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SKILLS4WATER

REPORT ON PILOT TESTING AND VALIDATING

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PROJECT INFO

Project title	Advancing the Integration of Soft Skills in Higher Education for Water
Project acronym	SKILLS4Water
Project reference number	2023-1-RO01-KA220-HED-000160511
Funding scheme	Erasmus+KA220-HED
Web address	www.skills4water.eu
Coordination institution	UNIVERSITATEA DUNAREA DE JOS DIN GALATI
Project duration	01 September 2023 – 31 August 2025

DOCUMENT CONTROL SHEET

Work package	WP3: Institutional Capacity Building for Curriculum Integration and Development
Ref. no and title of activity	A3.2. Incorporating designed soft skills in HEI's curricula
Title of deliverable	D3.2. Report on pilot testing and validating
Lead institution	University of Cadiz (UCA)
Author(s)	Irene Laiz, Nina Lazăr
Document status	Draft
Document version and date	v03, 16/07/2025
Dissemination level	International

VERSIONING AND CONTRIBUTION

Version	Date	Revision Description	Responsible partner
v01	04/07/2025	First draft	UCA
v02	08/07/2025	Second draft	UCA
v03	16/07/2025	FINAL draft	UCA



List of Abbreviations and Acronyms

Abbreviation/Acronym	Meaning
ACEEU	Accreditation Council for Entrepreneurial and Engaged Universities
CBHE	Capacity Building in Higher Education
EACEA	Education, Audiovisual and Culture Executive Agency
EC	European Commission
EQF	European Qualifications Framework
EU	European Union
FACEEE	Faculty of Automation, Computers, Electrical Engineering and Electronics
FFSE	Faculty of Food Science and Engineering
H2O-People B.V.	Personal development organisation
HE	Higher Education
HEI	Higher Education Institution
IPS	Interpersonal skills
LA	Learning activities
LLL	Lifelong learning
MOOC	Massive online open courses
PES	Personal skills
SG	Serious games
SIS	Situational skills
SOS	Soft skills
UCA	University of Cádiz
UDL	Universal Design for Learning
UGAL	“Dunarea de Jos” University of Galati
UNI	University of Niš
VR	Virtual reality
WP	Work Package
WRM	Water Resources Management





Executive Summary

The water industry needs a highly skilled workforce able to adapt to the evolving market and societal needs, which includes appropriate training in soft skills. To tackle future challenges, the European Commission (EC) aims to upskill the workforce to address skill shortages, prompting research projects like Skills4Water. This project focuses on integrating soft skills training into higher education curricula bridging the gap between academic training and the water industry demands.

The project's Work Package 3 (WP3) aims to upscale and improve the higher education (HE) curricula for water management with soft skills, by offering custom-tailored learning activities to be incorporated in classes. Additionally, this WP pursues pilot testing and validation of the framework and guidelines developed in the WP2 (Skills4Water deliverables D2.2 and D2.3). More specifically, a set of learning activities were specifically designed to be implemented in class for the acquisition of selected soft skills (Activity A3.1) based on those reports. By implementing the designed learning activities, the Skills4Water project aims to provide HEI students with a more comprehensive education that goes beyond technical knowledge and helps develop their future career, targeting the acquisition of the selected soft skills (personal, interpersonal and situational).

The three HEI's participating in the Skills4Water project implemented selected learning activities within the classes defined in D2.2 along the academic year 2024-2025. This report summarizes the results obtained during the pilot testing and validating phase (Activity A3.2).



1. Introduction

The water sector needs a highly skilled workforce that can adapt to changing market conditions and societal demands, which involves proper training in soft skills. As industries evolve, technical expertise alone is no longer sufficient for graduates to thrive in the workplace. While hard skills form the foundation of professional competence, soft skills such as communication, teamwork, problem-solving, adaptability, responsibility or motivation are increasingly recognized as essential for career success. This is particularly relevant in complex, interdisciplinary sectors like the water industry, where collaboration across diverse teams and stakeholders is critical.

To meet future challenges, the European Commission is working to enhance workforce skills and address existing shortages, leading to initiatives like the Skills4Water project. This project aims to incorporate soft skills training into higher education programs, helping to align academic preparation with the needs of the water industry.

The project's Work Package 3, *Institutional capacity building for Curriculum Integration and Development*, aims to upscale and improve the higher education curricula for water management with the soft skills. For this purpose, two specific objectives were designed:

- 1- Design learning activities in the class for the acquisition of the soft skills defined.
- 2- Test and validate the guideline and framework developed in WP2 (deliverables D2.2. and D2.3.) in selected pilot HEIs and make necessary modifications based on feedback and evaluation results.

To accomplish the specific objectives of WP3, three complementary activities were designed. During Activity A3.1, a selection of custom-tailored learning activities was elaborated to be incorporated in classes as part of objective 1. Results were presented in deliverable D3.1 *Report on designed learning activities*. Activity A3.2 was focused on implementing selected learning activities within the classes defined in D2.2 during the academic year 2024-2025. Three HEIs (University of Cádiz – UCA, “Dunărea de Jos” University of Galati – UGAL, University of Nis - UNI) participating in the Skills4Water project contributed to this activity. Results are presented in this report. Finally, Activity 3.3 focused on preparing an assessment guide for validating the soft skills acquired throughout the learning activities within the modernized water education curricula. Results are presented in deliverable D3.3 *Soft Skills Assessment Guide*.

