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Project title	International Cooperation Framework for Next Generation Engineering Students
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NextGEng Project

WORK PACKAGE 4

CASES FOR EXPERIENTIAL LEARNING PROJECTS

R4.13 a

Report of CEL4-Bosch Project evaluation

July, 2025

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WP4	R4.13.a Report of CEL4-Bosch Project evaluation
Authors	Rubén Dorado Vicente
Short Description	The report includes CEL4 evaluation criteria, the agenda for the virtual seminar, s summary of the three students' reports, and the feedback survey
Status	Final
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Date of delivery	21/07/2025
Contributions by:	
Project website	www.nextgeng.eu

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0.1	21/07/2025	Rubén Dorado Vicente	First Draft
0.2	25/07/2025	Ciprian Lapusan	Review
Final	25/07/2025	Ciprian Lapusan	Final Version

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Table of Contents

1. Introduction

The aim of the report is to detail the evaluation procedure of one of the CEL projects developed during the second round, the CEL4-Bosch project. The Bosch Cluj plant proposed the topic: “Evaluation of the screws tightening and elongation in PCB mounting operations” which main objective was to identify the optimal tightening range and elongation of M6 screws in PCB mounting across various housings” and was implemented from February to April 2025. It started with the intensive week (activities detailed in R4.10) where students received tailored seminars and planned the distance working. At the end of April, students presented the result of their work in a virtual seminar. This report summarizes how the assessment of CEL4-Bosch project was done. It includes the evaluation criteria, the virtual seminar agenda, a summary of the students reports and their assessment results. Finally, an analysis of the surveys responses for the target groups is also presented.

This report is the result of the activity: A4.13. Reports and second round evaluation. Final presentations, done by the students during the virtual seminar, are included as annexes.

2. CEL 4 evaluation criteria

The HEIs supervisors and Bosch representative agreed on the evaluation criteria to be applied during the virtual seminar. The groups of students were assessed according to:

- Reports evaluation: strenghts, weaknessess, general overview.
- Presentation: content, length, development, answer to supervisor questions, general comment.

Previous to the virtual seminar, reports done by the three groups of students were assessed by HEI supervisors and the company representative. During the virtual seminar supervisors and the company representative assessed the quality of the presentations and how students answered the questions raised by the evaluators. According to the aforementioned criteria and the greatest potential for industrialisation, they the winning group was chosen.

3. Virtual seminar agenda

The final project presentation was planned to be on April 10, 2025, from 13.00 to 14.45 Fi/Ro time (12.00 - 13.45 Sp Time). The supervisors of Cluj-Napoca prepared the virtual room, and all participants (students, company representatives, and supervisors) were online. Each group had 20 minutes for the presentation, followed by approximately 10 minutes of question time.

4. Summary of the student reports

After completing the project presentation and the initial teamwork activities during the intensive week, the distance work phase was initiated. On March 7 and 21, 2025, two virtual meetings were planned to monitor the project’s evolution.

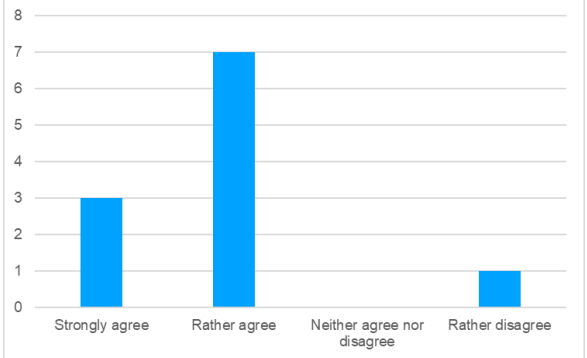
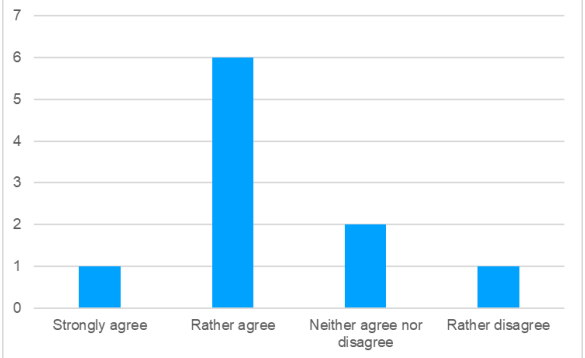
The students' reports were delivered four days after the final presentation and are attached as annexes to this report. The following bullets summarize the main results of the students:

