Co-funded by the
Erasmus+ Programme
of the European Union

Enhance
Maintenance - Production - Quality

619130-EPP-1-2020-1-FR-EPPKA2-CBHE-JP

Selection: 2020

KA2 – Cooperation for innovation and the exchange of good practices –
Capacity Building in the field of Higher Education

strENgtHening skills and training expertise for TunisiAN and MorocCan transition to industry 4.0 Era / ENHANCE

D3.2 Sustainability assurance plan

Deliverable Identifier	**D3.2**
Deliverable Date	**M24 – 14/01/2023**
Deliverable Version	**V 1.4**
Deliverable Leader	**BIBA**
Deliverable participants	**All**
Dissemination Level	**public**

Document Control Page

Title	Sustainability assurance plan
Version	V 1.4
Deliverable number	D3.2
Work-Package	WP3
Status	☐ Draft ☐ Under Review ☐ Under Update ☐ Accepted by the coordinator ☒ Submitted to the commission
Authors	Zied Ghrairi
Contributors	All partners
Peer Reviewers 1:	Achraf Ammar (IIT)
Assigned Date	18/12/2023
Received Date	20/12/2023
Peer Reviewers 2:	Andre Rocha (UNL)
Assigned Date	20/12/2023
Received Date	22/12/2023
Date of Delivery	14/01/2024
Dissemination level	☒ Public ☐ Confidential, only for ENHANCE Consortium (including EC) ☐ EU-Restricted

Version History

Version	Date	Description	Edited by
1.0	03.06.2022	Initial Version	Zied Ghrairi
1.1	13.10.2022	Draft for Consortium sharing	Zied Ghrairi
1.2	20.01.2022	Final Draft with integration of comments from reviewers	Zied Ghrairi
1.3		Final Version	Zied Ghrairi
1.4		Submitted to the commission	

Table of Contents

Table of Figures

1. Introduction

This document is developed as part of the ENHANCE project.

1.1. Purpose of the document

To assure the long-term perspective of the project outcomes a strategy to support sustainability was worked out to be maintained after the end of EU funding.

1.2. Reference documents

n/a

1.3. Applicability

n/a

1.4. Definitions

This section aims to provide some relevant definitions and to make the distinction between 3 concepts that describe interactions with stakeholders: dissemination, sustainability, and exploitation. Although frequently used interchangeably, these terms refer to different processes. In the context of the ENHANCE project, these terms are approached as follows.

Dissemination: In the context of EU-funded projects, dissemination is the process of making the results of programs or initiatives available to the end-users, target groups, the key actors to increase public awareness on important subjects and consequently influence policymaking procedures. Dissemination is key not only to the overall success of the project and the sustainability of its outputs even after the end of the funding period. The process of correctly disseminating results needs to be carefully designed not only during the project's lifetime but also after the end of the funding period.

Sustainability: Sustainability is the capacity of the project to continue its existence and functioning beyond its end. The project results are used and exploited continuously. Sustainability of results implies the use and exploitation of results in the long term. A project can be considered sustainable if its outcomes or parts of these continue after the end of the funded project duration. Sustainability may not concern all the aspects of a project. In each project some results may be maintained, while others may not be required to maintain. A project can, therefore, be considered sustainable if relevant results are pursued, and products are maintained or developed after the end of the EU funding.

Exploitation: Exploitation is associated with the use of the project's results at different levels during and after the implementation of the project. It is related to the necessary action that will bring visibility to the project in order to involve the target groups, end-users, and stakeholders and transfer the results/products into their professional scope. Exploitation is mostly related to the idea of convincing the key actors to use the main products and services of a project. Exploitation is closely associated with the sustainability of the project after its conclusion since exploitation activities should ensure that the results of the project are used by its target groups and possibly are transferred to other contexts (e.g., other countries, other pedagogical areas, other sectors). In simple words: Exploitation is the medium to safeguard a project's long-term sustainability.

1.5. Structure of the document

This document is organized in 5 sections:

- Section 1: Introduction.
- Section 2: Enhance project overview.
- Section 3: Sustainability approach for the ENHANCE project.

- Section 4: Potential Sustainability barriers and related measures.
- Section 5: Future sustainability actions.

2. ENHANCE project overview

ENHANCE – strENgtHening skills and training expertise for TunisiAN and MorocCan transition to industry 4.0 Era – is an Erasmus Plus project founded under the KA2 Cooperation for innovation and the exchange of good practices (Capacity Building in the field of Higher Education) programme by the European Commission under Grant Agreement N° 619130, to be conducted in the period January 2021 until January 2024. It engages 7 partners from 5 countries with a total budget of 779k€. Further information can be found at http://eplus-enhance.eu/. Figure 1 gives an overview of the ENHANCE project organization.