These specific objectives contribute to the overall objective of the Skills4Water project to upscale the soft skills and competencies of young water professionals in water higher education curricula.

By embedding soft skills training into higher education, institutions can prepare students to meet the demands of today's workforce and contribute meaningfully to solving complex global challenges. This holistic approach not only benefits individual careers but also strengthens entire industries and communities.

2. Methodology

2.1 University of Cadiz, Spain

The University of Cádiz (UCA) selected five subjects taught in different degrees from the School of Marine, Navigation and Radio Electronics Engineering and from the Faculty of Marine and Environmental Sciences. The subjects covered the three levels of education, i.e., bachelor, master, and doctorate, following deliverable D2.2- *Standardized framework for integrating soft skills into the higher education curricula for water management*. During Activity A2.2, each subject's curriculum was evaluated to identify gaps in the coverage of the six soft skills selected as part of Activity A2.1- *Evaluation of soft skills in the European water sector*, namely responsibility, motivation, teamwork, communication, problem-solving, and flexibility/adaptability. Specifically, missing or poorly covered skills were identified in each subject, along with the need for improvement and the possibility of being implemented without modifying the curricula or jeopardizing the courses' contents. In all cases, the specific teaching methods indicated in deliverable D2.3.- *Practical guidance for implementing the framework* were assessed independently for each of the subjects and the most relevant or suitable methods were implemented.

The following subjects were selected:

- *Physics I: Mechanics and Thermodynamics*, taught during the 1st year at the BSc in Navigation and Maritime Transport. This subject includes theory lessons, problem-solving seminars, laboratory practices and, therefore, all the skills were covered apart from flexibility and adaptability. The selected methods included workshops, interactive discussions, seminars, and hands-on training. Considering that Physics has the reputation of being a difficult and useless subject among first year students, one of the main skills targeted during the theory lessons was motivation. For this purpose, a collection of short-duration videos freely available in Youtube showing common situations related with particular topics within the subject were identified and played at the beginning of the corresponding lesson in a *flipped classroom* style and students were asked if they knew how to explain what they saw. A few minutes later, the lecturer explained what the video was exhibiting within a Physics point of view and proceeded to illustrate the pertinent laws and equations. Similarly, a set of practices typical of this profession were presented and solved using Physics laws (e.g., navigation issues, stability during ship stowage, etc). Problem-solving was tackled during the problem-solving seminars,



by adapting the formulation of the problems to real-world problems related with the discipline to enhance their motivation to learn. Oral communication was addressed both during the theory lessons and the problem-solving seminars by asking questions to students, encouraging them to answer and giving them appropriate feedback. Finally, responsibility, teamwork and written communication skills were specifically addressed during the laboratory lessons, where the students were divided into teams of 4-5 persons and the experiments were specifically designed to be performed as a team, also promoting social interaction and cognitive growth. Due to the elevated number of students in this subject (< 95), most of the tailored activities (D3.1) could not be implemented. Taking into account that students were not always conscious of the soft skills they were developing, an awareness system was employed, so they could identify and internalise them.

- *Entrepreneurship and innovative projects*, taught at three MSc programs of the Faculty of Marine and Environmental Sciences (MSc in conservation and management of the natural environment, MSc in aquaculture and fisheries, and MSc in integrated management of coastal areas). In this case, the six soft skills were implemented. To facilitate their development, teams of two or three students were formed, who had to develop a business creation project or an innovative environmental or social project in line with their master's degree profile. To do this, they began with an analysis of the needs and problems to be solved for specific segments of people or users. Of course, the idea behind their project had to be motivating for its development. The final assessment of the projects and the course was carried out through a written submission and an oral defence of their work.
- *How to captivate your audience: effective communication skills for scientists*. This course is offered within the International Doctoral School in Marine Studies (EIDEMAR) and it is specifically tailored to teach doctoral students how to present oral communications for a wide range of audience, including scientists (i.e., at scientific conferences), stakeholders or the general public (i.e., during science communication activities). Presentations are really important for scientists and teachers, as they need to communicate their work effectively to other scientists, students, or the general public. However, most of them do not receive adequate training during their careers. Despite technological advances from the days of the blackboard as the main tool to the universal use of PowerPoint, or other tools such as Canvas and Genially today, the quality of presentations has not improved dramatically. In fact, the opposite is true. Today, we are overwhelmed by presentations that fail to convey their





message and inspire. A basic understanding of how our brain works is important in order to understand how to convey our message. These principles are often used in marketing, media, and politics. In addition, it is very important to have clearly identified the message to be conveyed, the medium used, the ultimate goal, the target audience, etc., before beginning to prepare our presentation. Finally, the style of the presentation and non-cognitive communication through the use of our voice and body are also essential in helping to clarify the message and establish a connection between the sender and the audience as the receiver of the message. This lack of training has led to a series of inappropriate practices that are maintained throughout different stages of teaching/research and are then transferred to and demanded of students. Therefore, giving effective and interesting presentations that are well structured, clear in content, and connect with the audience is of particular interest for the development of teaching and research activities. Therefore, the aim of the course was to provide participants with basic knowledge of communication psychology and the aspects to consider when presenting any material, whether educational or scientific, in order to increase their ability to communicate effectively through their presentations. These types of courses are always well received and really have an impact on the way students and future professionals communicate their results and ideas to peers and to the general public.