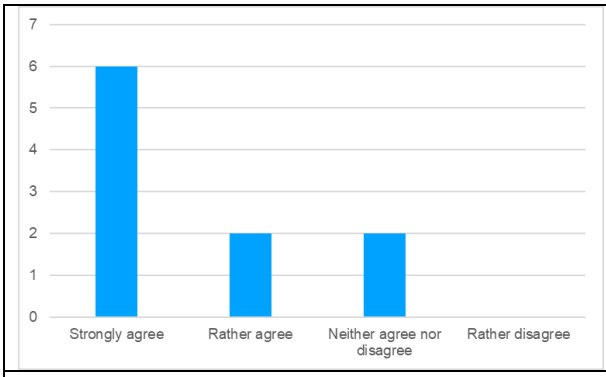
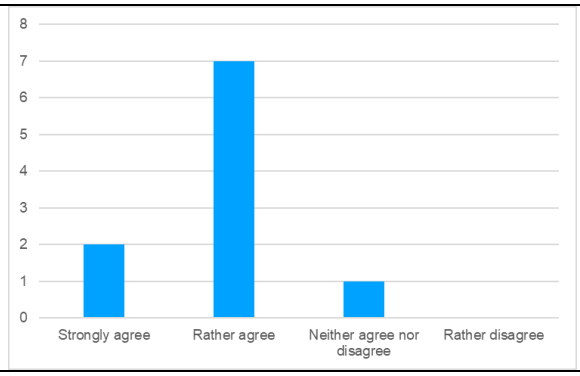
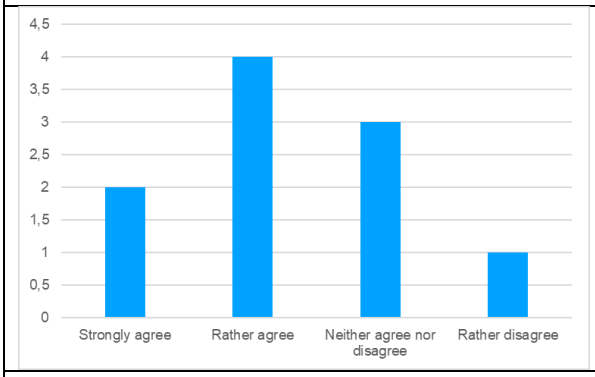
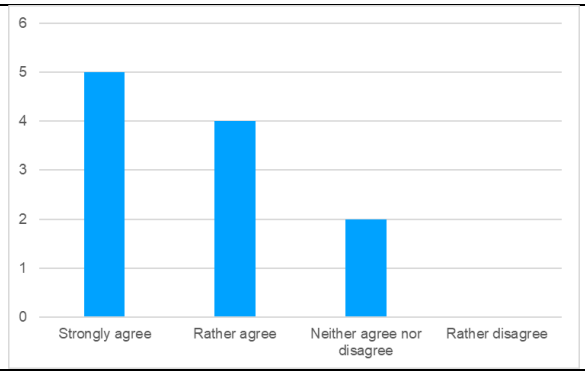
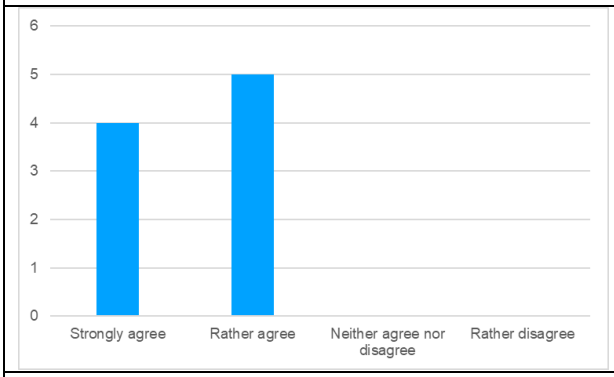
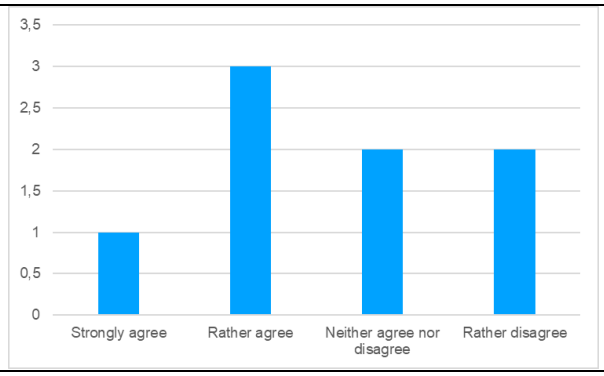
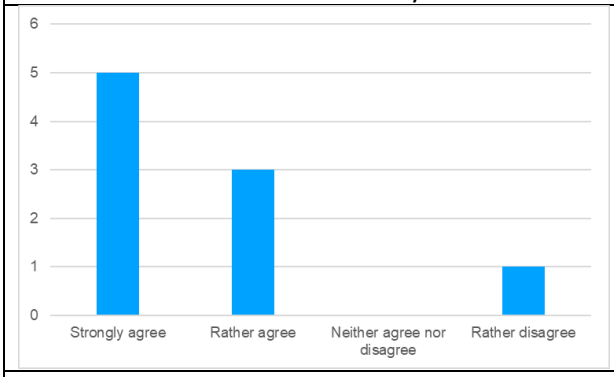
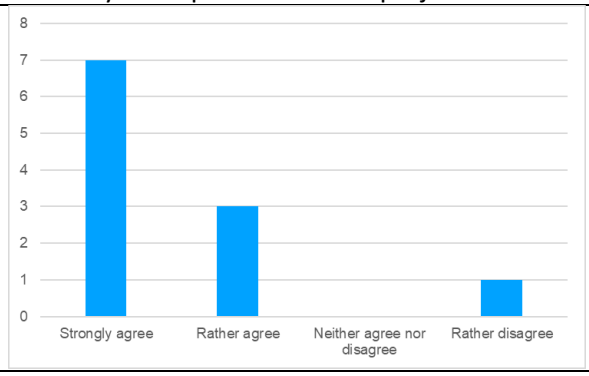
- Group A. They highlighted a tolerance issue as the main cause of screw failure before its adequate placement. To overcome this problem, this team proposed the use of an expensive and complex optical system for measuring the screws' dimensions. Problem identification and solution were not well substantiated, and the supervisors detected some weaknesses in the project planning and documentation (reports and presentations).
- Group B. The main cause of the detected problem was identified as friction, and the proposed solution was lubricated. This team conducted a detailed study of the problem and possible ways to implement the lubrication, which was considered an adequate but complex solution by supervisors and Bosch representatives.
- Group C. This team's project was considered the best and was chosen as the winner group by the company and supervisors. These students also identified the dimensional tolerances as the main issue for the tightening problem, but they developed a theory that supports that claim and provided a viable solution: increase the housing diameter.

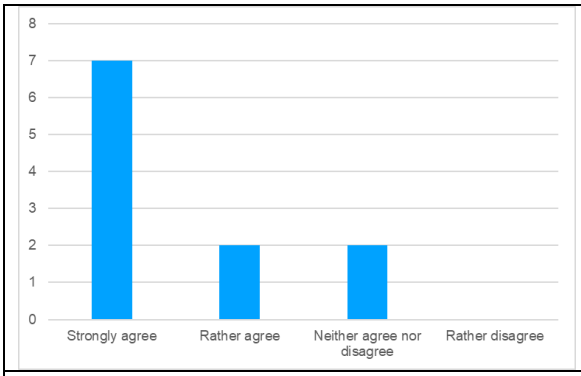
5. Survey and analysis of the CEL 4 implementation