The emergence of industry 4.0 concepts and applications brings new paradigms impacting all the industrial business domains when they need to conduct successful digital transformations or increase workshop connectivity. The evolution of Maintenance, Production and Quality Engineering (MPQ 4.0) represents the main application domains where Industry 4.0 produces effective beneficial results. Figure 1 presents the overall ENHANCE project organization.

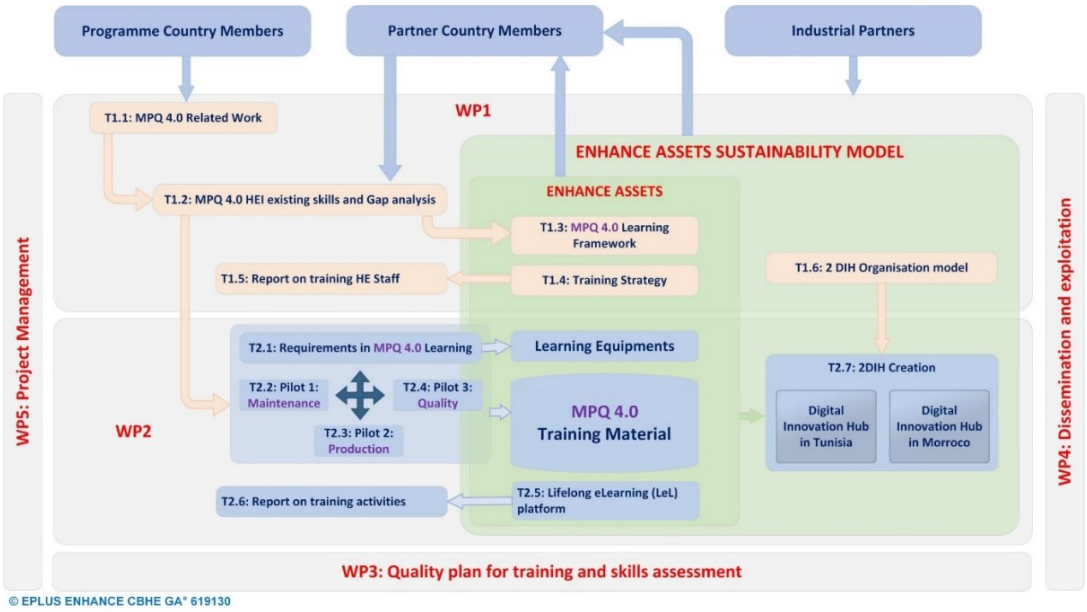

Figure 1: ENHANCE project organization.

The ENHANCE project focuses on building new MPQ training capacities at Higher Education Institutions (HEI) in Tunisia and Morocco to establish interactions between the following stakeholders:

- European universities and research institutions (from France, Germany, and Portugal) confirmed MPQ 4.0 competencies, training materials, collaborative research projects, fully operational Digital Innovation Hubs (DIH), technology transfer experiences, etc.
- Partner country universities (from Tunisia and Morocco) with teaching and training activities in MPQ and existing connections with their local industrial partners.

The ENHANCE project will create several outputs and two primary tangible outcomes:

- New MPQ 4.0 equipment and training materials developed in connection with the existing training programmes and consolidated through three industrial pilots. The new material will be used to train the trainers and the students in the different partner country universities.
- Two DIHs, one in Tunisia and one in Morocco to sustain the project outcomes through their reuse for training in industry.

ENHANCE aims to become the reference model for creating effective and sustainable training material for MPQ 4.0 in both partner countries with content approved by academia and industry.

3. Sustainability approach

3.1. Objectives

A sustainability assurance plan aims to describe the long-term perspective for a project outputs, how they are going to be exploited and how they will create a long-term impact on the target groups defined. The sustainability assurance plan for the Erasmus+ project ENHANCE analyses the different possibilities to maintain and update results and gives a clear picture of necessary activities to ensure that the main project outputs are used in a long-term perspective and the long-term impact targets and indicators are met.

The main sustainability objective of the ENHANCE project is to continue to exploit the results and other resources of the project beyond the project lifetime.

