



**ENGINEERING and INDUSTRY  
INNOVATIVE TRAINING FOR ENGINEERS  
(ENGINITE)**

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## **IO4-Task 7: Consolidated evaluation report**







Prepared by CUT



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## Task 7: Consolidated evaluation report

In this section, we present the consolidated evaluation report, analysing and synthesizing together the main results derived from the two phases of the ENGINITE pilot training programme. In particular, we will present the feedback as well as a selection of testimonials received by the trainees and the trainers/mentors, during the 1<sup>st</sup> phase of the programme, namely about the training courses period. We will then present the feedback as well as a selection of testimonials received by the trainees and the companies, during the 2<sup>nd</sup> phase of the programme, namely about the structured internship period.

### ENGINITE Phase A: Feedback by the trainees

Overall, the ENGINITE training courses period was ranked highly by the trainees in Greece and in Cyprus. In particular, as it appears in Table 25, the graduate Engineers highlighted that the training courses were interactive and engaging ( $\bar{x}=4.48$ ,  $SD=0.60$ ), contributed to the development of their managerial skills ( $\bar{x}=4.19$ ,  $SD=0.51$ ) and were essential for their future careers ( $\bar{x}=4.19$ ,  $SD=0.51$ ).

Table 25: Overall evaluation of the ENGINITE training courses

The ENGINITE training courses...	Mean	SD	Min.	Max.
...were interactive and engaging	4.48	0.60	3.00	5.00
... contributed to the development of my managerial skills	4.19	0.51	3.00	5.00
...were essential for my future career	4.19	0.81	2.00	5.00
...equipped me better	4.14	0.57	3.00	5.00
...provided me practical and hands-on knowledge	3.90	0.83	2.00	5.00
... increased my employability chances	3.86	0.79	3.00	5.00
...met my expectations	3.67	0.80	2.00	5.00
... contributed to the development of my technical knowledge	3.62	0.92	1.00	5.00

Importantly, the ENGINITE training courses had a significant positive impact on the graduated engineers and improved their problem-solving abilities as well as their problem-solving style in everyday life. As appears in Table 26, there was a statistically significant increase in the participating engineers' (a) "Approach" style towards problem-solving, (b) Personal control over problem-solving, and (c) Self-confidence during problem-solving.

Table 26: Pre-Post problem-solving abilities and style in everyday life

	Pre-test (Before the ENGINITE courses)		Post-test (After the ENGINITE courses)		Z
	Mean	SD	Mean	SD	
"Approach" style	4.42	0.44	4.85	0.49	-2.49*
Personal control	4.27	0.82	4.83	0.99	-2.17*
Self-confidence	4.71	0.52	4.99	0.56	-2.09*

\* $p<.05$ , \*\* $p<.01$ . \*\*\* $p<.001$

Note. Likert-Scale 1-5 (1=Min. and 5=Max)

Evaluating each one the eight ENGINITE courses according to (a) its relevance, (b) its length, (c) its content, (d) its materials as well as (e) its trainer’s confidence and (f) expertise, it seems that the “Employability enhancement & Managerial Skills” courses were ranked higher in comparison to the the “Technical knowledge enhancement” courses.

**Table 27: Ranking of the “Employability enhancement & Managerial Skills” courses**

	Mean	SD	Min.	Max.
A4: Project management in Action	4.16	0.49	3.50	5.00
B4: Supply Chain in a Rapidly Changing Environment	4.07	0.56	2.67	5.00
A2: Innovation, Entrepreneurial and Intrapreneurial Skills	3.97	0.41	3.33	5.00
A1: Efficient Quality and Health & Safety Management Systems	3.94	0.61	2.50	5.00
A3: Engineering Systems Thinking: Re-engineering by Simplifying	3.87	0.59	3.00	5.00
B1: Engineering Economics	3.78	0.83	2.00	5.00
B3: Applied Process and Production Optimization	3.75	0.78	1.33	5.00
B2: Concept to Market Product Development	3.66	0.84	1.33	5.00

The participating young engineers attributed these evaluations, on the following reasoning.