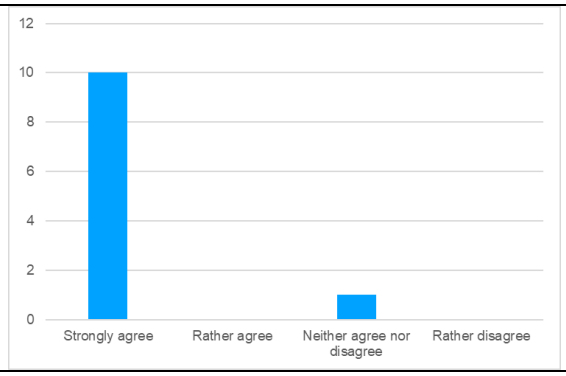
Two surveys were done to collect information about the CEL4 implementation: one for students and the other for supervisors. Eleven students, belonging to the three groups, answered the survey. The following figures show the students responses and comments:

Student's survey

The support by HEI-supervisors was helpful.	The support by the company/research group experts was helpful
	
The meeting times were sufficient	I met very often with my team members

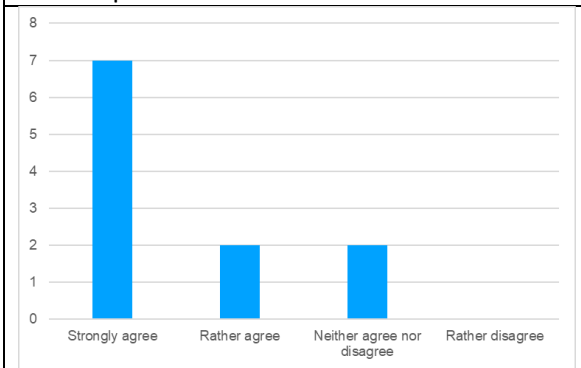
	
The work could be easily split.	The given ways to contact all other team members were sufficient.
	
The given ways to contact the HEI-supervisors were sufficient.	The given ways to contact the company-experts were sufficient.
	
I am satisfied with the work of my team.	I would you be part of another project.
	
I would recommend participation in this type of project to my fellow students.	This experience has helped me improve my soft skills (preparing and delivering presentations and teamwork).

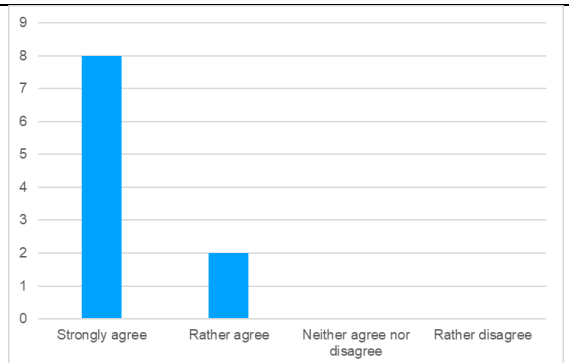




My technical competencies related to this project have improved.

Overall, I am satisfied with the experience





The students also gave the following ideas for improvement:

- More information about the problem. I wish we had been told before.
- It would be nice if all the students wanted to participate in the project, because some of the people did not participate at all or participate in a 1%.
- We challenged the development of each part, assigned to each participant, because the parts were developed in different times, one faster than others, and some challenges with the teamwork, but nothing really concerning.
- I found it a great experience, I would only suggest that when it comes to making the solution the organization should give the information to ensure that all teams start at the same point instead of having to find it online.
- A little more input data and process details from the company experts would be helpful.

And the top-points of what was really good:

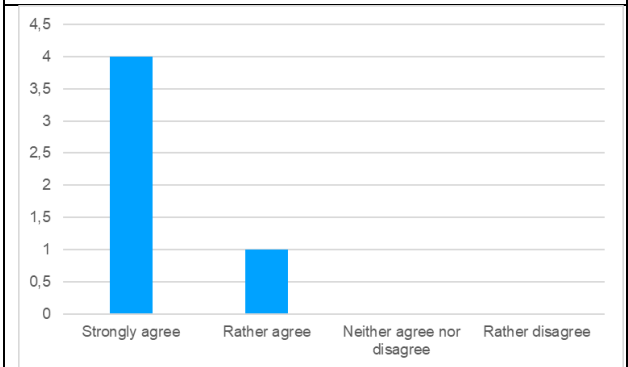
- The experience in Romania, working in an international group and working in a project with difficulties to apply in real life.
- The intensive week, the knowledge and soft skills gained during it and the possibility to work in a real project of a real (and big) company.
- The experience of meeting people, I like that the organization give us opportunities to interact with each other and something to promote for next years, the topic was really exciting, a real life problem and what is for me the thing the organization did best for the topic is that there is an achievable solution for students and the presentations are a good opportunity to develop soft skills and a good path to reach a solution for the problem.

- Communication in our team, help from the teachers that were involved in the project, organization in intensive week.
- The skills that I improve, meeting new people and work with a big company like Bosch.

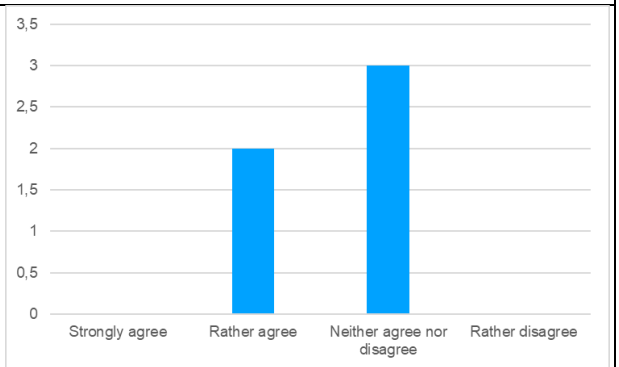
Some the students agreed that not all the members in the group were involved in the project work. They also suggested that more information about the project at the first stage of implementation would be helpful. Some of them also had difficulties in getting information and technical documentation. Despite of that most of them were satisfied with the experience.

