



**SMA
CITE**

Enhancing skills
for smart city tech

SMACITE

Boosting the technical
and non-technical skills
and competences
of smart cities technicians
and engineers

**WP1: Project management and
coordination**

D1.4: Project Final Report

Final version



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DELIVERABLE FACTSHEET

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PROJECT SUMMARY

The project aims to address the skills gap of Smart Cities technicians and engineers, by designing and testing a vocational education and training program that is based on a novel and multi-disciplinary curriculum combining digital skills on Smart Cities enabling technologies, with soft, entrepreneurship and green skills.

The expected project outputs are:

- A Smart Cities competences map and ESCO-compliant Smart Cities job profiles.
- A Smart Cities curriculum combining both technical and non-technical skills and competences and promoting personalized learning pathways.
- Learning resources for Smart Cities enabling technologies and for building the soft, entrepreneurship and green skills of Smart Cities technicians and Engineers.
- A diagnostic tool to identify personalized learning pathways.
- A MOOC for Smart Cities enabling technologies.
- Virtual Worlds for building the soft, green and entrepreneurship skills of Smart Cities technicians and engineers.

The main project beneficiaries are Smart Cities technician and engineers either from the public sector (i.e. municipalities) or enterprises providing Smart Cities solutions, as well as HEI and VET students interested in Smart Cities.

The curriculum will be tested through 4 national pilots in Greece, Bulgaria, Spain and Italy with at least 160 trainees. The certification of the skills and competences will follow a two-fold approach: (a) using micro-credentials to recognize the knowledge and skills gained through the successful completion of each online training module at the MOOC and Virtual Worlds and (b) designing the “Smart Cities Specialization Certification” that will be awarded to those passing online certifications exams with e-proctoring after the completion of the training modules.

The project will create an ecosystem for the co-design and co-development of an innovative curriculum and technology-enhanced learning tools for the upskilling/reskilling of Smart Cities technicians and engineers.

1 Introduction

This deliverable is a public report that presents (i) the SMACITE project objectives and approach for addressing the skills gap at the Smart Cities domain, (ii) the project progress and the challenges faced through its lifetime, (ii) the main outputs produced and (iv) the project impact at relevant stakeholders.

1.1 Structure of the deliverable

This deliverable is divided into 7 main Sections.

- **Section 1** introduces the deliverable. Section 1.1 describes the structure of the deliverable, Section 1.2 outlines the target audience and Section 1.3 describes the dependencies with other WPs and deliverables.
- **Section 2** describes the SMACITE project.
- **Section 3** discusses the project's objectives and approach.
- **Section 4** describes the project progress through its 3 years implementation and the challenges faced.
- **Section 5** discusses the project results.
- **Section 6** discusses the project impact on the diverse stakeholders.
- Finally, **Section 7** concludes the report.

1.2 Target audience

The target audience of the deliverable includes the following stakeholders:

- The SMACITE participating organizations.
- Any other stakeholder that is interested in SMACITE project development and progress.

1.3 Dependencies with other WPs and deliverables

Deliverable D1.4 has direct connections with all deliverables produced under WP2, 3, 4, 5, 6 and 7.

2 The SMACITE project

The “SMACITE: Boosting the technical and non-technical skills and competences of Smart Cities technicians and engineers” project, is a 3 years Erasmus+ project (duration: 01/06/2022 – 31/05/2025) that aims to address the skills gap of Smart Cities technicians and engineers, by designing and testing a vocational education and training program which is based on a novel and multi-disciplinary curriculum combining digital skills on Smart Cities enabling technologies, with soft, entrepreneurship and green skills.

The project brings together diverse organisations from academia, VET, industry and the public sector from 5 European countries (Greece, Bulgaria, Italy, Spain and Belgium).



Figure 1: The SMACITE partnership

The project workplan includes 7 Work Packages. WP1 that concerns project management and coordination, WP6 that concerns quality assurance, risk management and project evaluation and WP7 that concerns impact, dissemination and exploitation are horizontal Work Packages that run during the entire lifecycle of the project.

The project core developments were done under 4 WPs:

- a) WP2, under which were developed the Smart Cities competences map and emerging job profiles, as well as the SMACITE curriculum and the training and certification framework of the training program.
- b) WP3, under which were developed the learning resources for the upskilling/reskilling of Smart Cities technicians and engineers, i.e. learning resources for Smart Cities enabling technologies, and for building soft, entrepreneurship and green skills.
- c) WP4, under which were developed a diagnostic tool for identifying personalized learning pathways through the curriculum (and where applicable and relevant through external courses of third-party providers), as well as the MOOC and Virtual Worlds for the upskilling/reskilling of Smart Cities technicians and engineers.
- d) WP5, under which the SMACITE training program was piloted.