The *Employability enhancement & managerial skills* courses were:

- Easy to follow (there was no technical content)
- Quite novel / New insights (not included in prior academic studies)
- Length was relatively enough to cover the content

On the other hand, focusing on the *Technical knowledge enhancement* courses:

- Some engineers had prior knowledge for some of them (not novel)
- Some engineers found it somehow difficult to follow and grasp everything due to their backgrounds
- More time was needed to cover in more depth these topics

Next, focusing on the aspects of the training that they liked most the participating engineers highlighted (a) the problem-based process, (b) the collaboration between the team members especially with the engineers with different background, (c) the interaction between the trainers and the trainees, (d) the project-based nature of the courses (by the end of each course a project should be submitted), and (e) the courses which were based on real-life problems, included training with new software as well as presentations by industry experts.

The participating engineers also highlighted that they had to deal with various challenges such as (a) the daily commitment to attend the programme, while also working or studying at the same time, (b) the multi-disciplinarity of the groups and the collaboration between the group members, (c) the problem-solving process as a demanding pedagogy (e.g., complexity of real-world problems, trying to approach a problem in an interdisciplinary way, trying to reconcile different options etc.), and (d) the weekly presentations and deliverables. Importantly, the major challenge identified by the participating engineers was the relatively limited duration of each course. As such the main

suggestion of the participants was the extension of the programme, which would allow more time for the problem-solving process, opportunities for deepening more into each course as well as more time for the project assignments. However, despite these challenges, all the participants marked highly the ENGINITE training courses period and this was also reflected in their testimonials. What follows below, is a selection from the testimonials which cover the spectrum of the input provided by the young engineers.

*“The ENGINITE training program is a good opportunity for recently graduated mechanical engineers to expand their knowledge and get a good practice experience. The period of time given is nearly adequate, proportionally to the subjects but the trainers did their best in most cases. It's surely a good life-lesson, about how other engineers think about themselves or the market approach, but also a good opportunity to establish ways to communicate and work with others under a team-type umbrella.”*

**Trainee (Female), 29 years-old, Cyprus**

*“ENGINITE was an intensive but very useful programme, adding value not only to my knowledge but also to my interpersonal skills, respecting always the people and the environment around me.”*

**Trainee (Male), 26 years-old, Cyprus**

*“ENGINITE it was a very good experience for me, as I enhanced my time management, organization and presentation skills. I strengthened my weaknesses. I was given the opportunity to meet people that work in industry and shared their knowledge with us. Trainers shared their experience and were there to explain everything using real-life examples, especially when our ideas were unrealistic! I also developed more skills including innovation and project management. I learnt about new concepts and theories grounded on other engineering disciplines.”*

**Trainee (Female), 22 years-old, Cyprus**

*“I am glad that I participated in the ENGINITE training program. I came with contact with people from other field, we exchanged views and we cooperated in order to solve a problem or to create a project from the begin. I hope that all the experience will help me for my future as engineer.”*

**Trainee (Female), 23 years-old, Greece**

*“The ENGINITE training program was a very nice experience. The training expanded our knowledge in many areas of engineering, giving us the opportunity to solve real and complex problems. Also, it gave us skills that we can use in our career.”*

**Trainee (Female), 25 years-old, Cyprus**

*“The lessons were interactive. I loved that I met new people and we exchanged theories and ideas. I liked that I trained to the management because I didn't t had any experiences before and also the Professors were really helpful and explaining every question we had. The negative of the training was that we had to be attend every day for 3 hours continuously.”*

**Trainee (Male), 29 years-old, Cyprus**

*“ENGINITE is a good training program. I met and worked with interesting people. I learned many new things and I am waiting for the training in industry!”*

**Trainee (Male), 29 years-old, Cyprus**

*“Overall the ENGINITE training programme is a good opportunity for someone who has just finished his/her studies to expand their knowledge and also apply what they learnt from their studies in actual everyday problems. Furthermore, you get to meet new people from different fields of study and learn to cooperate with them in order to achieve a goal. ENGINITE is a programme I would definitely recommend.”*