HEI supervisors and company experts' opinions

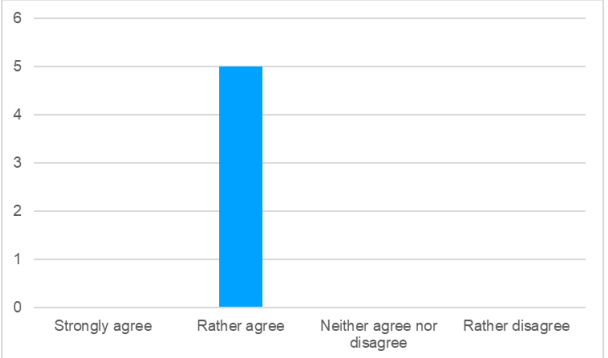
The timetable of distance project working was efficient



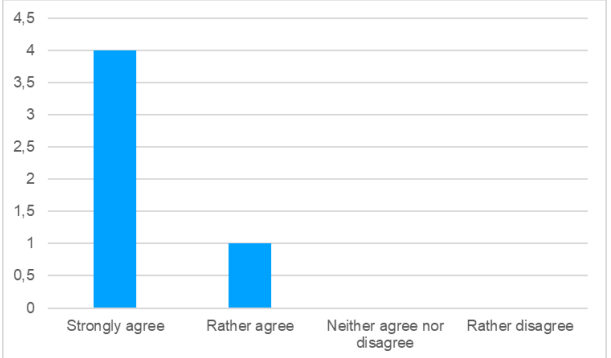
The final result of team A was good



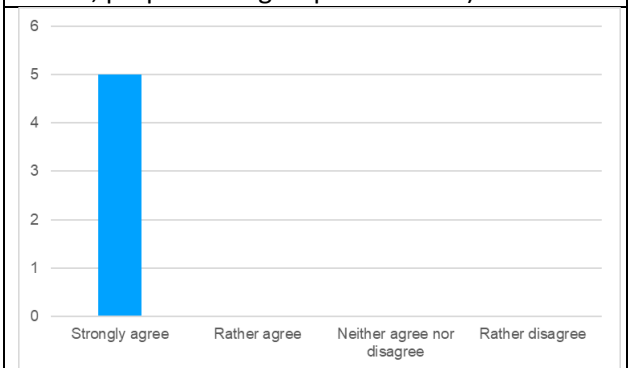
The final result of team B was good



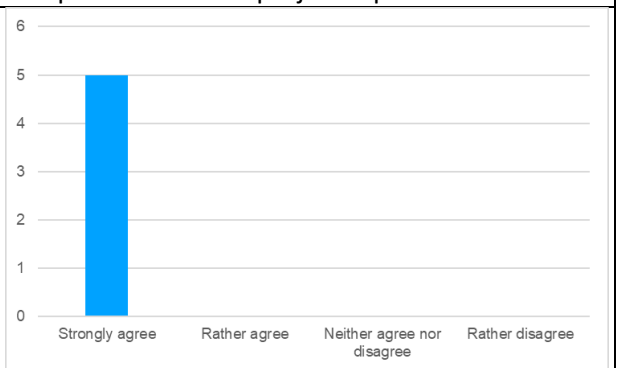
The final result of team C was good



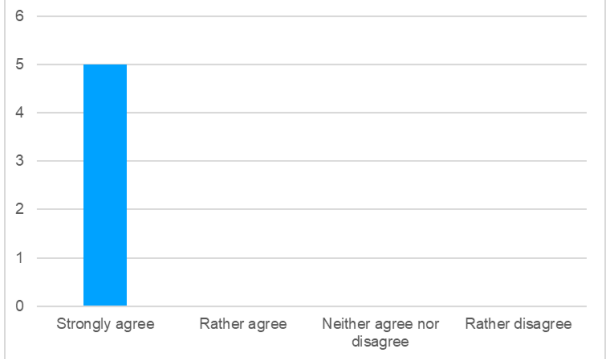
Students have improved their soft skills (work in teams, prepare and give presentation)



Students have improved their technical competences on the project topic



Overall, I am satisfied with the experience



Ideas of improvement, conflicts, challenges etc. referring to the distance working and the final report:

- Improve student selection by prioritizing highly motivated students.
- Longer period for distance work.

Top-3-points of what was really good:

- Address a real technical problem, international cooperation, HEI-supervisors.
- I was positively impressed by the strong bond and collaboration between the team members (especially in teams A and C) during the intensive week and distance work; this was clearly reflected in the project results and final presentation.
- International experts gathered together, interactive teaching - solving activities and improving skills, both technical and soft skills.

The improvement action proposed were: to improve student selection by prioritizing highly motivated students and longer period for distance work. The positive points were mainly related to address a real technical problem in an international context and the improvement of technical and soft skills.

6. Conclusion

Activities in the distance work and final virtual seminar were implemented as they were planned. Qualitative and quantitative indicators associated with this activity are presented in Table 1.

Table 1. Indicators and results associated with the activity A4.13.

Indicator code	Qualitative/Quantitative indicators	Result
Q1	- 50% of participant students gave positive feedback on CEL project activities, teachers involvement and company/research group experts interaction	**- achieved 100%** *Details:* - 90.9 % of the students were strong or rather agree about the HEI-supervisors support. - 63.6% were strong or rather agree about the company/research group experts support.

Q2	- 90% of the involved students pass the final CEL project assessment	**- achieved 100%** *Details:* - 100% of the involved students pass the final CEL project assessment
Q3	- 70 % of the students have improved their soft skills (work in teams, prepare and give presentations etc.)	**- achieved 100%** *Details:* - 100% of the **supervisors** were strong agree that students have improved their soft skills (work in teams, prepare and give presentations etc.)
Q4	- 70 % of the students have improved their technical competences on the project topic	**- achieved 100%** *Details:* - 100% of the **supervisors** were strong agree that students have improved their technical competences on the project topic
Q5	- all (100%) participating students have work in international teams	**- achieved 100%** *Details:* - 100% worked international teams
Q6	- 1 report on CEL4-Bosch project implementation	**- achieved 100%** *Details:* - **1 report**: R4.13.a Report of CEL4-Bosch project implementation
Q7	- 1 virtual seminar (3 in total for each CEL in round 2)	**- achieved 100%** *Details:* **- 1 virtual seminar for CEL4 held on April 2025**

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CASES FOR EXPERIENTIAL LEARNING PROJECTS

R4.13 b

Report of CEL5- Jamk and Valmet Project evaluation

July, 2025

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Short Description	The report includes CEL5 evaluation criteria, the agenda for the virtual seminar, s summary of the three students' reports, and the feedback survey
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Table of Contents

1. Introduction

The aim of the report is to detail the evaluation procedure of one of the CEL projects developed during the second round, the CEL5- Jamk and Valmet project. The Valmet company (Finland) proposed the topic: "Automatic or semi-automatic cleaning to be developed for the blade change device" which its main objective was to design a "cleaning ability" for a blade changing device and was implemented from February to April 2025. It started with the intensive week (activities detailed in R4.11) where students received tailored seminars and planned the distance working. At the end of April, students presented the result of their work in a virtual seminar. This report summarizes how the assessment of CEL5- Jamk and Valmet project was done. It includes the evaluation criteria, the virtual seminar agenda, a summary of the students reports and their assessment results. Finally, an analysis of the surveys responses for the target groups is also presented.