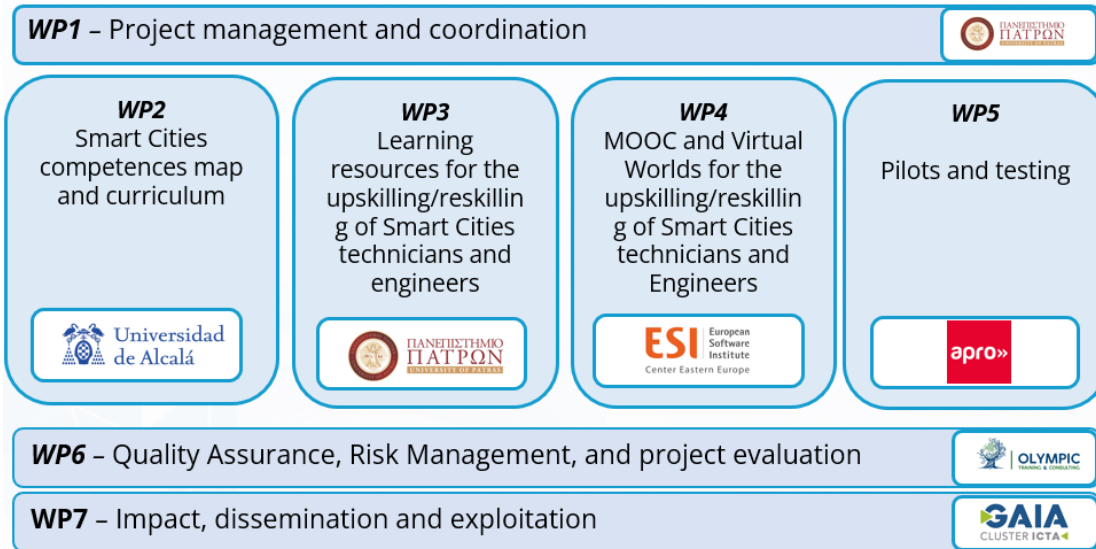


Figure 2: SMACITE workplan

The fact sheet of the project is provided below.

- **Program:** Erasmus+
- **Call:** Partnerships for Innovation – Alliances / Alliances for Education and Enterprises (ERASMUS-EDU-2021-PI-ALL-INNO)
- **Project Number:** 101052513
- **Project Coordinator:** University of Patras, Greece
- **Duration:** 36 months
- **Number of partners:** 12
- **Project budget:** €1.675.545
- **Maximum EC contribution:** 1,340,436 €
- **Funding model:** lump sum (80% EC co-financing)
- **Start Date:** 01/06/2022
- **End Date:** 31/05/2025

3 Project objectives and approach for addressing the skills gap at Smart Cities domain

3.1 Project rationale and objectives

By 2050, two-thirds of the world's population will live in cities, consuming over 70% of energy and emitting an equal share of greenhouse gases. This urban growth increases demand for essential services and resources. Smart Cities use advanced technologies like AI, IoT, and Cloud Computing to improve quality of life, sustainability, and efficiency. The global Smart City market is expected to grow significantly, driven by rising urban populations and government initiatives, including the EU's Green Deal.

However, a major barrier to Smart City development is a shortage of skilled professionals. A lack of digital expertise, in areas such as data analytics and IoT, affects both public and private organizations. Additionally, Smart Cities require not only technical skills but also soft skills such as problem-solving, communication, leadership, together with entrepreneurial skills. Green skills are also essential for tackling the environmental challenges that cities are facing today.

While extensive educational programs exist for digital technologies, there is a gap in specialized Smart City training that integrates both technical and non-technical skills. The SMACITE project aims to address this skills shortage through collaborative efforts between education providers, the industry, and the public sector, ensuring the workforce is equipped with the necessary skills for building sustainable Smart Cities.

The key objectives of the SMACITE project are the following:

- To define the emerging job profiles of “Smart Cities Technician” and “Smart Cities Engineer” in line with ESCO and eCF.
- To design a Smart Cities multi-disciplinary and learning outcomes-oriented curriculum addressing the learning needs for Smart Cities Technicians and Smart Cities Engineers.
- To develop the learning resources of the curriculum.
- To design a diagnostic tool to identify the training needs of Smart Cities Technicians and Engineers and propose flexible and personalized learning pathways.
- To develop a MOOC for the upskilling/reskilling at Smart Cities enabling technologies (e.g. Internet of Things, Cloud Computing, Big Data).
- To develop a Virtual Worlds platform for the upskilling/reskilling at soft, entrepreneurial and green skills.
- To design a certification scheme to verify learners' skills.
- To pilot the curriculum with Smart Cities Technicians and Engineers from Greece, Bulgaria, Italy, and Spain.

3.2 Project approach

To efficiently achieve the aforementioned objectives, we adopted an approach consisting of 5 core stages. These stages cover the identification of Smart Cities competences, curriculum development, learning resources creation, training through innovative platforms and project evaluation.

Stage 1: Defining Smart Cities Competences, Job Profiles, and Curriculum

The first stage was focused on identifying the skills, knowledge, and competences for Smart Cities Technicians and Engineers. This involved developing a Smart Cities competences map based on desk research, an online survey engaging key stakeholders from academia, industry and public organizations, as well as interviews with Smart Cities experts. Based on the competences map, the emerging job profiles of the "Smart Cities Technician" and "Smart Cities Engineer" have been identified.

Following this, the SMACITE curriculum has been developed to build both technical and non-technical competences necessary for technicians and engineers in the Smart Cities sector. The curriculum included diverse courses structured in training modules and integrated methodologies for assessment and certification to ensure learners acquire and validate their skills effectively.

Stage 2: Developing Learning Resources for Upskilling/Reskilling

In this stage, diverse learning resources have been developed to provide flexible and accessible training for Smart Cities technicians and engineers. These resources were designed for micro-learning and were accessible both on desktops and mobile devices. The types of learning resources developed are self-study resources (texts, short videos, and presentations), evaluation quizzes to test the students their knowledge and progress, and real-life case studies/projects to enhance problem-solving and practical application skills.

Stage 3: Development of MOOC and Virtual Worlds

The third stage involved the creation of the Massive Open Online Course (MOOC) platform and Virtual Worlds for online training. The process begun with the development of a diagnostic tool to assess each learner's training needs and offer personalized learning pathways through the curriculum's courses. The MOOC provided foundational training on Smart Cities enabling technologies, e.g. Internet of Things, Cybersecurity, Cloud Computing and Machine Learning. Additionally, 3 Virtual Worlds have been developed to facilitate training in soft skills, entrepreneurial skills, and green skills, which are essential for Smart Cities professionals.