The project aims to achieve the following objectives:

- To **co-create new skills and competencies** through the adopted existing and new created HEIs programmes for PC industries.
- To **convince other universities to adopt and/or apply the project outcomes**, also after the end of the project.
- To **promote** and **raise awareness** with regards to the project contents and developments.
- To **provide information on the quality, relevance and effectiveness of the results**.
- To **successfully transfer** the results and findings to appropriate decision-makers (e.g. authorities) in order to achieve their sustainable promotion and support. The project partners expect that the ENHANCE project will have a significant impact on the educational policy level by demonstrating how HEIs can play a larger role in shaping national science system and innovative economies. The changes the project aims to stimulate will be concerned with strengthening of the governmental support to new graduate programmes built on the Bologna principles[1], with integrated academia-industry and international dimensions.
- To set-up the required infrastructure (platform, CCs, DIHs, Labs with equipment) in PC HEIs to exploit the results.

3.2. Envisaged project outcomes

The outcomes of the ENHANCE project are listed as follows:

- Learning materials dealing with the topics (Maintenance 4.0, Production 4.0 and Quality 4.0). Update/improve the existing learning materials in PC partners with additional content addressing the topics (Maintenance 4.0, Production 4.0 and Quality 4.0).
- New learning methodologies.
- Update existing HEIs programmes. New HEIs Bachelor and Master programmes (if needed).
- E-Learning platform dealing with the ENHANCE topics (Maintenance 4.0, Production 4.0 and Quality 4.0).
- Training of HEIs human resources (lecturers).
- Mobility of students between PC partners.
- Training of external human resources from several industrial sectors.
- Competence centres (CC) in PC partners.

[1] https://education.ec.europa.eu/education-levels/higher-education/inclusive-and-connected-higher-education/bologna-process

- Digital Innovation Hubs (DIHs) in PC partners.
- Extension of existing infrastructure with additional equipment supporting
    - the execution of the developed learning content,
    - the development of demonstrators for the CCs and DIHs.
- Long-term collaboration between ENHANCE partners.

3.3. Potential Strategies and required resources

For a successful exploitation of the ENHANCE project results/outcomes, the following questions have to be addressed:

- **What are the potential strategies/mechanisms to ensure the sustainability of the project outcomes?**
- **Which resources are needed to succeed in the adopted strategies/mechanisms?**
- **From where these resources must be obtained?**

For guarantee the sustainability of the ENHANCE project results, the ENHANCE consortium partners, in collaboration with the associated partners (industrial companies in Tunisia and Morocco) have addressed these questions. The identified mechanisms are described as follows:

The consortium will analyse the strategy and adapt it due to the level of implemented activities and new initiatives caused by the project.

To ensure sustainability following factors are included in the worked-out strategy: the project fully meets academic, professional and social needs of target countries, active participation of all target groups (teachers/students/decision-maker/professionals) is guaranteed, high degree of inter-institutional cooperation, intensive involvement of the non-university partners in the project implementation. The core indicators of sustainability of ENHANCE will be the extent and degree to which the delivery of activities and its impact on target groups that continue to receive the benefits from project activities. Sustainability at a national level will be provided by new national laws, which give PCs HEIs more freedom and autonomy in choosing the subject and content of BSc/MSc programmes to made education closer to employers' requirements.

- **Sustainable communication/dissemination**: communication/dissemination activities (presentation of ENHANCE project outcomes, participation in various international conferences, Online webinars) have to be continued. The ENHANCE website will be active and updated continuously after the end of the project at least for the further 3 years. The representatives of the non-university partner organizations will be involved in the information events and conferences more often and will comprehensively support the project by promoting its vision both within and outside their institutions. Communication channels for the developed CC and DIHs should focus on success stories and collaboration opportunities. All these will give the potential to multiply, disseminate or exploit the results of the project not only in Tunisia and Morocco but also in other countries.

- **Organisation of Workshops:** Workshops have the potential to bring people, ideas, and business together. CC and DIHs have to organise B2B events to better understand the concerns in the industrial environment of Tunisia and Morocco. The outcomes of these events will improve the gap analysis and, therefore, the identification of the required additional competencies/skills.

- **Cooperation with Authorities and Policymakers: The consortium will prove how ENHANCE will have a significant impact on the educational policy level by demonstrating how HEIs can play**

a larger role in shaping the national science system and innovative economies. The results the project aims to produce will be concerned with strengthening the governmental support to new graduate programmes built on the Bologna principles, with integrated academia-industry and international dimensions.

Iterative task: the activity of achieving the sustainability will be discussed during every coordination meeting, implemented by all partner universities, and presented to the national authorities (e.g. Ministries) in Tunisia and Morocco.