Furthermore, the *Symposium of students of the Faculty of Marine and Environmental Sciences* (SACMA) was also chosen for the implementation of selected soft skills. SACMA is an annual symposium organized by faculty members since 2015. It is structured as a scientific workshop, where all the participants are students (final-year BSc students, MSc, or doctoral students) who present their research work as either a poster (including a 5-minute talk), an oral presentation or a short video clip. Sessions include a panel of professors who evaluate the students' abstracts, posters and/or oral presentations, ask questions and provide feedback. The purpose is to assess the student's communication skills (written and oral). Therefore, one month prior to the symposium, two courses were offered for the students registered in the symposium to enhance their oral and written communication skills (Figure 1). The trainer, who holds a PhD in Marine Sciences, is specialized in training young professionals in several soft skills, including motivation, or oral and written communication, among others.



Figure 1. Course organized for SACMA participants on *Oral communication*

Students were asked to fill two self-assessment questionnaires: one before the lessons/courses started, with the aim of evaluating their initial level in the soft skills selected, and one at the completion of the semester/course to assess their self-perceived improvement in the acquisition of those soft skills.

Finally, a SWOT analysis was carried out to assess the overall impact of the activities employed with the aim of identifying the strengths, weaknesses, opportunities, and threats faced during the implementation process.

2.2 “Dunărea de Jos” University of Galați, Romania

“Dunărea de Jos” University of Galati (UGAL) implemented a significant stage aimed at integrating soft skills into the curricula of academic programmes related to the water sector, at both bachelor's and master's levels. The intervention targeted the development of the six essential competencies selected (Activity A2.1) with the aim of supporting their education for professional life.

Four university courses were chosen for this purpose: two from the Faculty of Automation, Computers, Electrical Engineering and Electronics (FACEEE) and two from the Faculty of Food Science and Engineering (FFSE). At FACEEE, the bachelor's program in Bioengineering and the master's

program in Information Systems for Advanced Control of Biotechnological Processes were selected. At FFSE, the chosen programs were Recirculating Aquaculture Systems at the bachelor's level and Recirculating Aquaculture System Engineering at the master's level.

Firstly, an analysis of the soft skills implementation was performed and focused on:

- identifying the degree to which these soft skills were already covered in the existing curricula,
- assessing the need for improvement,
- and evaluating the opportunities to integrate specific activities.

All activities and adaptations were designed based on the two key deliverables of the project: D2.2 and D2.3. Based on these guiding documents, dedicated soft skills development activities were introduced during lectures, seminars, and laboratory sessions.

Students were introduced to the Skills4Water project, its objectives, and the relevance of soft skills in their future professional lives (Figure 2). They were familiarized with the concept of soft skills and the six targeted competencies. They completed an initial self-assessment questionnaire, designed to help them evaluate their level of soft skills before participating in the activities (Figure 2). In addition, they took part in interactive games and educational activities, specially developed in alignment with the project's methodology and tailored to each subject (Figure 3).