Stage 4: Evaluating the SMACITE Training Program

This stage was focused on assessing the effectiveness of the SMACITE training program through pilot programs conducted in various countries including Greece, Bulgaria, Spain, and Italy. The pilots involved professionals from the public sector and the industry, as well

as HEI and VET students. Prior to the pilots, a Train-the-Trainers event took place, along with the development of a Trainer Handbook to support trainers.

Stage 5: Evaluating Project Impact and Ensuring Sustainability

The final stage aimed to assess the project impact and design a plan for the sustainability and exploitation of the project results. Specifically, a Project Exploitation and Sustainability Guide has been developed to a) Support target groups in utilizing and adapting project outputs to different contexts, b) Define business models, funding options, and sustainability strategies to ensure long-term benefits beyond the project's end, and c) Address Intellectual Property Rights (IPR) issues related to the project outputs.

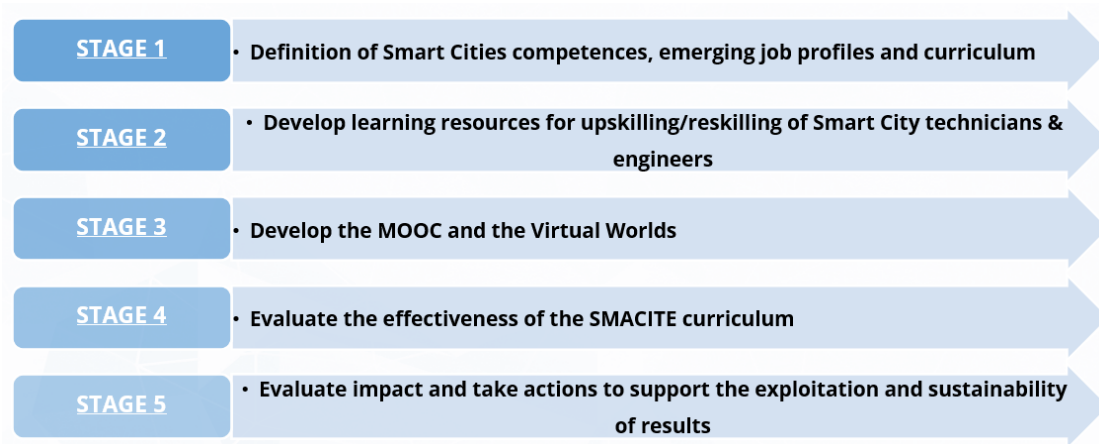


Figure 3: Project approach

4 Project progress and challenges faced through its lifetime

The SMACITE project embarked on its journey in June 2022, with a vision to shape the future of smart cities training. With the foundations laid, the SMACITE partnership set out to map the skills needed for emerging roles in the evolving urban landscape such as Smart Cities Technician and Smart Cities Engineer. By October 2022, the project reached its first milestone: defining ESCO-compliant job profiles tailored for Smart Cities. This was a critical step, ensuring the relevance and applicability of Smart Cities roles in the European context. Around the same time, the first version of the SMACITE curriculum was introduced—laying the educational groundwork of the training program. Once the 1st version of the curriculum has been designed the partners started working on the development of the learning resources of each course.

In March 2023, a diagnostic tool was developed to help learners identify personalized training paths through the SMACITE curriculum. This step shifted the project into a learner-centric mode, ensuring that training would be tailored to individual needs. By October 2023, the 1st version of the learning resources has been developed through refinement and internal review by the SMACITE partners, while by November of the same year the MOOC for Smart Cities was ready. Another key component of the SMACITE training platform, i.e. the Virtual Worlds for soft, entrepreneurial, and green skills training -that brought a new level of interactivity and immersion- was ready for testing in January 2024.

The next 10 months of the project (i.e. February 2024 – November 2024) were focused on the piloting activities. Real-world testing of the curriculum, learning resources and training platforms has taken place with stakeholders from the academia, VET, industry and public sector offering vital feedback and insights to shape the final edition of the project key results (i.e. curriculum, learning resources, MOOC and Virtual Worlds). Finally, the last 3 months of the project were focused on measuring the project impact, organizing the project final conference, and developing the project sustainability and exploitation guide.

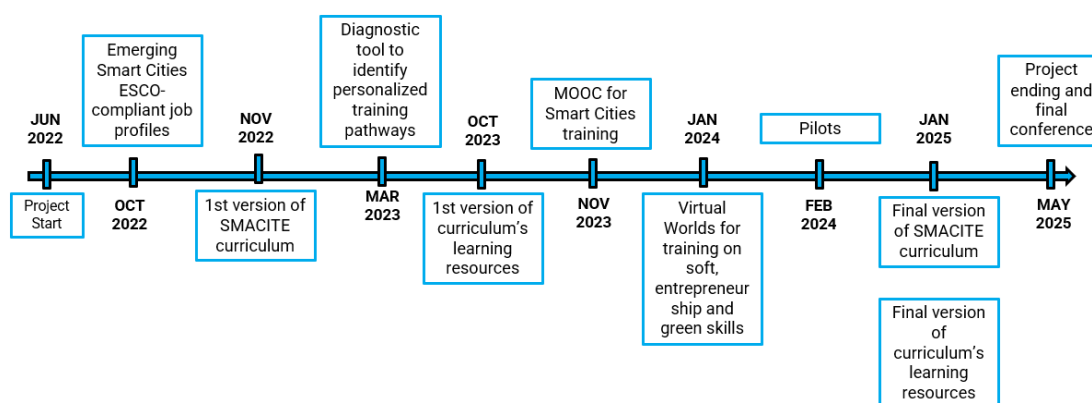


Figure 4: Project progress

Below we present the key challenges we faced during the project and mitigation measures taken.