- **Commercialisation:** By the end of the project, each PC HEIs and related CC/DIHs is expected to establish a business model for further funding opportunities (training, subcontracting, and development) and maintain the project outcomes after the end of the project. The developed services and training modules will be integrated into the daily educational and training activities of the PC HEIs within the established network.

- **Financial support:** The PC HEIs staff and CCs/DIHs managers must work out a concept for funding acquisition from EU and national authorities. The sustainability of many project outcomes is dependent on the existence of financial resources (e.g. upgrade of infrastructure to build new demonstrators/prototypes, workshops organisation with the industry, …) could regular donation requests. Mechanisms such as donations (e.g., the Wikipedia platform) could be one of the solutions.

- **Strengthening the collaboration between PC HEIs and industrial companies in Tunisia and Morocco:** The collaboration between these parties should be maintained. New collaborations have to be initiated. Highlighting Success stories and the use of services provided by the CC and DIH have the potential to guarantee a long-term collaboration and ensure diversity in needs identifications and therefore the need in updating project results (e.g. learning materials). The cooperation between HEIs and industrial companies will support the sustainability of some outcomes such as the DIHs and CCs. Through needs identification and requirement engineering, support in Gap Analysis, upskilling of PC industry staff and engagement of industrial partners in decision-making actions, PC HEIs staff will be able to generate new findings for updating the outcomes of the ENHANCE project (learning materials content, services, …).

- **Monitoring and Assessment techniques:** The partners recommend the use of assessment tools in order assess specific KPIs helping the selection and execution of specific strategy to guarantee the sustainability of project outcomes.

- **Strengthening the collaborations Tunisia-ENHANCE EU partners and Morocco-ENHANCE EU partners:** take profit from international mobility programmes (Erasmus+, DAAD, …) and promote the mobility of students registered the ENHANCE addressed topics (Maintenance, Production and Quality 4.0). There are several benefits from an academic mobility experience that can be expressed in the form of key criteria, such as participants in student exchange programmes, and can improve their employability on a personal level as well as their self-sufficiency and train their intercultural skills. Academic exchange programmes also serve as a platform for learning new and improving current foreign language skills and allow universities to share best practices and make the learning process more transparent.

The following table includes the results of the discussions between all the involved parties.

Table 1: ENHANCE outcomes, strategies and resources.

Project Outcomes	Strategy to ensure the sustainability of the project outcomes	Means of Verification	Resources to ensure the sustainability of the project outcomes	Where will these resources be obtained?
Developed learning materials	Integration of the new learning materials into existing courses during and after the project lifetime,	Developed learning materials are integrated into existing programmes	• Authorities/HEIs decision makers allowing the integration of the new learning materials into existing courses • Trained trainers for the Integration of the new developed learning materials into the existing courses	• PC HEIs, Authorities
	Adoption of the new learning materials as new courses during and after the project lifetime	Developed learning materials are adopted into existing programmes	• Authorities/HEIs decision makers allowing the adoption of the new learning materials as new courses • Trained trainers for the adoption of the new developed learning materials as new courses	• PC HEIs, Authorities
Trained trainers	Novel competencies, Acceptance to be trained and to improve own courses	Trainers have been trained	• Trainers, **Developed learning materials**	• PC HEIs • External experts
Trained administrative staff	Novel competencies, Acceptance to be trained and to improve own competencies	Administrative staff have been trained	• Trainers, **Developed learning materials**	• PC HEIs • External experts
Developed infrastructures (labs, demonstrators) using acquired equipment	Use and maintenance of the equipment for the implementation of the new learning materials during and after the project lifetime	Equipment is already integrated into existing infrastructures and used to execute the learning materials	• **Trained trainers** • Technical staff	• PC HEIs
Developed E-learning Platform	Integration, use, support and regularly update the content of the online learning platform after the project lifetime	Learning materials are available on the platform, platform is already used for the execution of lectures	• **Developed learning materials** • **Trained trainers** for updating the learning platform • Technical staff of the responsible project partners for maintaining the learning platform • **Trained administrative staff** using the learning platform content assessment activities	• PC HEIs
Created HEIs programmes	Integration and implementation in HEIs programme portfolio during and after the project lifetime Enrolment of Students	Enrolment of students for the new HEIs programmes	• **Trained trainers** • **Developed learning materials** • **Developed infrastructures** • Students (enrolment)	• PC HEIs
Training materials for industrial companies	Continuous training programmes for PC industrial partners after the project lifetime	Training materials have been used and to train industrial companies' staff	• **Created Competence Centres (CC)** • **Created Digital Innovation Hubs (DIH)** • Industrial staff • **Trained trainers** for executing the training	• Authorities • PC HEIs • Industrial partners
Mobility of students	Promotion and support of future student and academic mobility initiatives and mobility programmes after the project lifetime	Mobility of student is taken place	• **Trained administrative staff** for the management of future mobility programmes • EU Consortium Partners • PC Consortium Partners	• PC HEIs • Authorities • EU Commission • EU Partners
Findings for Policy makers/Authorities	Findings documentation and transfer. Workshops with policy makers and Authorities	Findings are transferred	• Contact persons	• PC HEIs • National and international authorities