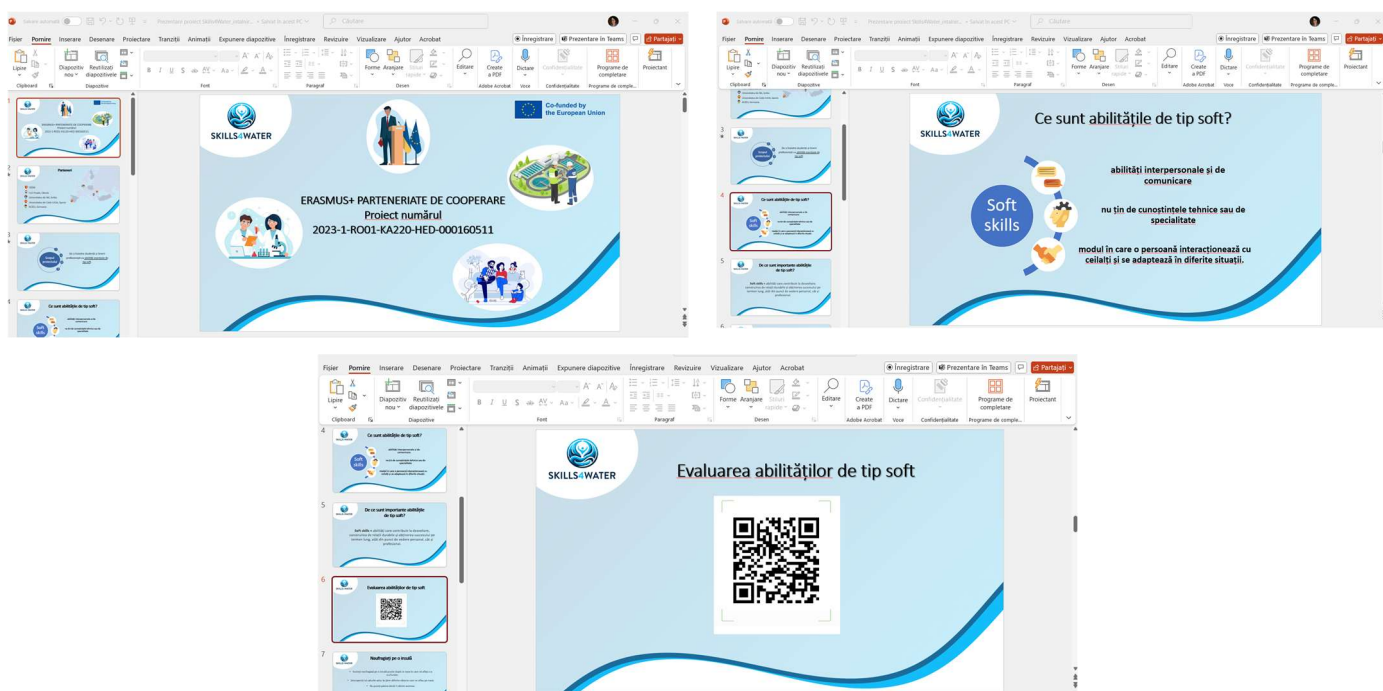


Figure 2. Screenshots from the presentations used during teaching sessions

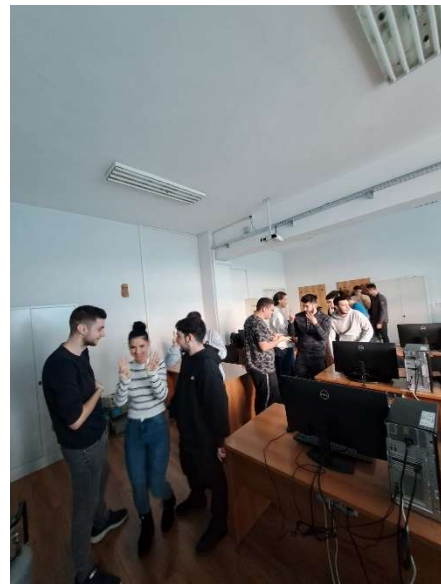
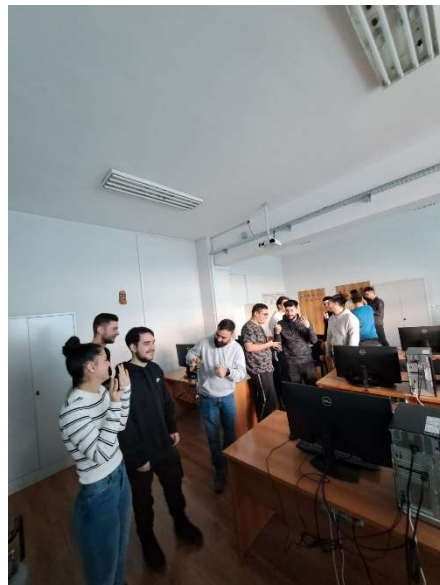


Figure 3. Photographs captured during student activities in class

These activities aimed to develop skills such as communication, adaptability, problem-solving, etc. in a deliberate and structured way. In parallel, some skills, such as teamwork, were also exercised during group activities in seminars and labs, even if students were not always explicitly aware of this developmental process. At the end of the intervention, students completed a final self-assessment questionnaire to measure the impact of the activities, and the personal progress achieved.

Moreover, in order to evaluate the overall effectiveness of the activities, to better understand their impact on the students and teachers, a SWOT analysis was conducted. This aimed to identify the strengths, weaknesses, opportunities, and threats encountered during implementation, offering a

clear and strategic overview of aspects that can be replicated, refined, or improved in the future.

2.3 University of Nis, Serbia

The University of Nis (UNI) selected four subjects taught in bachelor and master study programmes, three from the Faculty of Occupational Safety and one from the Faculty of Civil Engineering and Architecture that were organised in a hybrid mode because of the current situation in Serbia.

To begin with, a comprehensive analysis was conducted to assess the implementation of soft skills within the existing academic curricula. This initial phase focused on three core aspects:

- identifying the extent to which soft skills were already embedded in current course structures,
- evaluating the need for further development or enhancement of these competencies,
- and exploring opportunities for integrating targeted soft skills training through specific academic activities.

The design and implementation of these interventions were guided by the project's key deliverables, namely D2.2 and D2.3, which provided a robust framework for aligning soft skills development with the broader objectives of the Skills4Water project. Drawing from these foundational documents, a series of structured activities were carefully integrated into lectures, and laboratory exercises to support the cultivation of essential non-technical competencies.