This report is the result of the activity: A4.13. Reports and second round evaluation. Final presentations, done by the students during the virtual seminar, are included as annexes.

2. CEL 5 evaluation criteria

The HEIs supervisors and Valmet representatives agreed on the evaluation criteria to be applied during the virtual seminars. The groups of students were assessed according to:

- Reports evaluation: strenghts, weaknessess, general overview.
- Presentation: content, length, development, answer to supervisor questions, general comment.

Previous to virtual seminars, reports done by the three groups of students were assessed by HEI supervisors and the company representative. During the last virtual seminar supervisors and the company representative assessed the quality of the presentations and how students answered the questions raised by the evaluators. According to the aforementioned criteria and the greatest potential for industrialisation, they the winning group was chosen.

3. Virtual seminar agenda

The three virtual seminars were held on the following dates:

- March, 6th 2025 from 12:00 – 13:30 (SP time), 13:00 – 14:30 (FI and RO time).
- March, 21st 2025 from 12:00 – 13:30 (SP time), 13:00 – 14:30 (FI and RO time).
- April, 11th 2025 from 12:00 – 13:30 (SP time), 13:00 – 14:30 (FI and RO time).

During the first and second virtual seminars, students had 20-minute slots to present their progress to HEI supervisors and VALMET representatives. They received feedback based on the current state of their

work, which they were expected to implement before the next seminar. In the final virtual seminar, held on April 11th, 2025, each student group delivered a 20-minute final presentation, folowed by a Question & Answer session with HEI supervisors and VALMET experts.

Figure 1: Two slides extracted from the finatl presentation by Student Team 1

4. Summary of the student reports

The three group of students developed different alternatives for the blade changing device (task entitled: Automatic or semi-automatic cleaning to be developed for the blade change device).

Team 1 (Winning Team):

Team 1 focused on developing an innovative "Doctor Blade" cleaning mechanism through a modular dual-scraper system. They explored three main concepts: a simple static blade, an oscillating blade inspired by motor mechanisms, and a rotating brush system. The team evaluated each concept in terms of cost, complexity, energy consumption, effectiveness, and ease of maintenance. The design of their scraper was a critical consideration, ensuring its profile maintained continuous contact with the "Doctor Blade" across all wear states and that it was at an optimal angle for waste evacuation. They also ensured the scraper could be cut from sheet material for ease of manufacturing and adaptability, considering high-temperature plastics and stainless steel for durability. Their final design shown in Fig. 2 incorporated the possibility to be integrated with a vacuum system for waste removal, which, despite its complexity, laid the foundation for developing a robust and adaptable solution.

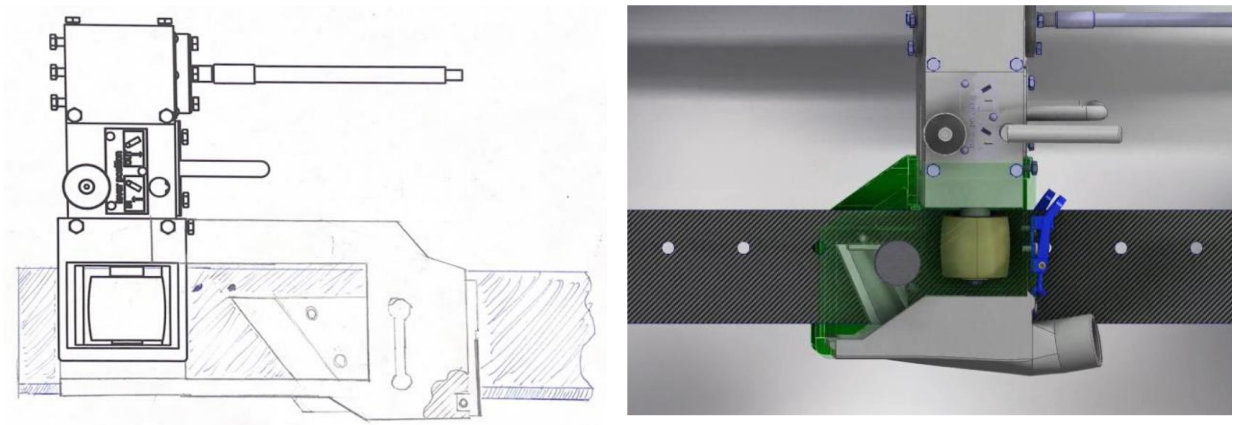


Figure 2: First draft and final design proposed by Student Team 1

Team 2:

Team 2 addressed the modification of the cleaning mechanism for Valmet's machinery used in paper and board production, specifically focusing on the "Doctor Cleaning Blade" to manage dirt like dust and moisture on rollers and cylinders. Individually, members proposed various ideas, which were then shared and developed collectively, analyzing the advantages and disadvantages of each potential solution. The team explored multiple approaches, including a mechanism that creates a small cleaning blade that follows the edge of the "Doctor Blade" to adapt to its roughness, a fixed blade design with plastic support that modifies the protection to insert two small blades and support structures aiming to achieve uniform reaction forces and prevent bending, a self-adjusting blade that uses flaps to guide and control the cleaning movement, and a concept based on a Dremel tool mounted on a stand for scraping off dirt. Through a decision-making process, they selected the fixed blade with plastic support design as the most viable option, which integrates a vacuum cleaner into the safety casing to prevent debris accumulation on the roller and simplifies waste removal with a removable collection container. They also 3D-printed the final design for a clearer interpretation of their solution.