Created project website and project accounts in social media	Support and periodic update the content of the project website and project accounts in social media during and after the project lifetime	Outcomes are updated and available for dissemination purposes	• Technical staff for maintaining the project website and project accounts in social media • **Trained administrative** staff for updating the project website and project accounts in social media	• PC HEIs and responsible project partners
Created Competence centres	Execution of offered CC activities after the project lifetime. CC activities integration in PC HEIs structures. Focus on specific topics. (e.g. region-oriented topic)	CC services are executed, services are used by interested partners	• Dissemination and communication materials (e.g. website, social accounts, flyers, YouTube videos, …) • Success Stories • Financial resources (Funding, donation, …) • Competencies (for knowledge transfer and consultancy)	• Industry • National authorities • Funding provider • CC manager • PC HEIs
Created Digital Innovation Hubs	Execution of offered DIH activities after the project lifetime. Continuous collaboration with national and international companies	DIH activities are executed, services are used by interested partners	• Dissemination and communication materials (e.g. website, social accounts, flyers, YouTube videos, …) • Success Stories • Financial resources (Funding, donation, …) • Competencies (for knowledge transfer and consultancy)	• Industry • National authorities • Funding provider • DIHs manager • PC HEIs
Established collaboration between PC HEIs and European partners	Continuing existing and creating new collaboration opportunities during and after the project lifetime	Student/staff mobility has been executed, research proposals have been submitted, Partners are working on EU funded projects	• EU Consortium Partners • PC Consortium Partners • EU Commission decision maker	• PC HEIs • EU Consortium Partners • EU Commission

4. Potential Sustainability barriers and related measures

This section presents the main barriers that could impede the progress of the ENHANCE project. To ensure the sustainability of results, the present section also discusses ways to address these barriers.

4.1. Funding opportunities

Funding from an Erasmus+ programme only covers the project's duration, i.e. ENHANCE project: starting from January 2021 until January 2024. **It is, therefore, necessary for the existing financial resources to be used efficiently both during the duration of the project and in the post-project period. Additionally, new funding schemes can be identified during the duration of the ENHANCE project as a way to further ensure the project's sustainability.**

4.2. Staff allocation and other resources

The staff associated with ENHANCE-specific activities is usually allocated to a different project or activity after the end of ENAHCE, meaning that the availability of staff is also limited. **Available staff and resources should be strategically and efficiently involved. For example, if the partner organisation has a monthly or bimonthly newsletter through which it can continue to disseminate the project's results, it could do so without significant additional staff, execution or administrative costs. Likewise, if the partner employs a certain number of staff for the execution of EU-funded projects related to capacity building, it may be possible to integrate or use the results of the ENHANCE in the scope of this project. This will ensure that the results of the ENHANCE project will be sustained both during and after the end of the project.**

4.3. Organisation and Communication

Communication between partners and key stakeholders can easily be lost and often becomes less frequent after the project's completion. This is often the case since after the end of the funding period, the involved individuals have less and limited time to spend on activities related to the project and its foreseen activities have been completed. **It is important to create opportunities in order to continue the established relationships and to further expand them and share new ideas. Organization and communication are therefore both important to the sustainability of the results.**

4.4. Time management

Limited time is a major issue since by the end of the project, the staff associated with ENHANCE activities are no longer available to spent time on associated tasks and are allocated to a different project or have other responsibilities. In the case that the partner does have the capacity to occur a certain number of hours for the ENHANCE project, the time available will be in any case limited and activities such as keeping the project's website updated may become a challenge. **In the case that there is time for the activities it is best to spend it on the activities which will provide the highest added value.** From the stakeholders' perspective, time issues are also important in the sense that there may be limited possibilities to participate in the dissemination process outside the project's official scope and to contribute further to sustaining the results.