At the outset, students were introduced to the Skills4Water project, its aims, and the significance of soft skills in shaping their professional readiness and employability. Through this introduction, they became acquainted with the concept of soft skills and the six core competencies identified by the project as critical for the water sector. To establish a baseline, students completed an initial self-assessment questionnaire, allowing them to reflect on their current skill levels and recognize areas for personal growth.

Throughout the semester, students participated in a range of interactive learning activities designed to promote competencies such as communication, adaptability, critical thinking, and problem-solving (Figure 4). These activities were contextually adapted to the content of each subject and aligned with the Skills4Water methodology to ensure relevance and coherence. Case studies and scenario-based discussions were employed to make the learning process engaging and effective.

In addition, group work during classes naturally fostered collaboration and teamwork. While some of these skill-building opportunities were explicitly framed as soft skills exercises, others were embedded more implicitly within the structure of collaborative academic tasks, contributing to skill development in an organic manner.

At the conclusion of the implementation phase, students completed a final self-assessment questionnaire. This served to measure their perceived progress and evaluate the effectiveness of the soft skills interventions in terms of personal development and increased awareness of their competencies.

To complement the student feedback and gain a holistic view of the intervention's impact, a SWOT analysis was carried out. This involved both students and teaching staff and aimed to identify the Strengths, Weaknesses, Opportunities, and Threats associated with the introduction of soft skills into academic practice.

In order to ensure consistency and sustainability of soft skills integration across the courses, teaching staff underwent preparatory sessions and collaborative planning meetings. These sessions aimed to build a shared understanding of the six core competencies, align pedagogical strategies, and design interdisciplinary approaches to soft skills training. Faculty members exchanged experiences and identified best practices for embedding soft skills within technical content, ensuring that the initiative was not perceived as an add-on, but rather as an essential element of holistic education.

The teaching staff paid special attention to student motivation and engagement. During the activities, facilitators employed diverse educational techniques such as problem-based scenarios, and reflection exercises to maintain a high level of participation.



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Participants

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In this meeting (7)

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- 1505 Stefan Stanimirovic
- 17104 Petar Stankovic
- 22102 Andjela Tandic
- 22103 Natasa Bogic
- 22104 Anastasija Ristic
- 24101 Marko Djordjevic

Suggestions (3)

- 17128 Luka Damjanovic
- 22086 Stefan Mitrovic
- 13206 Kristina Zdravkovic

Agents (1)

- Asana

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- 22103 Natasa Bogic
- 22104 Anastasija Ristic
- 24101 Marko Djordjevic

Suggestions (3)

- 17128 Luka Damjanovic
- 22086 Stefan Mitrovic
- 13206 Kristina Zdravkovic

Agents (1)

- Asana

From dictionary - personal attributes that enable someone to interact effectively and harmoniously with other people.

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- 17104 Petar Stankovic
- 22102 Andjela Tandic
- 22103 Natasa Bogic
- 22104 Anastasija Ristic
- 24101 Marko Djordjevic

Suggestions (3)

- 17128 Luka Damjanovic
- 22086 Stefan Mitrovic
- 13206 Kristina Zdravkovic

Agents (1)

- Asana

Project partners

- "Dunărea de Jos" University of Galați
- H₂O-People
- University of Niš
- University of Cádiz (UCA)
- ACEEU

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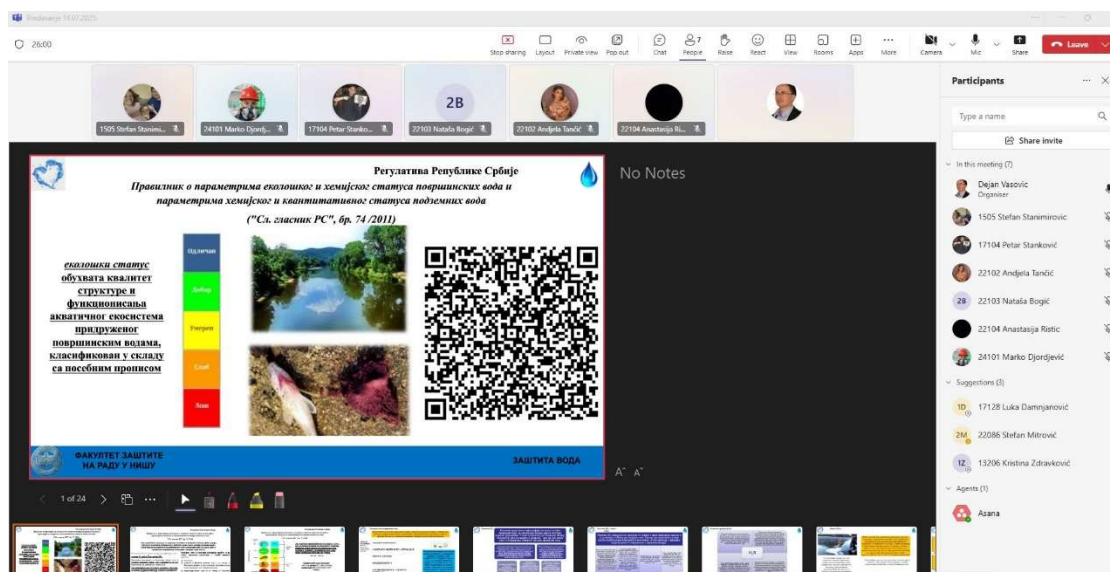