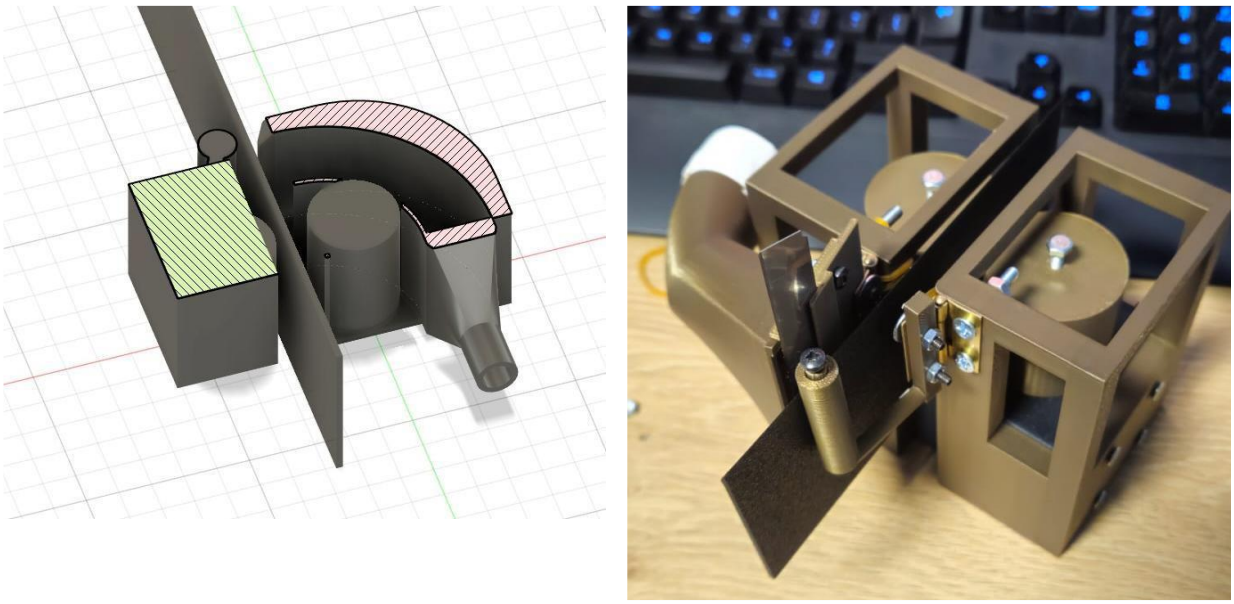


Figure 3: First draft and final design (3D printed) proposed by Student Team 2

Team 3:

Team 3 focused on creating a solution to automatically or semi-automatically clean the "Doctor Blade". The team was encouraged to build their solution around an existing device that had already been designed to remove the "Doctor Blade" using silicone rollers and the torque of a drill. They explored both passive and active cleaning solutions, leading to three main concepts: a simple static blade that maintains contact with the dirty surface, an oscillating blade inspired by motor mechanisms, and a cylindrical rotating brush system for continuous debris removal (shown in Fig. 4). Each concept was evaluated for its cost, complexity, energy consumption, effectiveness, and ease of maintenance. Their final proposed concept, following Valmet's hierarchy of preferences and their own evaluations, is a blade housing assembly that mounts onto the existing bearing mechanism. This design integrates a replaceable cleaning blade and uses

a spring-actuated piston mechanism to ensure constant and adaptable pressure, compensating for blade wear and allowing for quick and reliable exchange.

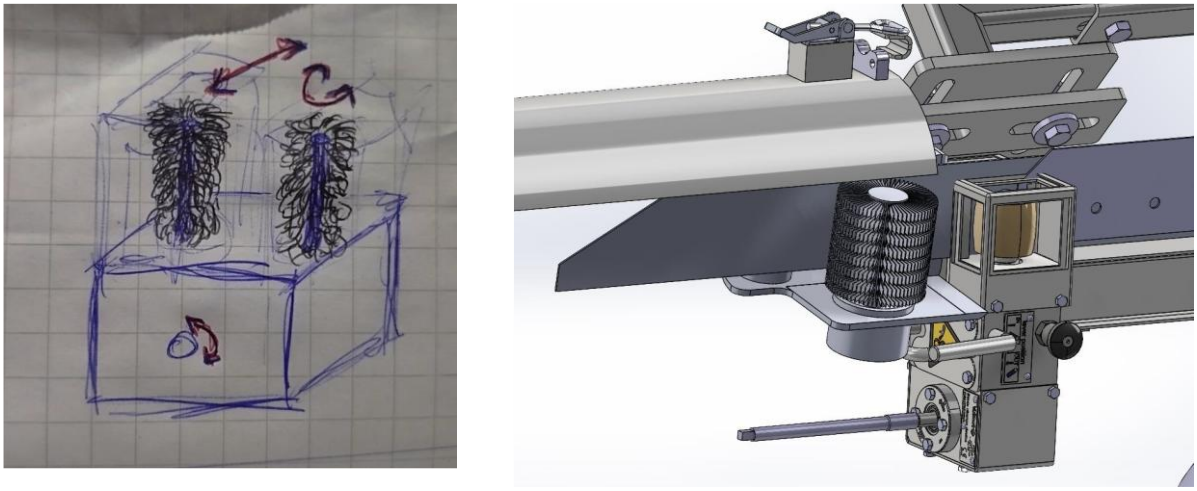


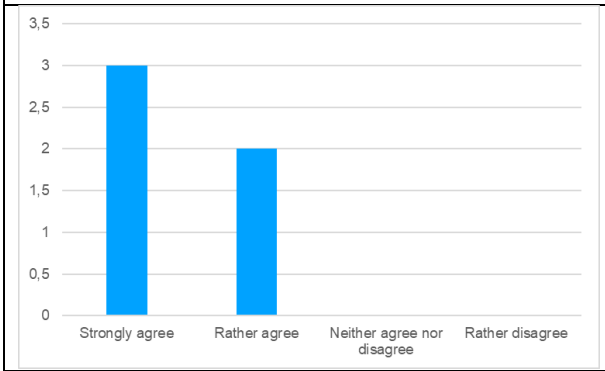
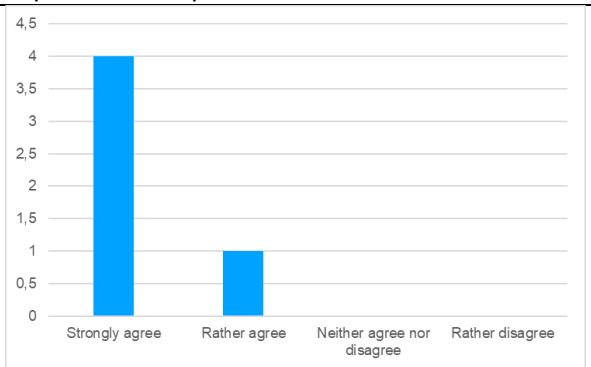
Figure 4: Draft and design of one of the three cleaning devices proposed by Student Team 3