4.5. Interest and motivation

It is sometimes the case that the partners and the regional stakeholders may lose interest after the project's completion, particularly in the case that the immediate effects of the project have been achieved on a policy level. This is less likely to be the case if the project has developed high quality outputs, and strong networks, thereby **maintaining their interest and motivation to further disseminate project results.**

4.6. Other potential difficulties

Complex and time consuming administrative and bureaucratic procedures in certain partner countries can also be a significant barrier to the implementation of the sustainability plan. This phenomenon is often more strongly present on a regional and peripheral level in the PC. Overcoming the above obstacles can be a challenging process particularly with the lack of financial resources; however, **it is essential that potential, negative effects are minimized to achieve the maximum results from the project in the long run.**

5. Sustainability actions

5.1. Initial sustainability actions

5.1.1. ENHANCE contribution to new master programmes creation.

- **Master programme « Industry 4.0 » in IIT-Sfax/Tunisia:** The project partner IIT from Tunisia has developed a new master titled "industry 4.0" (see Figure 2). IIT organized a seminar to present their new master on October 13th, 2021.

Figure 2: Flyer and programme of seminar of the presentation of the new master industry 4.0 of IIT.

- **Master programme «Industrie Intelligente et Technologie numérique» in UIT-Kenitra /Morocco:** The project partner UIT (ENSAK) from Morocco has created a new master programme in the frame of the ENHANCE project. The master program, called «Industrie Intelligente et Technologie numérique» has been accredited by the education HEM and fully managed by the ENSAK (UIT) (see Figure 3). The programme was launched in October 2021.

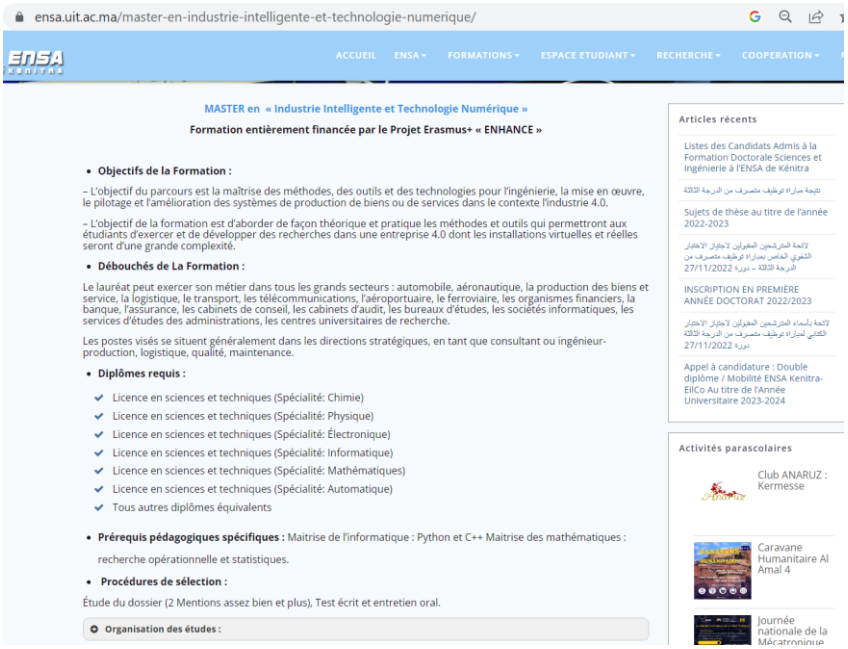

Figure 3: UIT Master program.

5.1.2. Successful participation of industrial stakeholders

- **Contribution to Gap Analysis, Needs identification:** The objective of this online workshop, organized on July 07th 2021, is to collect data for the task T1.2 which focus on identifying gaps between targeted MPQ4.0 skills (see D1.1) and needs of Tunisian and Moroccan industry (link of the workshop: https://eplus-enhance.eu/index.php/1st-enhance-industrial-workshop-2021/).

Invitations were sent to both Tunisian and Moroccan SMEs (see Figure 4). During the workshop, and even after, a survey with 20 questions was sent to SMEs to collect data. The link of the survey is: https://enquetes.univ-lyon2.fr/index.php/919576. In addition to the dissemination of ENHANCE, the participants, mainly from industrial sectors, have contributed to the gap analysis. The 32 industrial companies (19 from Tunisia and 13 from Morocco, see Figure 6) have answered a questionnaire dealing with:

- existing MPQ practices in their facilities,
- existing digitalisation projects related to MPQ4.0,
- their interest in digital transformation projects related to MPQ 4.0,
- the ability of employees to lead a transformation project to MPQ 4.0 and
- the contribution of the ENHANCE project for the creation of new MPQ4.0.