**Trainee (Female), 23 years-old, Greece**

### ENGINITE Phase A: Feedback by the trainers

The ENGINITE training courses period was also ranked very highly by the trainees. In particular, as it appears in Table 28, the trainers ranked highly that the training programme provided appropriate support to the participants ( $\bar{x}=5.00$ ,  $SD=0.00$ ) as well as that it contributed to employability enhancement, development of managerial skills as well as to technical knowledge enhancement of the young engineers ( $\bar{x}=4.86$ ,  $SD=0.38$ ). They only ranked a bit lower that the training programme was grounded on an adequate blend of theory and practice ( $\bar{x}=4.43$ ,  $SD=0.54$ ) as well as that was ready for wider dissemination ( $\bar{x}=4.43$ ,  $SD=0.54$ ).

Table 28: Overall evaluation of the ENGINITE training programme

The ENGINITE training programme...	Mean	SD	Min.	Max.
... provided appropriate support to the participants	5.00	0.00	5.00	5.00
... contributed to employability enhancement, development of managerial skills and technical knowledge enhancement	4.86	0.38	4.00	5.00
...created positive reactions to the young engineers	4.71	0.49	4.00	5.00
...included a selection of significant training topics	4.71	0.49	4.00	5.00
...met my expectations	4.57	0.54	4.00	5.00
... was grounded on an adequate blend of theory and practice	4.43	0.54	4.00	5.00
... is ready for wider dissemination and further exploitation	4.43	0.54	4.00	5.00

Focusing on the ENGINITE training courses and their delivery the trainers evaluated highly that materials provided during the courses were helpful ( $\bar{x}=4.86$ ,  $SD=0.38$ ). However, aligned with the young engineers’ assessment the trainers evaluated also lower the length of training ( $\bar{x}=3.57$ ,  $SD=0.98$ ).

Table 29: Evaluation of the ENGINITE training courses

	Mean	SD	Min.	Max.
Materials provided were helpful	4.86	0.38	4.00	5.00
My course(s) was/were relevant to the participants' needs	4.71	0.49	4.00	5.00
I was confident and well-prepared	4.71	0.49	4.00	5.00
Content was well organized	4.57	0.79	3.00	5.00
I was knowledgeable for all topics related to my course(s)	4.14	1.57	1.00	5.00
Length of training was sufficient for my course(s)	3.57	0.98	2.00	5.00

Focusing on the aspects of the training that the trainers liked the most, the trainers highlighted (a) the problem-based learning approach, (b) the face-to-face interaction with the participants, (c) the practical field training exercises and the use of case studies, (d) the project presentations by the young engineers as well as (e) the reflective sessions with the young engineers.

The trainers also highlighted that they had to deal with various challenges such as (a) to motivate engineers with different background into the PBL approach, (b) to transfer knowledge and to develop new skills to young engineers via the PBL approach, (c) to address the needs and expectations of all engineers given their different backgrounds and starting points. Importantly, the major challenge identified by the trainers was also the relatively limited duration of each course. As such the main suggestion of the trainers was the extension of the programme, which would allow more time for the problem-solving process as well as more opportunities for deepening more into each course. However, despite these challenges, all the trainers marked highly the ENGINITE training courses period and this was also reflected in their testimonials. What follows below, is a selection from the testimonials which cover the spectrum of the input provided by the ENGINITE trainers.