Challenges	Mitigation measures
<u>Skills Mapping Complexity</u> Aligning job profiles with ESCO and future labour demands across different countries proved complex.	Engaged sector experts early. Conducted iterative validation rounds through an online survey and interviews with experts.
<u>Curriculum Adaptability Across Learners</u> Variations in the training needs of diverse learners.	Designed modular, flexible learning units. Offered personalized learning paths supported by the diagnostic tool.
<u>Technology Integration for Virtual Worlds and MOOCs</u> Ensuring robust technical implementation and accessibility.	Collaborated with experienced edtech developers. Conducted usability testing with diverse learners prior the launch of pilots.
<u>Stakeholder Engagement in Pilots</u> Maintaining consistent participation of learners.	Incentivized stakeholder involvement. Launched SMACITE awards

5 Project results

This section discusses the results of the SMACITE project

Smart Cities Technician and Smart Cities Engineer job profiles

We identified the emerging job profiles of the “[Smart Cities Technician](#)” and “[Smart Cities Engineer](#)” based on the following approach:

- Initially, preliminary research was performed aiming to analyse the state of the art and the current approach to smart city profiles and defining the project’s approach for further steps.
- Then, desk research was conducted aiming to identify relevant skills of the smart cities’ profiles in ESCO, e-CF, and other relevant references in the field.
- The previous steps were complemented by an online survey aiming to reach stakeholders and confirm the appropriateness of the competences, functions, knowledge, and skills extracted from the desk research. The online survey collected 134 full responses from 11 European countries - although countries with more contributions were Spain (34.07%), Bulgaria (27.41%), Greece (16.30%) and Italy (13.33%).
- Based on the results that came out from the previous steps two profiles have been developed aligned to ESCO and e-CF, one for Smart City Engineer and another for Smart City technician.
- Finally, interviews with 5 experts in the domain of Smart Cities have been conducted with the aim of obtaining qualitative feedback and assistance in interpreting the data and results derived from the desk research and the stakeholder survey. The experts were also asked to confirm whether the profiles were appropriate and relevant in terms of their experience in Smart Cities.

For more information, please refer to the deliverable **D2.1: Smart Cities competences map and emerging job profiles**.

SMACITE curriculum

The SMACITE curriculum is composed of a) 10 technical courses on Smart Cities Enabling technologies, (i.e. Smart Cities, Internet of Things, Cybersecurity, Cloud Computing, Data analytics and visualizations, Machine Learning with Big Data, 3D printing, Blockchain, Drones and Autonomous Vehicles) and b) 3 non-technical courses on horizontal skills development (soft skills, entrepreneurship skills, and green skills).

It has been developed based on the ADDIE model, that is a flexible, systematic process used by instructional designers and training developers to break down the training development process into actionable steps and create effective learning experiences. The key characteristics of the SMACITE curriculum are 3: multidisciplinary, modular and flexible. Each course is divided into learning units (or modules) allowing students to build their own personalized learning pathways based on their needs and the outcomes of the diagnostic tool, thus promoting student-centerer learning.

For more information, please refer to the deliverable **D2.2: The SMACITE curriculum for Smart Cities**.

Training and assessment methodology

The training and assessment methodology provides a structured approach to the development and delivery of the SMACITE training program. The methodology ensures that the SMACITE curriculum is delivered in a consistent and effective manner, and that the learning outcomes are assessed according to established standards. The training methodology integrates online asynchronous training through MOOC on Smart Cities enabling technologies and horizontal skills, as well as online synchronous training on horizontal skills building through Virtual Worlds. The assessment methodology consists of two main components: formative assessment and summative assessment. Formative assessment is conducted throughout the training program, providing learners with regular feedback on their progress and identifying areas for improvement. Formative assessment is conducted through online quizzes, practical exercises, and group discussions. Summative assessment is conducted at the end of each course and is used to determine whether learners have achieved the learning outcomes of the course. Summative assessment is conducted through online certification exams with e-proctoring.

For more information, please refer to the deliverable **D2.3: Methodology for learners' training and assessment**.

Certification methodology

The certification methodology describes the process for the development of the certification scheme of learners' knowledge, skills and competences. In the framework of the SMACITE project 2 Certifications were developed: (a) SMACITE Certification for Engineers with Technical Specialization and (b) SMACITE Certification for Technicians with Technical Specialization. The design of the certification methodology includes the following steps: (1) Application for new scheme, (2) Application review, (3) Development of certification scheme regulations, (4) Syllabus control, (5) Developing Questions, (6) Review and Check Questions, (7) Pilot exams and (8) Application to the national accreditation system - Accreditation of a new subject.

For more information, please refer to the deliverable **D2.4: Methodology for the certification of competences of Smart Cities technicians and engineers**.

Learning resources for Smart Cities key enabling technologies

In total, 173 Open Educational Resources (48 documents, 66 presentations, 49 videos and 10 projects) for Smart Cities key enabling technologies have been developed and they are available at this [link](#). Those learning resources cover the following courses:

- **Smart Cities**. The learning resources cover the following 4 modules of the course:
 - Module 1: Introduction to the Concept of Smart Cities
 - Module 2: Case of Success
 - Module 3: Technological Solutions for Smart Cities

