The project will attempt to disseminate and exploit its results.

Mersin University (P2) is a teacher training institution with a deep-rooted history in different academic branches. In the project, he employs his knowledge to add an academic perspective with a team of 3 professors and associate professors. It provides the validity and reliability of the project outputs and their usability by everyone for teachers, students and teacher candidates by providing expert opinion on designing science activities with achievements suitable for science subject areas and student age level.

RobyCode UG (P3); is a German organization that develops smart solutions, conducts various collaborations and develops the innovation ecosystem with innovative projects. It currently carries out computational projects aiming to develop smart solutions based on innovative approach. They use their expert staff and computational experience to improve the quality of project results.

The Portuguese school (P4) provides more opportunities for the development of science activities with robotics by using the outputs of the national robot projects they carry out.

The Italian school (P5) carries out basic robotics and STEM applications. They bring their interdisciplinary working experience into partnership with the project team.

Romanian school (P6) has national championships in robotic design. They follow and use robotic applications that are widely used in Europe. School with a good robot team and cooperation in different branches; employs skills that develop team dynamics in designing creative activities with other partner schools. They also add creative diversity to the use of alternative robotic materials in events.

The coordinator not only takes the lead of the project in the role of legal representative. At the same time, it is responsible for the management, communication and coordination between the partners, planning the project meetings with the partners, transparent and accountable financial management, monitoring and evaluation for the control of the project implementations throughout the project period. He is also responsible for coordinating the 1st transnational project meeting with P1 and ensuring the 1st intellectual output.

P0; P4, P5 and P6 are involved in designing multidisciplinary and interdisciplinary learning scenarios in modern teaching models focusing on creative, critical thinking, problem solving, communication and collaboration skills for robotic supported science activities for scientific themes and sub-topics to be determined by the partners at the first meeting. These schools take an active part in the creation of all intellectual outputs within the scope of their competencies and will also carry out activities to measure the impact of the outputs and disseminate them locally.

Toolkit idea output leader P1; The 1st transnational project meeting is responsible for dissemination, sustainability and monitoring and evaluation of all outputs.

P6 is responsible for designing OER activities from the project outputs and creating the content of the guide and toolkit by actively participating with a team of 5 people. It also hosts the first short-term training activity for the OER.

P5 will also design science activities with other schools, including the type of robot they use for OER and guide output, and is preparing studies on other intellectual output. It also hosts the 2nd project meeting activity.

P4 hosts the 2nd short training session along with other missions. All school partners are also responsible for disseminating project outputs and results.

P2 uses academic perspectives in designing educational robotic activities suitable for target group student age levels. In the first project meeting, with the knowledge and guidance of academicians who are experts in their fields, they provided support in determining common scientific theme areas and sub-topic areas for the project countries. He is responsible for the creation of the activity outcomes, the design of the activity implementation plan (activity template) and instructional design. Another important task is to lead the output of the methodological guide for teachers, which is valid and reliable for the use of activities designed in accordance with pedagogically different teaching models, to carry out the monitoring, evaluation and dissemination and the project impact assessment together with the P6 partner.

Having human and hardware resources, P3 uses its knowledge and skills related to digitization and licensing of the events created. It is tasked with providing the digital design and design of an open educational resource (OER), methodological guide and toolkit that will be available to everyone, with its computational skills and networking skills. Dissemination activity on the use of all intellectual outputs, participation in short-term trainings and the 3rd project meeting will be held. It has responsibilities related to the publication and sharing of intellectual outputs to be prepared in the language of the project partners and in English, and the dissemination of other project results.

Monitoring and Evaluation Quality

Project activities and outputs will be carried out according to the project timeline prepared by the coordinator. It will be monitored and evaluated with the detailed reports below. In addition, quality control will be ensured through transnational project meetings and periodic online meetings.

Activity Reports

Within the scope of the project implementation, there is an activity in which each partner is the leader. Each partner submits annual reports to the coordinator at the end of each activity. In addition, each work package leader creates short activity reports on the activity's duration, cost, sub-tasks, efforts and achievements.

There are 5 main work packages within the scope of the project and each work package has a leader. These main work packages contain subtasks. Each activity leader and other partners submit their "Annual Reports" to the coordinator. These reports are evaluated by the coordinator and discussed with other partners at project meetings.

Table 7. Template for activity reports

Template for Activity Reports	
Work Package No	
Work Package Title	
Actual start date (dd/mm/yy)	Actual end date (dd/mm/yy)
Costs	
Package leader	
Partners participating in the WP	
Work package aims	
Activity carried out (including milestones)	
Changes, corrections in the activities compared to plans and reasons why	
Description of methodological / pedagogical framework (where relevant)	
No. and title of the result / product / process	

Interim and Final Report

Project interim and final reports are the main justifications for project activities and expenditures. These reports that need to be prepared are provided by the coordinator. However, other partners are responsible for assisting in the preparation of reports.

Interim Report (Progress Report), at the end of the first year of the project; The Final Report has to be submitted within 2 months after the end of the project. All partners are responsible for submitting the necessary information and documents to the coordinator for the reports to be prepared in accordance with the format determined by the National Agency. These reports are prepared to include the expenditures, achievements, results and other information of the project. The Interim Report will provide an opportunity to evaluate the progress of the project. The Final Report is throughout the life of the project; project activities, results, outputs, expenditures, multiplier effects.

Project Expenditures and Monitoring

The project coordinator informs all partners about the project expenditures. According to the grant agreement, the distribution of the budget to the project partners is carried out through the bank. Budget allocation is made after the reports submitted.