Figure 4. Screenshots from the teaching classes

3. Results and discussion

3.1 University of Cadiz, Spain

The motivation experiment conducted as part of the theory lessons and problem-solving seminars in the *Physics I: Mechanics and Thermodynamics* subject revealed that, when a video was used as an introduction to the topic or when the problems addressed real-life situations, students paid more attention. Furthermore, as the semester drew on, many students started enjoying the subject because some lessons explained real-life situations that they had experienced themselves. With a more motivated and hence focused audience, the lectures could be taught with an optimal learning pace and a more engaged audience. This clearly improved the overall class dynamics and willingness to acquire new skills, including both fundamental knowledge and soft skills like problem-solving or critical thinking. This is in fact one of the conclusions raised in Activity A3.1, indicating that learning activities aimed at strengthening the soft skills of professionals in the water sector must be aligned with the learning outcomes. However, large groups pose a clear difficulty to properly train skills like oral or written communication. These were better addressed at the MSc and doctoral courses as well as at the extracurricular courses offered to the SACMA participants. In those cases, the reduced number of students allowed a personalized monitoring of everyone.



The SACMA communication workshops offered a valuable and well-received opportunity to reinforce essential soft skills among students and served as a replicable model for other extracurricular learning activities within Skills4Water as well as for future SACMA editions. Two short workshops focusing on oral and written communication were conducted one month prior to SACMA, targeting registered participants. The sessions aimed to strengthen students' abilities to present their scientific work clearly and effectively, whether through abstracts, posters, or oral presentations. The workshops were led by a trainer with a PhD in Marine Sciences and expertise in science communication and soft skills development.

Feedback from participants was highly positive. The trainer reported that both groups, though different in composition, were very engaged and expressed that the training was useful and relevant. Some attendees suggested that, in future editions, the workshops could be scheduled earlier in the academic calendar to allow more time to apply the lessons learned to their SACMA contributions.

Several participants also expressed a desire for these types of training sessions to be integrated into degree programmes with more time allocated for practice and deeper exploration, acknowledging the difficulty of developing soft skills in just a few hours. Lastly, attendees requested access to the presentation materials, to further review the tools and concepts introduced during the sessions.

Results from the SWOT analysis (Table 1) indicated that, although the project deliverables and the openness of the teaching staff involved favoured the implementation of soft skills, the impossibility to modify the curricula due to the existing legislation and the limited time within the courses posed a considerable difficulty. Another difficulty was found within the BSc subject when trying to target everyone due to the high number of students enrolled. However, the reduced number of students in MSc and doctorate levels, as well as in the extracurricular courses offered, enabled a more thorough implementation and a more personal evaluation of soft skills.

Although most students were initially unaware of the meaning, importance and impact of soft skills on their academic and personal development, they showed a high receptivity to engage in the learning process, especially once their motivation was continuously targeted by the professor.

One opportunity could be to extend the methodology to other courses and faculties within UCA by creating an internal guide of best practices for soft skills development adapted to the existing institutional policy. However, threats include the lack of flexibility in the existing institutional policy regarding the curricula and the fact that some teaching staff from STEM degrees might show



resistance to integrate soft skills into their lessons.

A more feasible opportunity is to integrate advanced soft skills training as part of the Doctoral School Training Programme by offering dedicated courses, since such courses are optional. The main threats encountered include the lack of funding to bring specialized trainers or the resistance of some supervisors to allow their PhD students to enrol in activities that may be perceived as non-essential, due to the lack of direct correlation with fundamental knowledge acquisition.



Table 1. SWOT analysis of soft skills development activities at UCA

Strengths	Weaknesses
Solid methodological support, based on the project deliverables.	Impossibility to modify the curricula due to the existing legislation.
Large interest from students in activities targeting their future profession or real-world examples.	Limited time within the courses to fully implement and deepen all the necessary activities.
Reduced groups in MSc and doctorate levels facilitated the implementation and evaluation of soft skills.	Difficulty to target everyone due to the high number of students enrolled in BSc degrees.
Flexibility of teaching staff in adapting content and teaching methods without modifying the curricula.	Initial lack of awareness among students regarding the meaning, importance and impact of soft skills.
Diversity of activities (team exercises, self-assessments, joint dissertations, etc.) facilitated the development of multiple competencies simultaneously.	Reduced engagement from students in the self-assessment questionnaires.
Opportunities	Threats
Extending the methodology to other courses and faculties within UCA.	Resistance to change from some teaching staff when integrating soft skills into STEM programmes.
Creating an internal university guide of best practices for soft skills development adapted to the existing institutional policy.	Lack of flexibility in the existing institutional policy regarding the curricula.
Integration of soft skills training as part of the Doctoral School Training Programme (e.g., offering dedicated courses).	Activities may be perceived as non-essential, especially by some supervisors, due to the lack of direct correlation with fundamental knowledge acquisition. Lack of funding.