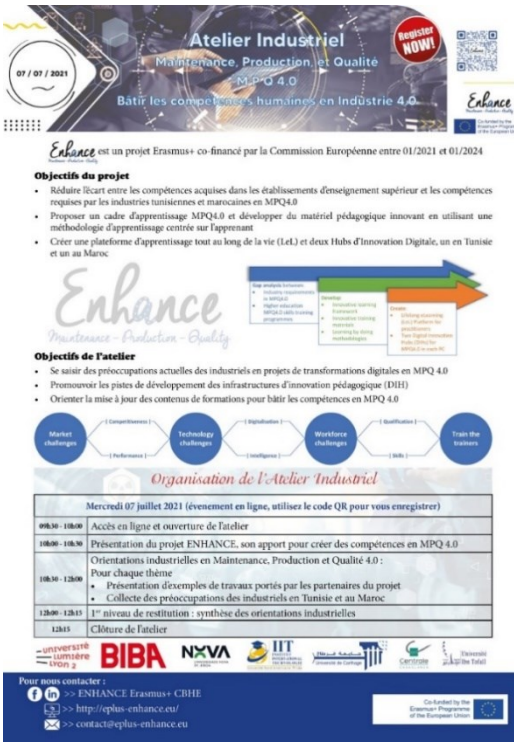

Figure 4: First industrial workshop flyer

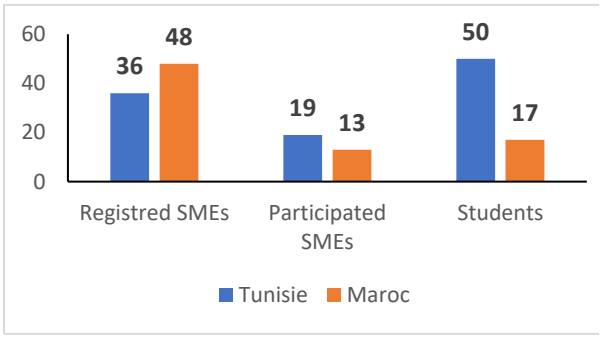

Figure 5: Participants to the online workshop

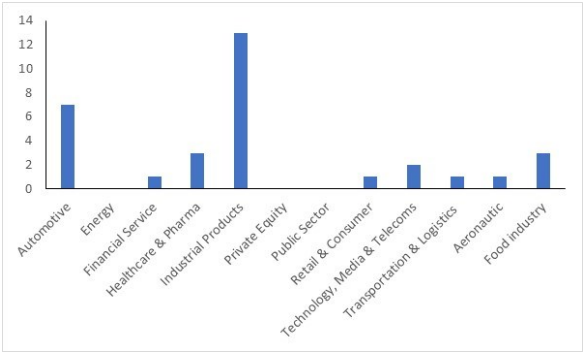

Figure 6: Number of companies classified by industrial sectors

- **Participation to physical Workshops:** Several workshops have been organized to get more understanding about their concerns and needs.

During a workshop in Kenitra/Morocco, organized on March 11th, 2022 in UIT (Université Ibn Toufail) different talks were related to the digital transformation in the industry 4.0 era in Morocco and how local and international organizations and higher education institutions can support the effort of local authorities to achieve this objective. A

Figure 7: Panel of the workshop in UIT-Kenitra.

panel (see Figure 7) has been also organized in this workshop in which both professors and industrials (see Figure 8) were invited to discuss the challenges related to Maintenance 4.0, Production 4.0 and Quality 4.0.

Entreprises participantes :

- PSA
- AGC AUTOMOTIVE
- LEAR CORPORATION
- SIMOLDES PLASTICOS
- FAURECIA AUTOMOTIVE
- PROMA INDUSTRIE
- HIRSCHMANN
- MTA AUTOMOTIVE
- CENTRALE DANONE

Invitations :

- Métiers de l'industrie (ingénierie, qualité, production, maintenance)
- Universitaires chercheurs impliqués dans l'industrie 4.0
- Directeurs recherche et développement des entreprises
- Cabinets de conseil en ERP
- Industriels : Équipementiers, fournitures industrielles, logistique industrielle, ingénierie, Facility Management, outillage, organismes, machines spéciales
- Doctorants
- Élèves ingénieurs

Figure 8: Invited industrial partners and target groups – Workshop in Kenitra.