- Module 4: Planning and Deployment of Smart Cities Solutions
- **Internet of Things.** The learning resources cover the following 4 modules of the course:
 - Module 1: Introduction to IoT
 - Module 2: IoT Devices
 - Module 3: IoT Communications
 - Module 4: IoT Cloud
- **Cybersecurity.** The learning resources cover the following 6 modules of the course:
 - Module 1: Introduction to Cybersecurity in Smart Cities
 - Module 2: Cyberthreats and Attacks
 - Module 3: Cybersecurity Measures
 - Module 4: Cybersecurity Tools and Techniques
 - Module 5: Monitoring a Smart City
 - Module 6: Risk Management
- **Cloud computing.** The learning resources cover the following 6 modules of the course:
 - Module 1: Introduction to Cloud Computing
 - Module 2: Cloud Computing Infrastructure
 - Module 3: Deployment of Cloud Computing solutions
 - Module 4: Hyperscalers: Amazon Web Services, Microsoft Azure, and Google Cloud Platform,
 - Module 5: Introduction to software development and deployment for Cloud Computing
 - Module 6: New technologies applied to Cloud Computing
- **Data analytics and visualizations.** The learning resources cover the following 4 modules of the course:
 - Module 1: Introduction to Data Analytics and Data Visualization
 - Module 2: Data Analytics for Smart Cities
 - Module 3: Data Visualization for Smart Cities
 - Module 4: Smart Cities Use Cases
- **Machine Learning with Big Data.** The learning resources cover the following 4 modules of the course:
 - Module 1: Introduction to Machine Learning and Big Data
 - Module 2: Machine Learning for Smart Cities
 - Module 3: Machine Learning Case Studies for Smart Cities
 - Module 4: Machine Learning, IoT, and Cloud Computing
- **3D printing.** The learning resources cover the following 4 modules of the course:
 - Module 1: Introduction to 3D Technologies
 - Module 2: 3D design
 - Module 3: 3D Printing
 - Module 4: Applications of 3D printing in Smart cities
- **Blockchain.** The learning resources cover the following 8 modules of the course:
 - Module 1: Blockchain Architecture

- Module 2: Blockchain Technology
- Module 3: Cryptography
- Module 4: Data Structures in Blockchain
- Module 5: Smart Contracts
- Module 6: Web Development
- Module 7: Programming for Blockchain
- Module 8: Blockchain Applications for Smart Cities
- **Drones.** The learning resources cover the following 4 modules of the course:
 - Module 1: Introduction, Historical Review and Types of UAVs
 - Module 2: Drone Technology
 - Module 3: Drone Applications
 - Module 4: Drone Applications in Smart Cities
- **Autonomous Vehicles.** The learning resources cover the following 4 modules of the course:
 - Module 1: Introduction and historical review to Autonomous Cars (Week 1)
 - Module 2: Technology of Autonomous Cars (Week 2)
 - Module 3: Requirements of Autonomous Vehicles (Week 3)
 - Module 4: Open Challenges

For more information, please refer to the deliverable **D3.1: Learning resources for Smart Cities key enabling technologies.**

Learning resources for soft skills development

In total, 16 Open Educational Resources (6 documents, 6 presentations and 4 videos) have been developed and they are available at this [link](#). Those learning resources cover the following topics:

- Module 1: Introduction
- Module 2: Interpersonal communication
- Module 3: Teamwork and collaboration
- Module 4: Critical thinking and problem solving
- Module 5: Leadership and management
- Module 6: Managing through change

For more information, please refer to the deliverable **D3.2: Learning resources for soft skills development.**

Learning resources for entrepreneurship skills development

In total, 15 Open Educational Resources (7 documents, 4 presentations and 4 videos) have been developed and they are available at this [link](#). Those learning resources cover the following topics:

- Module 1: Introduction to Smart Cities and Entrepreneurship for Engineers
- Module 2: Identifying opportunities in Smart Cities
- Module 3: Developing Entrepreneurial Mindset and Skills

- Module 4: Technology Integration and Innovation
- Module 5: Funding, growth and implementation
- Module 6: Practical Implementation and action planning - business plan
- Module 7: Interdisciplinary collaboration

For more information, please refer to the deliverable **D3.3: Learning resources for entrepreneurship skills development.**

Learning resources for green skills development

In total 14 Open Educational Resources (3 documents, 5 presentations, 5 videos and 1 project) have been developed and they are available at this [link](#). Those learning resources cover the following topics:

- Module 1: Apply the Circular Economy concept
- Module 2: Energy Conservation
- Module 3: Waste Management

For more information, please refer to the deliverable **D3.4: Learning resources for green skills development.**

Diagnostic tool to identify the training needs of Smart Cities technicians and engineers

The diagnostic tool is an online self-assessment guide utilized by ICT professionals to pinpoint the training courses requirements for following a career as Smart Cities technicians and engineers. The tool informs a tailored learning path for each SMACITE course based on learners' prior knowledge, skills, and competencies. The tool has two objectives. The first objective is to increase awareness of the Smart Cities technicians and engineers profiles and target competencies by describing the SMACITE training program's contents, while providing access to the MOOC and getting users familiar with the training platform. The second objective is to suggest personalization of learning paths within SMACITE courses based on self-evaluation of learners' prior knowledge and skills. The diagnostic tool is available through the following links of the SMACITE MOOC (a) [Diagnostic tool for Smart Cities Engineers](#) and (b) [Diagnostic tool for Smart Cities Technicians](#) and contributes to the overall project goal by addressing the skills gap of Smart Cities technicians and engineers through personalised education and training.

For more information, please refer to the deliverable **D4.1: Diagnostic tool to identify the training needs of Smart Cities technicians and engineers.**

MOOC for Smart Cities

The SMACITE MOOC is running at <https://mooc.smacite.eu/> and provides 10 technical courses on Smart Cities enabling technologies, as well as 3 courses on horizontal skills development for Smart Cities engineers and technicians. The access to the MOOC is free to anyone interested in Smart Cities technologies and horizontal skills development. After careful consideration, Bitnami LMS powered by Moodle™ (an open-source well-known

learning management system) on Amazon Web Services (AWS) was chosen as the preferred hosting solution. This decision was influenced by several critical factors that aligned with the project's objectives and operational requirements, i.e. Security and Compliance, Cost-Effectiveness, Deployment Speed and Operational Efficiency, High Availability and Disaster Recovery and Maintenance and Support.