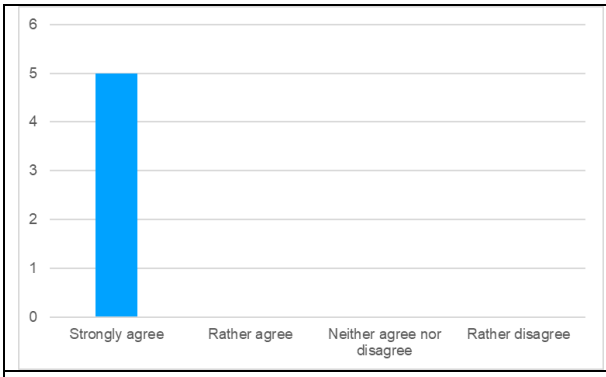
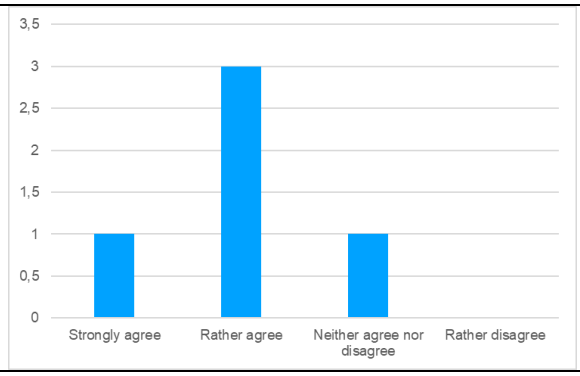
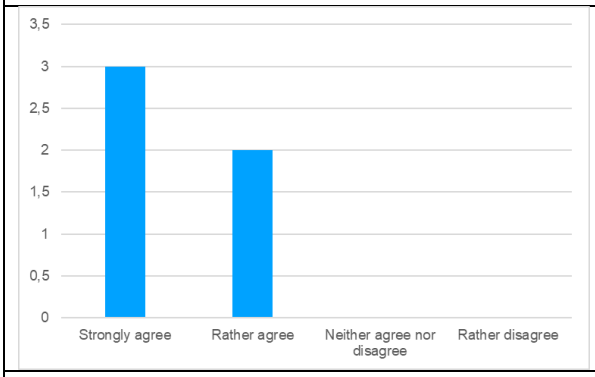
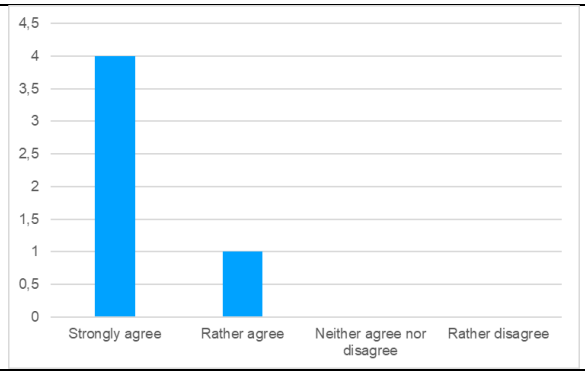
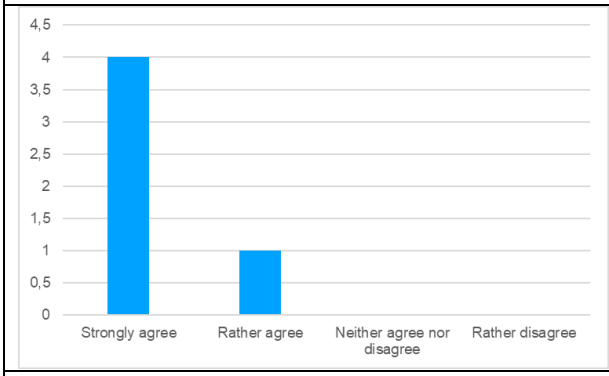
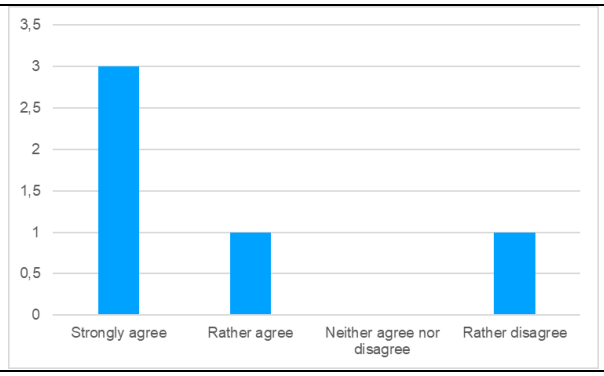
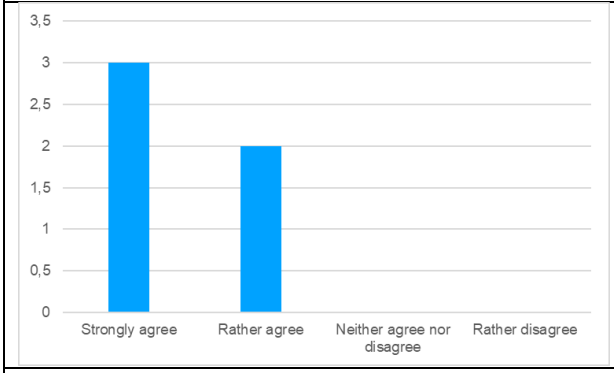
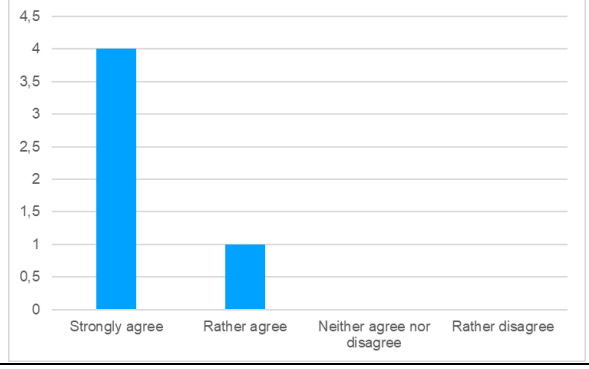
The work developed by all three student groups demonstrates commitment to innovation and problem-solving. Their collaborative efforts and application of engineering principles resulted in well-conceived solutions for the blade changing device concept, showcasing their ability to tackle complex industrial challenges effectively within an international cooperation framework.