3.2 “Dunărea de Jos” University of Galați, Romania

The SWOT analysis (Table 2) highlighted that the implementation of soft skills development activities at UGAL was built on a solid foundation, supported by the project deliverables and the openness of the teaching staff involved. A major strength was the genuine interest shown by students toward

interactive methods, which facilitated active participation and experiential learning. Although students were initially somewhat reticent, most of them later became actively and enthusiastically involved in the activities, embracing the interactive approach and contributing meaningfully to the learning process. However, several key challenges remain, particularly the limited time available within course schedules and the initial lack of student awareness regarding the importance of these competencies. These factors may reduce the effectiveness of the intervention if not addressed through deeper curricular integration.

Table 2. SWOT analysis of soft skills development activities at UGAL

Strengths	Weaknesses
Solid methodological support, based on the project deliverables. Varied and diverse activities.	Initial lack of awareness among students regarding the importance of soft skills and the purpose of the activities.
Genuine interest from students in interactive and applied activities.	Limited time within the courses to fully implement and deepen all planned exercises.
Flexibility of teaching staff in adapting content and teaching methods.	Limited availability of adapted teaching resources (e.g., lack of local good practice models in technical education).
Diversity of activities (games, group exercises, self-assessments) facilitated the development of multiple competencies simultaneously.	Reduced engagement from some students in the self-assessment questionnaires.
Opportunities	Threats
Extending the methodology to other courses and faculties within UGAL.	Resistance to change from some teaching staff when integrating soft skills into technical programmes.
Creating an internal university guide of best practices for soft skills development.	Lack of a clear institutional policy regarding transversal competencies in curricula.
Sustainable integration into the curriculum (e.g., introducing dedicated modules or transversal components in course descriptors).	Difficulty in objectively measuring the impact of these activities on students' personal development.
Establishing partnerships with employers to validate the relevance of these competencies in the labour market.	The risk that the activities may be perceived as non-essential, especially by some students, due to the lack of direct correlation with academic evaluation.

On the opportunity side, there is clear potential for scaling the methodology at the institutional level through internal best-practice guides, partnerships with employers, and the explicit inclusion of transversal competencies in course syllabi. These actions would significantly contribute to the sustainability of the initiative. At the same time, some threats are notable, such as resistance to change among certain institutional members or the risk that activities may be perceived as non-essential by students, especially when not directly linked to academic assessment.

To maximize the impact, a coherent institutional approach is needed, one that supports soft skills development as an integral part of the professional training of students in technical and aquatic science fields. This phase of the project demonstrated the real potential of integrating soft skills into technical higher education and provided a practical model that can be applied and adapted in other academic contexts.

3.3 University of Nis, Serbia

Feedback collected through in-class observations and informal student comments suggested that learners were particularly responsive to real-world challenges and practical case studies, which allowed them to link soft skills development with professional scenarios in the water sector. The findings provided valuable insights into what aspects worked well, which challenges were encountered, and how future iterations of similar initiatives could be refined or scaled.

The Skills4Water UNI team plans to use the collected data and insights to inform institutional policy changes and future curriculum revisions. The results of the SWOT analysis, student feedback, and self-assessment metrics will be consolidated into a detailed evaluation report. This report will be shared with academic leadership and curriculum development bodies to support the institutionalization of soft skills education. Ultimately, this initiative demonstrates the feasibility and value of integrating soft skills into higher education in water-related disciplines, reinforcing the long-term goal of equipping students with both technical and transversal competencies essential for future careers.

The implementation of soft skills development activities, guided by Skills4Water principles, proved to be a meaningful enhancement of the academic experience. It provided both educators and students with tools and opportunities to foster essential 21st-century competencies that are increasingly in demand across the water sector and beyond.

The SWOT analysis (Table 3) revealed that the implementation of soft skills development activities at UNI was grounded in a strong institutional context, supported by clear project deliverables and the



commitment of engaged teaching staff. One of the major strengths identified was the genuine interest shown by students in interactive teaching methods, which encouraged active participation and experiential learning. While some students initially approached these activities with hesitation largely due to unfamiliarity with the format or its relevance, the majority quickly adapted, showing enthusiasm and motivation. This positive shift highlights the transformative potential of participatory learning in fostering personal and professional competencies.

Nonetheless, challenges persist, particularly regarding time constraints within already packed course schedules. This limits the ability to fully explore complex soft skill areas such as leadership, adaptability, and communication in depth. Additionally, the initial lack of student awareness about the long-term value of soft skills may dampen engagement unless further awareness-raising measures are introduced. For instance, embedding soft skills assessment into grading rubrics or linking them to employability indicators could significantly boost their perceived relevance. Addressing these challenges requires long-term strategic planning and deeper integration at curricular level.