For more information, please refer to the deliverable **D4.2: MOOC for Smart Cities**.

Virtual Worlds for training on soft, entrepreneurship and green skills

In addition to the MOOC, the SMACITE training platform revolves around three immersive Virtual Worlds aimed at fostering the soft, entrepreneurial, and green skills of Smart Cities technicians and engineers. These Virtual Worlds offer an engaging training environment, integrating 3D infrastructures, avatars, real time voice interaction between participants and on demand training materials loading. The system is designed to be user-friendly for both trainers and trainees. Trainers in a backend system (<http://vr-admin.smacite.eu/>), similar to those used for managing online meetings (e.g. Zoom), can organize sessions, add participants in each session, upload training materials, and select the specific virtual world in which each session will take place. To access the Virtual Worlds, both trainers and trainees have to download the Windows executable from this [URL](#), unzip the file and run the executable "Smacite.exe".

For more information, please refer to the deliverable **D4.3: Virtual Worlds for training on soft, entrepreneurship and green skills**.

SMACITE pilots plan

The SMACITE pilots plan aims to provide basic guidelines and support the partnership and piloting partners to carry out a strategic, fruitful testing of the SMACITE training program. This testing allows the partnership to draw conclusions and make decisions for further development and improvements of the integral SMACITE curriculum. The pilots plan includes the preparatory actions that took place prior the implementation of the pilots, the actions that took place during the implementation of the pilots, as well as the actions that took place after the implementation of the pilots.

For more information, please refer to the deliverable **D5.1: SMACITE pilots plan**.

Trainer handbook

The trainer handbook aims to provide the basic guidelines for trainers participating in the piloting activities of the SMACITE training program. Moreover, it serves as a guide for trainers interested in exploiting the SMACITE training program after the end of the project. More specifically, the trainer handbook provides an overview of the entire curriculum and the main features of the MOOC, and the Virtual Worlds from the trainer's point of view.

For more information, please refer to the deliverable **D5.2: Trainer handbook**.

SMACITE pilots report

The pilots run from March 2024 up to November 2024, into 3 phases: (1) From February to October 2024: piloting of technical courses on the MOOC, (2) From April to October 2024: piloting of non-technical courses on the MOOC and on the Virtual Worlds and (3) From September to November 2024: piloting of the certification procedure and the issuing of certificates. Although initially 407 individuals have expressed interest to join the SMACITE pilot training through an [open call](#), 331 have been registered in the MOOC, which is a reasonable drop-out rate for free online training programs. Of all MOOC students, 147 students have completed at least one module of a course, while 87 completed at least one course. As part of the SMACITE pilots, we launched the [SMACITE awards](#) that was a kind sponsorship of the Greek Computer Society, a non-profit organization, committed to representing all Greek scientists and professionals engaged in activities relevant to Computer Science, Information Technology, Telecommunications and other relevant scientific areas.

For more information, please refer to the deliverable **D5.3: Report on SMACITE pilots**.

Quality Assurance Plan

The Quality Assurance Plan describes in detail the peer review system for quality control of project results, the quality standards and review criteria of project results, as well as the project quality assurance procedures for transparency, continuous improvement, and effective communication between partners. The scope of the Quality Assurance Plan includes the quality practices and procedures to be employed by the project partners, in the development of all results of the project. Among the main goals, which are pursued by the Quality Assurance Plan, are the improvement of the quality of project deliverables in terms of practicality, functionality, exploitation, as well as the quality of processes (establishment of transparency and consistency as well as mutual trust among partners).

For more information, please refer to the deliverable **D6.1: Quality Assurance plan**.

Risk management plan and risk register

The risk management plan establishes a systematic process to identify, analyse and respond to eventual risks that might affect the project objectives, as well as to identify the roles and responsibilities related to the management of risks. All this information is depicted in the risk registry that is a core tool that the SMACITE partnership used to manage project risks. In short, the risk management plan presents the procedures applied and the rationale of the tools used (risk register) to identify and document preventive or corrective actions, mitigate potential risks or even contingency measures in the case that a risk occurs.

For more information, please refer to the deliverable **D6.2: Risk Register**.

Project evaluation plan

The project evaluation plan identifies the processes, and the tools utilized during the project to evaluate its outputs and impact. A participatory evaluation approach was adopted to assess the project outputs, as well as project impact on main target groups. This approach is in general, a partnership approach to evaluation in which all participating countries and partners of the project have been actively engaged in developing the evaluation and all phases of its implementation. The main project outputs evaluated during this process by the project partners, and other key stakeholders are the following: the pilots, the online courses at the MOOC, the online training at Virtual Worlds, and the workshops together with the final conference.

For more information, please refer to the deliverable **D6.3: Project evaluation plan**.

Dissemination plan

The objective of the SMACITE dissemination plan is to identify and organize the activities to be performed to promote the widest dissemination of knowledge from the project, as well as engagement from the target audiences and relevant stakeholders. The ultimate goals of the dissemination plan were (1) To make the project results visible to others, i.e., the main target groups, the key stakeholders and especially the end-users who are going to exploit the project results. This has been achieved by the process of promotion and awareness raising that run through the entire life cycle of the project and even after its end; (2) To convince the key stakeholders to exploit the main project results, and if possible, transfer them at other domains and/or sectors; and (3) To take actions ensuring that after the project ends, its results will keep alive and will be exploited by relevant stakeholders.

For more information, please refer to the deliverable **D7.1: Dissemination plan**.