In Sfax, the economic capital of Tunisia, a workshop (see Figure 9) has been organized by IIT on May 25th, 2022. In this workshop, 60 industrial representatives, 46 teachers, 397 Students and 12 other participants were present. During this workshop, several talks were given, in which industrial partners have stressed interesting challenges and communicated their interest in supporting the success of the project ENHANCE.

A fourth industrial workshop took place on December 19th, 2022, in Hammamet (Tunisia) at the University of Carthage (Tunisia). The title of the workshop was "Contribution of the ERASMUS+ programme to the development of industry 4.0 in Tunisian universities". This workshop (see Figure 10) was co-organized with three other ERASMUS+ CBHE projects (NEPREV, SMTMC and MSCPS). More than 70 participants (professors, industrials, and students) were present.

Figure 9: Flyer of the Seminar "Industrie 4.0, une réalité qui s'impose " in Sfax.

Figure 10: Flyer of the fourth ENHACNE industrial workshop in Hammamet.

- **Co-creation of successful Industrial Training:** The intentions of the consortium within all the workshops and talks organized in Tunisia and Morocco were to disseminate the project

outcomes (as a sustainability mechanism), motivate SMEs to co-create the success of ENHANCE and contribute to its sustainability. The successful participation of industrial staffs to the additional industrial training sessions (in ECC, UIT, IIT and UCAR) proves the evidence of the sustainability strategy mechanisms that the consortium partners have worked on.

5.1.3. Student Mobility and knowledge transfer actions

During the implementation of the three pilots (T2.2, T2.3, and T2.4), south-south student mobility was planned between PC partners. The primary objective of this mobility is to maximize the impact of the trainings related to the three pilots. By enabling students from different southern regions to participate in these mobility programmes, the aim is to enhance key skills, facilitate the transfer of knowledge related to MQP4.0, and encourage the practical application of concepts addressed in these three pilots.

- From IIT (Tunisia) to UIT (Morocco): From the Institut International de Technologie (IIT), four students were selected in the mobility. During their stay for two weeks, students from IIT participated in the activities of the master of “industrie intelligente et technologie numérique” (IIT) and industrial visits
- From UIT (Morocco) to IIT (Tunisia): From University Ibn Todail (UIT), four students were selected in the mobility to Institut International de Technologie (Sfax). During their stay for two weeks, students from UIT visited many industrials companies from the region of Sfax, participated in training activities in IIT and participated in many cultural activities organized by IIT.
- From UCAR (Tunisia) to ECC (Morocco): From the University of Carthage three students travelled to Ecole Centrale Casablanca (ECC) for two weeks. During their stay, students participated in the different activities of the spring school co-organized by ENHANCE and Ecole Centrale Casablanca. They also worked with Moroccan students in the different activities of the Fablab of ECC.

5.2. Further sustainability actions

The main sustainability objective of the ENHANCE project is to continue to exploit the results and other resources of the project beyond the project lifetime.

- Use of the outcomes: The developed and updated outcomes, the training materials, will be used by the DIHs for the execution of specific services such as consultancy, training, and upskilling. The project members in PC will ensure the dissemination of the project outcomes through the activities of their DIHs.
- Working out additional mechanisms (e.g. DIHs services) for other PC universities to facilitate the collaboration with PC universities on outcomes delivered by ENHANCE. The project members in PC will ensure the dissemination of the project outcomes through the activities of their DIHs.
- Update of the outcomes: The partners will update the outcomes, mainly the learning materials, based upon the feedback from trained trainers. This process will be performed iteratively.
- Dissemination: the partners are working on a dissemination concept/plan after the project's lifetime. For sustainability purposes, the outcomes of ENHANCE should be broadcast to other potential stakeholders not only in Tunisia and Morocco but also in other Erasmus+ partner countries.
- Training sessions with other HEIs in Tunisia and Morocco (not consortium partners) could be organised in February and May 2024 to disseminate about the project outcomes.

6. Conclusion

The sustainability assurance plan proposed a sustainability approach adapted to the ENHANCE project outcomes. Sustainability barriers and related measures are defined and considered during the project lifetime. Concreate sustainability actions were developed around the 8 existing training programmes, the new created master programmes, the implication of industrial stakeholders in the definition of training activities priorities at the earlier stages of the project, and finally, the students mobilities to connect with the different adapted training programmes empowered with the new teaching equipment purchased during the ENHANCE project.