*“ENGINITE was an ambitious project which introduced the PBL approach to young engineers with different scientific backgrounds. It has definitely improved their problem-solving skills and employability prospects and I hope that they will remember this experience for several years.”*

**Trainer (Male), 57 years-old, Greece**

*“ENGINITE training was a groundbreaking experience both for the participants and the facilitators and definitely this initiation should be adopted broadly in Engineering Education in Europe.”*

**Trainer (Male), 33 years-old, Cyprus**

*“ENGINITE training program was a great opportunity for every young graduate in order to be trained to use the knowledge that they already have and to cultivate skills that let them identify what they need to learn or develop in order to solve/propose solutions to any problem that might arise during their professional journey.”*

**Trainer (Female), 29 years-old, Cyprus**



*“Studying the PBL education method and through the meetings I became a better trainer, and this was worthwhile the effort. In this way I was able to inspire the ENGINITE trainees to become independent learners who can continue to learn on their own in life. And this was a success! “*

**Trainer (Male), 34 years-old, Cyprus**

*“ENGINITE is a training program that can help to minimize the gap that exist between the university and the industry. From my experience of this project, the young engineers had the opportunity to see real problems and through PBL after researching and combined their skills from there different degrees and knowledge (like in a real-life industry) they were able to recommend solutions that were good enough to be real solution scenarios.”*

**Trainer (Female), 39 years-old, Cyprus**

*“ENGINITE, is the most experiential and compact training programme for young engineers to date, which prepares them for the industry real-time! It covers a blend of engineering & business industry topics and gives them the opportunity to build invaluable soft-skills. Additionally, young engineers get to practice their learnings and solve real industry problems through placements in relevant and high-performing organizations. The programme lies its principles in PBL learning, which makes it even more innovative, market-relevant and appealing. The international market is hungry for adaptive and practical skills, and ENGINITE hits right on spot!”*

**Trainer (Female), 33 years-old, Cyprus**

## ENGINITE Phase B: Feedback by the interns

The ENGINITE internship period was ranked very highly by the interns, as all the aspects were evaluated above the average. In particular, as it appears in Table 30, the interns highlighted that during the internship period they had initiated and successfully completed new projects ( $\bar{x}=4.48$ ,  $SD=0.59$ ) and that they developed new technical knowledge ( $\bar{x}=4.39$ ,  $SD=0.58$ ). They have only evaluated a bit lower the feedback received from successful entrepreneurs/company representatives ( $\bar{x}=3.91$ ,  $SD=0.90$ ).

Table 30: Overall evaluation of the ENGINITE internship

During the ENGINITE internship..	Mean	SD	Min.	Max.
... I have initiated and successfully completed new projects	4.48	0.59	3.00	5.00
...I have developed new technical knowledge	4.39	0.58	3.00	5.00
... I became better equipped	4.35	0.57	3.00	5.00
...I have increased my employability potentials	4.26	0.69	3.00	5.00
... my expectations were met during the ENGINITE internship	4.17	0.78	2.00	5.00
...the technical knowledge I gained during the training courses was improved	4.17	0.78	2.00	5.00
...the skills I developed during the training courses were improved	4.17	0.58	3.00	5.00
... I have created a network with like-minded people	4.17	0.89	1.00	5.00
...I have developed new skills	4.13	0.81	2.00	5.00
... I have understood the real industry culture	4.04	1.07	1.00	5.00
...I have opened new channels with the company's representative	4.00	0.90	1.00	5.00
...I have received feedback from successful entrepreneurs/company representatives	3.91	0.90	1.00	5.00



Focusing on their major achievements of the internship period the participating young engineers highlighted the following ones:

- Bridged the academia with labor
- Development of self-awareness (recognition of strengths and weaknesses), self-esteem and confidence
- Development of collaboration and communication skills (learned how to work efficiently together with people of different background, expertise)
- Put in practice theoretical knowledge gained during the undergraduate studies and the ENGINITE training courses
- Development of technical knowledge and practical experience
- Improvement of project management skills (Undertake and execute projects within particular deadlines)
- Improvement of problem-solving skills
- Networking / Collaboration and interaction with industry experts
- Development of a professional portfolio
- Understanding how the industry works
- Increase of the employability potentials

Importantly, most of the participating engineers (87%) reported that they were planning to stay in contact with their hosting organizations.

Overall, all the participants marked highly the ENGINITE internship period and this was also reflected in their testimonials. What follows below, is a selection from the testimonials which cover the spectrum of the input provided by the young engineers.