Project promotional material

During the project various promotional materials have been developed that are accessible through the project website:

- 6 newsletters.
- 3 Press Releases.
- Project presentation.
- Rollup available
- Leaflet
- 3 Promotional videos

More, we made the following publication in well-known journals and conferences.

- Pospelova V, López-Baldominos I, Fernández-Sanz L, Castillo-Martínez A, Misra S. (2023). **User and Professional Aspects for Sustainable Computing Based on the Internet of Things in Europe**. Sensors. 23(1):529. <https://doi.org/10.3390/s23010529>

- Gkamas V, Rigou M (2023). **A Multidisciplinary Training Program for Smart Cities Technicians and Engineers**. International Conference on Education and New Developments, 24-26 June 2023. https://doi.org/10.36315/Education-and-New-Developments_2023_Vol_I.
- López-Baldominos I, Pospelova V, Fernández-Sanz L, Castillo-Martínez A (2024). **Modelling and analyzing the availability of technical professional profiles for the success of Smart Cities projects in Europe**. Sensors 24(18), <https://doi.org/10.3390/s24186089>.
- Gkamas V, Rigou M, Gueorguiev I, Kyurdyan V (2025). **Training Smart Cities Professionals on Digital and Horizontal Skills in the Industry 5.0 Era**, IEEE Global Engineering Education Conference, 20-25 April 2025.
- Rigou, M.; Gkamas, V.; Perikos, I.; Kostas, K.; Kontodiakou, P. **Utilizing Virtual Worlds for Training Professionals: The Case of Soft Skills Training of Smart City Engineers and Technicians**. MDPI Computers, 2025, accepted.

For more information, please refer to the deliverable **D7.3: Project promotional material**.

National project workshops, European-wide workshops, and final conference

During the project, various events have been organized by the SMACITE partners. The aim of those events was to bring together different stakeholders from academia, VET, industry and the public sector, as well as to increase the visibility of the project and its results. More specifically the following events took place:

European workshops

- [1st European SMACITE workshop](#). The event was organized online on 20th September 2023. Representatives of EU institutions, education providers, VET, public authorities and businesses (solutions' providers) joined the event and participated in the breakout sessions to facilitate connections among peers around Europe. SMACITE project's findings on technical and soft skills for smart cities engineers and technicians were concretely presented by the project partners Universidad de Alcalà and University of Patras.
- [2nd European SMACITE workshop](#). The event was organized during the EU Week of Regions and Cities 2024 taking place on 8 October 2024, from 09:30 to 10:30 CEST, at the Albert Borschette Congress Center in Brussels. It dived into how local talent and skill development can drive sustainable growth in rural areas, sharing insights from EU-funded projects and public-private partnerships, including the SMACITE project.
- [3rd European SMACITE workshop](#). This event was organized as part of the SMARCO Erasmus+ Blueprint project's kick-off meeting. It took place in Brussels on 20th February 2025 bringing together participants both in-person and online. This 1.5-hour panel explored how public authorities can lead the way by equipping their

teams with the digital and transversal competences needed to build, implement, and sustain smart, inclusive, and green local development.

National workshops

- [1st SMACITE workshop in Spain](#). The event took place at Politeknika Txorierrri on October 5th, 2023. Representatives from companies, HE/VET providers and students got to know the latest news about SMACITE project: the partnership, the project objectives and expected results.
- [1st SMACITE workshop in Bulgaria](#). The event took place during the BASSCOM autumn retreat in the city of Stara Zagora between October 27-29. It was organized by BASSCOM and ESI Center Eastern Europe, which are the Bulgarian partners in the project. The event was attended by the leaders of BASSCOM member companies, as well as representatives from educational institutions, NGOs - regional partners of two Bulgarian organizations in Stara Zagora, and officials from Stara Zagora municipality.
- [1st SMACITE workshop in Greece](#). The event took place on Thursday 23rd November 2023 at the premises of the University of Patras, in Patras, Greece. The workshop has been co-organized by University of Patras and Olympic Training and Consulting, partners in the SMACITE project. During the workshop, the SMACITE project was presented, together with other projects on the domain of Smart Cities and digital initiatives from the Region of Western Greece, Municipality of Kalamata and Municipality of Trikala.
- [1st SMACITE workshop in Italy](#). It was divided into 4 events that took place on 30th October, 15th November, 21st and 22nd December 2023 in Alba (2), Guarene and Genoa, Italy with 43 participants. Apro Formazione chose to organize the event by dividing it into four sessions for specific audiences to facilitate participation and deepen the most important aspects for each type of stakeholder. For more information visit this [link](#).
- [2nd SMACITE workshop in Bulgaria](#). The event took place in Pamporovo, Bulgaria, on November 15-17, 2024, during the BASSCOM Autumn Retreat. The event brought together over 65 key stakeholders from the Bulgarian IT ecosystem, including industry leaders, academics, and public sector representatives.
- [2nd SMACITE workshop in Spain](#). This event co-organized by the Comunidad De Madrid and University of Alcalá on 18th February 2025 at Getafe, brought together experts from the academia, the industry and the public sector representing diverse stakeholders, such as the Spanish Federation of Municipalities and Provinces (FEMP) and the Association of Computer Technicians (ATI).
- [2nd SMACITE workshop in Italy](#). Organized by APRO Formazione on 5th March 2025 in Abla, this event gathered participants representing diverse organizations. In the

event, the SMACITE project results were presented, and a roundtable discussion took place with the participation of top experts.

- [2nd SMACITE workshop in Greece](#). The event was organized by the University of West Attica with the support of UNICERT in Athens, on 26 February 2025. The workshop gathered participants from the academia, industry and the public sector. Overall, the workshop not only showed the results of the SMACITE project together with the latest advancements in smart city technology, but also emphasized the need for continuous innovation and education. It provided valuable insights into how smart applications can reshape urban environments, ensuring that cities and communities are well-equipped to face future challenges.