Table 8. Budget distribution timeline

Month of the project	1-2	6	12	14	18	24	>24
Report No.		1st	2nd		3rd	4th	
Instalment to be made	40%			40%			Balance (max 20%, depending on National Agency's evaluation)

As stated in the grant agreement and financial guideline of the call, all project expenditures must be related to project activities and project budget. Each project partners comply with the following general rules:

- Erasmus+ Guide and Grant Agreement must be read (coordinator should share the documents with all project partners)

- All project partners should obey the financial rules identified in the guide and grant agreement while spending the project budget.

- All expenditures should be related to the project activities; non-related expenditures will be considered as ineligible and will not be reimbursed by the National Agency.

- All project expenditures must be recorded and accounted.

- All documents related to project expenditures must be kept; timesheets, price offers, agreements, invoices, procurement documents etc.

- Project partners must provide their expenditure tables and financial documents to Hadiye Kuradacı Science and Art Center.

- Project partners should provide all necessary information and documents to the project coordinator in the reporting formats; for both interim and final reports.

Project expenditures will be monitored with the following reports:

Table 9. Template for expenditure table

Template for Expenditure Table						
Partner No	**Expenditure Explanation**	**Period of use in the project (months)**	**Budget Cost**	**Purchase Cost**	**Purchase Date (dd/mm/yy)**	**Invoice No and Date**

Feedback Analysis

In particular, the first intellectual output was the Open Educational Resource (OER); A pilot test will be conducted to ensure the content and structural quality of the e-workbook platform. The pilot test will be created by the output lead project coordinator and all partners will deliver it to the target groups through various channels. In addition, evaluation of other intellectual outputs and multiplier activities will be shared by the project partners through various tools. The partners responsible for the impact assessment will make the impact of the project implementations and results together with the target groups through various channels through quantitative and qualitative methods.

Dissemination Quality

Our dissemination strategy/plan has been made in order to ensure the desired effect of the results produced within the scope of the project. There is a planned dissemination process at various levels so that the expected results of the project reach the target groups and stakeholders. Dissemination activities are monitored and evaluated by the project coordinator and the partners responsible for the dissemination plan. By working closely with the project partners, the results and activities achieved throughout the project are within the partnership; will be offered at each partner organisation, local and wider communities.

Successful completion and impacts of the dissemination strategy will reflect the quality of the project as a whole. In this respect, our strategy includes the following:

* Dissemination of the project as a whole,
Project website/Social media/Local, Regional, National press and Promotional materials;

* Dissemination of concrete results,
dissemination of intellectual outputs in large communities;

Starting from within the partner organizations; In partnership, we will follow a dissemination process with different levels of objectives towards the target audience - other stakeholders / beneficiaries and policy makers / decision makers and the public. We will use a dissemination mechanism with tools such as written, visual, audio, web-based and social media selected according to the target groups. Dissemination activities will be carried out by paying attention to confidentiality and copyrights. Special attention will be given to project branding; A competition will be held to determine the project logo by the target groups. Project-specific common writing style, font and images will be used.

Table 10. Dissemination monitoring report

Integration of Educational Robotics to Scientific Learning Teaching Process					
			2020-1-TR01-KA201-092601		
			By Organisation Name :		
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
When	Type of dissemination	Description	Level (Regional, National, European)	Web address or indication where you can find it	Kind and number of stakeholder, public, etc.

COMMUNICATION MANAGEMENT PLAN

The Communication Management / Protocol determined by the coordinator and partners defines the communication framework of the Science e-Robot project. The Communication Management, whose roles, duties and deadlines are defined in detail in the Communication and Dissemination Plan, acts as a guide for all partners. It also maps the communication requirements, tools and communication management for this project. It can be updated according to the changing dynamics.

Table 11. Communication protocol of the project

COMMUNICATION PROTOCOL				
In Partnership				
PARTICIPANTS	MEETING TIME	HOW TO MEET	TOOLS THAT CAN BE USED	CORRESPONDENCE AND STORAGE
All Partners	Periodically once a month (on the last Friday of each month)	Online	Zoom, Google meet, Skype, Hongoust, Messenger etc	email, Whatsapp, Messenger, collaborative working platform (sync)
All Partners	Face-to-face international project meetings on the 3rd, 16th and 23rd months	Face-to-face	-	-
Execution Process Group	Regular meeting on the last Friday of every month during the project	Online	Zoom, Google meet, Skype, Hongoust, Messenger etc	email, Whatsapp, Messenger, collaborative working platform (sync)
Monitoring and Control Group	Periodically every 3 months	Online	Zoom, Google meet, Skype, Hongoust, Messenger etc	email, Whatsapp, Messenger, collaborative working platform (sync)
Steering Process Group	Periodically every 6 months	Online	Zoom, Google meet, Skype, Hongoust, Messenger etc	email, Whatsapp, Messenger, collaborative working platform (sync)

COMMUNICATION PROTOCOL		
Outside Partnership		
WHO?	**WHY AND WHEN?**	**HOW ?** (TOOLS THAT CAN BE USED)
Target Groups (10-17 Years Old Students, Science Teachers and Science Teacher Candidates) **Local Authorities / Decision Makers** **The General Public**	*Continuous communication should be established with the target groups throughout the project; * Attend periodic meetings or activities, especially for the availability of project impact and results; * Various European and other international digital platforms should be used to promote and exploit the project intellectual outputs; * For the local / regional / national recognition of the project, periodic communications should be established with various media and broadcasters.	Partners websites, Facebook, YouTube channel, Moodle, eTwinning, EPALE, Erasmus + Results Platform, Local / Regional / National press broadcasting, news bulletins, SEG (School Education Gateway), Face-to-face meetings / activities, Online meetings / activities, official correspondence... etc

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