*The ENGINITE internship was very useful for all the young engineers who have just completed their undergraduate studies and they would like to get ready for the world of the industry. The mindset of the industrial world is much different from whatever I have been taught at the university. In addition, the problem-based learning has been proved as an idea approach for the investigation and the solution of complex and authentic problems.*

**Intern (Female), 27 years-old, Cyprus**

*The ENGINITE internship not only helped me to improve my skills in the design of processes and new products, but at the same time it provided me the opportunity to participate in a real-world project relevant to my domain. The problem-based learning, which was employed during the ENGINITE training courses, helped me at a great degree during my internship. At this point, not only I can find much easier a solution to a problem, but at the same time, I have the ability to evaluate the implementation of a given solution taking into account multiple parameters related to the economy, the society and the environment.*

**Intern (Female), 22 years-old, Cyprus**

*Overall, the ENGINITE internship was a really good program. Through my participation I had the chance to meet new people and share/develop fresh ideas. Furthermore, I was given the chance to work for a big company and got to see first-hand the procedures followed and the actions that need to be taken in order for a company to maintain its high standards. I also got to further expand the technical knowledge and skills I acquired through my studies at the Technical University of Crete. Overall, I would definitely recommend the ENGINITE program because it gives young graduates the opportunity to develop their skills and integrate smoothly into the working environment.*

**Intern (Female), 23 years-old, Greece**

*The ENGINITE internship was the most vivid and creative part of the program and made the ENGINITE complete and more meaningful.*

**Intern (Male), 32 years-old, Greece**

### **ENGINITE Phase B: Feedback by the company supervisors**

The feedback received by the company supervisors about the interns was also relatively high, as all the aspects were evaluated above the average. In particular, as it appears in Table 31, the company supervisors highlighted that the interns adjusted quickly to the working environment ( $\bar{x}=4.85$ ,  $SD=0.38$ ) and had a smooth and productive collaboration with the company ( $\bar{x}=4.85$ ,  $SD=0.38$ ). They evaluated a little bit lower the fact that the interns could find innovative solutions to the company's challenges ( $\bar{x}=3.92$ ,  $SD=0.86$ ) or that the interns brought new and innovative ideas to the company ( $\bar{x}=3.69$ ,  $SD=0.95$ ).

**Table 31: Overall evaluation of the ENGINITE internship**

The intern...	Mean	SD	Min.	Max.
... adjusted quickly to the working environment of the company	4.85	0.38	4.00	5.00
...had a smooth and productive collaboration with the company	4.85	0.38	4.00	5.00
...was motivated and showed real interest for the company	4.77	0.44	4.00	5.00
... contributed to the projects of the company	4.54	0.52	4.00	5.00
...took part in a constructive and supportive internship	4.54	0.52	4.00	5.00
... contributed to the goals of the company	4.46	0.66	3.00	5.00
...could be an ideal new addition to the company	4.31	0.85	3.00	5.00
... could find innovative solutions to our company's challenges	3.92	0.86	3.00	5.00
... brought new and innovative ideas to our company	3.69	0.95	3.00	5.00

Importantly, all the company supervisors, reported that:

- Their expectations were met to their highest degree
- The internship period was of high value for the participating interns

In this context, it is not a surprising that all the company supervisors (100%) reported that they were planning to stay in contact with the young interns, after the end of the partnership period.

This positive evaluation was also reflected in the company supervisors' testimonials. What follows below, is a selection from the testimonials which cover the spectrum of the input provided by the company supervisors.

*Our experience with the ENGINITE intern was fantastic! She worked very professionally, and she had a constructive mindset. She did a fabulous job and I believe that she also gained a lot.*

**Company supervisor (Male), 33 years-old, Cyprus**

*The internship was very useful for our company. The internship provided various knowledge to be used in a demanding working environment. For example, the trainee was able to learn in a short period of time to carry out daily quality assurance reviews and to reassess the maintenance schedule for three production departments. The trainee's ability to understand the steps of the production line and the importance of each of them was one of the major gains in the internship.*

**Company supervisor (Male), 523 years-old, Cyprus**