Conference

- [Final conference](#). The final event of the SMACITE project took place in Athens, on 8th May 2025 bringing together stakeholders from higher education, VET, industry and the public sector. At this event various presentations took place: (1) the SMACITE project together with its key results, (2) EU funding opportunities and recent updates on the EU agenda on (digital) skills development, (3) initiatives of the city of Athens for its digital transformation, (4) relevant projects for Smart Cities and digital skills development. The conference has been concluded with a round table discussion on AI-Driven Governance, Public-Private Collaborations & Talent Development for Smart Cities.

For more information, please refer to the deliverable **D7.4: National project workshops, European-wide workshops, and final conference**.

Exploitation and Sustainability Guide

This guide discusses how the project results can be exploited by relevant stakeholders as well as the individual exploitation plan of each SMACITE partner. Moreover, it defines different business models and funding options and instruments for the sustainability of project results after its end, as well as it examines potential Intellectual Property Right issues.

For more information, please refer to the deliverable **D7.5: Exploitation and Sustainability Guide**.

Project impact assessment report

The project impact assessment report discusses the impact of the project on the different stakeholders, namely the SMACITE partners, learners, enterprises and public organizations, education and training providers (HEIs and VET providers), and policy makers, including the broader European education and training ecosystem.

For more information, please refer to the deliverable **D7.7: Project impact assessment report**.

6 Project impact

Through its three-year implementation, the SMACITE project created direct (short-term) impact on diverse stakeholders, i.e. the SMACITE partners, learners, enterprises and public organizations, and education and training providers (HEIs and VET providers). Moreover, SMACITE has the potential to create an impact on policy makers and the broader European education and training ecosystem in the medium/long-term.

Impact on SMACITE partners:

The SMACITE project significantly influenced its partner organizations by fostering collaboration among HEIs, VET providers, industry representatives, and public sector stakeholders. This collaboration facilitated the exchange of knowledge, experience, and best practices in education and training, while also strengthening the interconnection between different sectors. As a result, the partners gained a deeper understanding of adult training needs and developed more holistic approaches to delivering training courses. The project raised awareness of the specific technical and non-technical competencies required for professionals in the Smart Cities sector and encouraged the exploitation of project results by the SMACITE partners.

Impact on learners:

Learners involved in the SMACITE project benefited from an increased understanding of the competencies required for Smart Cities engineers and technicians. The project helped clarify the specific knowledge, skills, and abilities needed in these roles and provided opportunities to develop them through comprehensive training that covered technical domains, soft skills, entrepreneurial, and green competencies. Using a personalized diagnostic tool, learners received educational experiences tailored to their individual profiles. Their participation led to enhanced skills in the Smart Cities sector, with the added value of micro-credentials and certifications offering formal recognition and portability of their skills. This, in turn, supported greater mobility for professionals across the EU.

Impact on enterprises and the public sector:

The SMACITE project helped enterprises and public organizations benefit from an upskilled workforce that combines technical expertise in Smart Cities technologies with essential soft, entrepreneurial, and green skills. The development of ESCO-compliant job profiles ensured that the training content matched industry demands. Additionally, enterprises and public institutions without dedicated training facilities gained access to free educational materials and toolkits. The project promoted a culture of collaboration between education, industry, research, and public entities, enhancing awareness of competency requirements and fostering capabilities to support the development of sustainable Smart Cities.

Impact on education and training providers (HEIs and VET):

For higher education institutions and VET providers, the SMACITE project strengthened their ability to train highly skilled Smart Cities professionals. It facilitated the creation of an ecosystem where innovative educational content and tools were co-designed with industry and public sector inputs. SMACITE fostered closer collaboration with external stakeholders, increased recognition of training through the use of micro-credentials and certifications, and reshaped the way continuous vocational education is delivered—encouraging the integration of diverse methodologies and digital tools.

Impact on policy makers and the European education and training ecosystem:

The project has the potential to advance European and national priorities in education and training, particularly in the areas of Smart Cities and the integration of soft, entrepreneurial, and green skills into curricula. It has also the potential to enhance the responsiveness of higher and vocational education to technological developments and industry needs, contributing to a more effective alignment between labor market demand and educational supply. Moreover, SMACITE played a role in increasing the visibility and innovative capacity of the broader European education and training ecosystem.

For more information, please see the deliverable **D7.7: Project impact assessment report**.

7 Conclusions

The SMACITE project has made a significant contribution to the upskilling and reskilling of Smart Cities professionals across Europe. Over the past three years, the consortium has successfully addressed a growing skills gap by developing a pioneering, interdisciplinary training program that merges technical knowledge with soft, green, and entrepreneurial competencies. Through its modular, learner-centered curriculum and innovative tools—including a MOOC, immersive Virtual Worlds, and a diagnostic platform for personalized learning—the project has established a replicable framework for vocational education tailored to the evolving needs of Smart Cities.

Crucially, SMACITE has bridged the divide between education, industry, and the public sector. It has fostered a strong ecosystem of collaboration that spans academic institutions, VET providers, technology developers, policy makers, and urban stakeholders. This co-creation approach ensured that the job profiles and training content were grounded in real-world needs, enhancing both the relevance and employability of learners.

The successful piloting of the training program has validated the effectiveness and scalability of the project outcomes. Learners reported enhanced competences, confidence, and career-readiness, supported by flexible certification pathways and micro-credentials. Moreover, public organizations gained access to practical training resources that can immediately support their digital transformation goals.

Looking ahead, the project's sustainability plan and open access to learning resources and platforms lay the foundation for continued impact. The future of our cities depends on the skills of those who build and manage them. Through SMACITE, we have made a contribution on ensuring they are ready.



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