Opportunities for institutional development are substantial. The success of this initiative has demonstrated that selected two faculties from UNI could serve as a model for other faculties at UNI aiming to mainstream transversal skills into technical disciplines. Developing internal best-practice manuals, organizing peer-to-peer training among teaching staff, and creating advisory boards with industry partners are all steps that can institutionalize and sustain these practices. By systematically incorporating soft skills objectives into course syllabi, UNI can align with national and European trends in higher education that emphasize employability and lifelong learning.

Potential threats must not be overlooked. A small number of staff may view these activities as peripheral or burdensome if institutional support and recognition are lacking. Furthermore, students may deprioritize soft skills development when it is not explicitly connected to their final assessments or professional advancement. To mitigate these risks, it is essential to communicate the value of soft skills clearly and consistently, both through institutional messaging and through real-world examples from employers. Long-term success hinges on shifting institutional culture to one that values and rewards holistic student development.

Table 3. SWOT analysis of soft skills development activities at UNI

Strengths	Weaknesses
• Strong methodological foundation aligned with project deliverables, ensuring consistency and quality. • Rich diversity of activities (e.g., games, group tasks, self-assessments) allowing development of multiple soft skills in parallel. • High level of student interest in interactive and experiential learning formats, contributing to engagement. • Positive learning environment created through a mix of formal and informal learning approaches. • Clear alignment of activities with real-world challenges, enhancing student motivation. • Effective initial communication of project goals and relevance.	• Low initial student awareness regarding the role and relevance of soft skills in professional development. • Insufficient in-course time to fully implement, reflect on, and reinforce all soft skills exercises. • Limited availability of tailored teaching resources and examples relevant to technical and engineering disciplines. • Partial student disengagement during pre/post self-assessment phases, affecting evaluation accuracy. • Inconsistent integration of soft skills assessment in formal grading structures. • Lack of established metrics for evaluating soft skills improvement over time.
Opportunities	Threats
• Institutional expansion of the methodology across multiple departments and academic disciplines. • Development of a formalized internal guidebook for teaching soft skills, promoting long-term sustainability. • Embedding transversal competencies in learning outcomes, module descriptors, and official syllabi. • Building employer partnerships to co-design and validate soft skill training that aligns with labour market needs. • Hosting workshops or training-of-trainers programs to build faculty capacity in soft skills pedagogy.	• Resistance from faculty members hesitant to shift from traditional teaching models to competence-based education. • Absence of an institutional policy or incentive structure to support transversal skills development. • Challenges in systematically measuring soft skill growth and translating outcomes into formal academic metrics. • Student perception that soft skill activities are supplementary or optional due to lack of academic credit weight. • Potential lack of continuity or commitment once external project support ends. • Limited visibility or promotion of the initiative.



To maximize the impact of the intervention, a comprehensive institutional strategy is required. This includes aligning learning outcomes across study programs, creating incentives for faculty innovation in teaching, and encouraging interdisciplinary collaboration. Student engagement can be further increased by showcasing success stories and involving alumni and industry experts in mentorship or guest lecture programs focused on real-world skill applications.

Moreover, the experience gained from this phase of the Skills4Water project has highlighted the feasibility and importance of integrating soft skills into technical education. The initiative showed that with the right support and a carefully planned methodology, students in scientific and engineering disciplines can significantly benefit from transversal competencies. These skills not only can enhance employability but also contribute to the students' ability to work effectively in diverse teams, manage uncertainty, and solve complex problems.

Feedback from both students and teachers has underscored the value of experiential learning methods. Interactive tools such as role-play, structured reflection, and gamification were particularly effective in creating a supportive environment for skill development. These techniques allowed students to recognize the applicability of soft skills in realistic contexts, which strengthened their motivation and personal investment. It also facilitated more dynamic and reciprocal teacher-student relationships, fostering deeper learning outcomes.

Looking ahead, UNI is well-positioned to scale this initiative. Through continued collaboration with the Skills4Water consortium and the adoption of feedback mechanisms such as self-assessment tools and SWOT reviews, the institution can continue to refine its approach. Embedding soft skills in all phases of academic training will prepare students not only to meet current labour market expectations but also to become adaptable, reflective, and socially responsible professionals.



4. Conclusions

The main conclusions extracted from this activity are as follows:

- **Motivation** is a key soft skill that needs to be implemented in class from the lower level of education (first year of or BSc studies, in this case), not only because a more motivated audience ensures a better class dynamics and willingness to learn, but because students that keep motivated during their education will more probably result in motivated professionals.
- The reduced number of students in MSc and doctorate levels, as well as in extracurricular courses targeting a limited audience, enabled a more thorough implementation and a more personal evaluation of soft skills.
- Nevertheless, training in soft skills should be incorporated into the early years to ensure a thorough assimilation by the students.
- The lack of flexibility in some institutional policies regarding the curricula may limit the correct integration of soft skills in the curricula.
- It will be more feasible to integrate advanced soft skills training as part of the Doctoral School Training Programme by offering dedicated courses, since such courses are optional. However, the lack of funding to bring specialized trainers or the resistance showed by some supervisors to allow their PhD students to enrol in activities that may be perceived as non-essential, might be challenging.