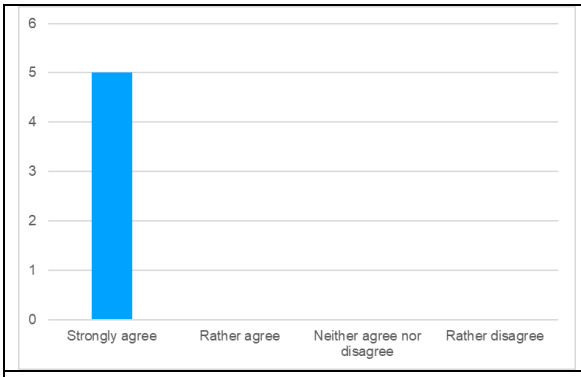
5. Survey and analysis of the CEL 5 implementation

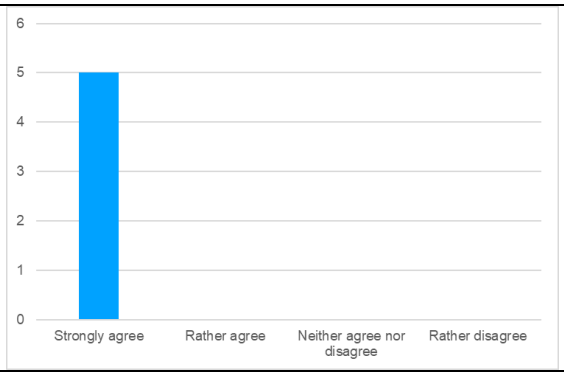
Two surveys were done to collect information about the CEL5 implementation: one for students and other for supervisors. Five students, belonging to the A and B groups, answered the survey. The following figures show the students responses and comments:

Student's survey

The support by HEI-supervisors was helpful.	The support by the company/research group experts was helpful
	
The meeting times were sufficient	I met very often with my team members

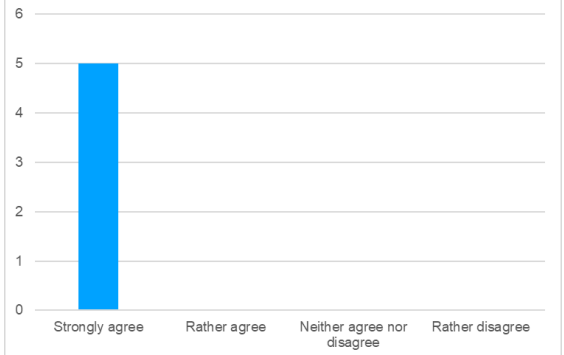
	
The work could be easily split.	The given ways to contact all other team members were sufficient.
	
The given ways to contact the HEI-supervisors were sufficient.	The given ways to contact the company-experts were sufficient.
	
I am satisfied with the work of my team.	I would you be part of another project.
	
I would recommend participation in this type of project to my fellow students.	This experience has helped me improve my soft skills (preparing and delivering presentations and teamwork).

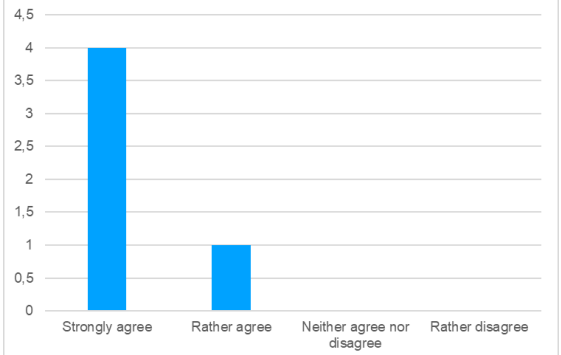




My technical competencies related to this project have improved.

Overall, I am satisfied with the experience





One student also gave the following idea for improvement:

- I really liked the whole challenge of understanding the concept and coming up with the solution.

And the top-points of what was really good:

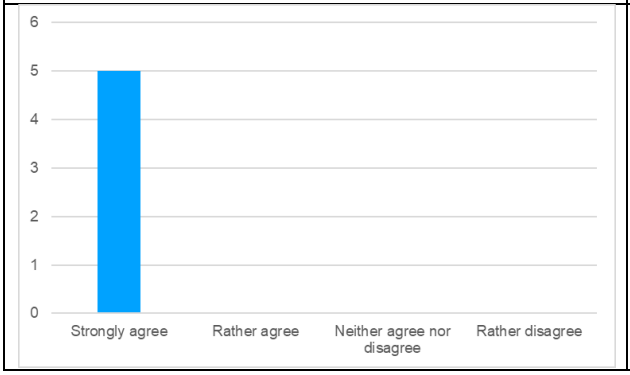
- 1. Teamwork 2. Challenging task 3. Learning.
- The communication with Valmet and Siistone Matti's feedback and insights as well as Tommi's. In general Finland's welcoming spirit. The overall program was nice.

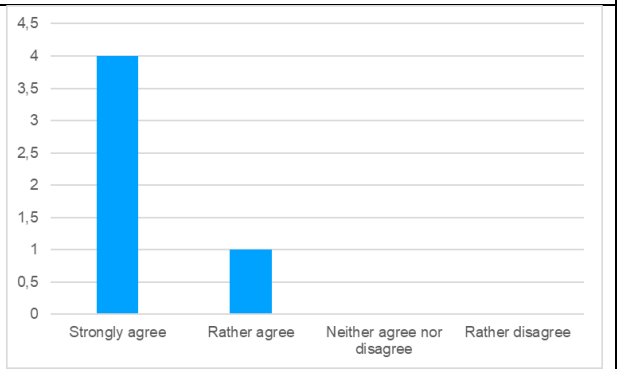
Although not many of the participating students responded to the survey, the comments are very positive.

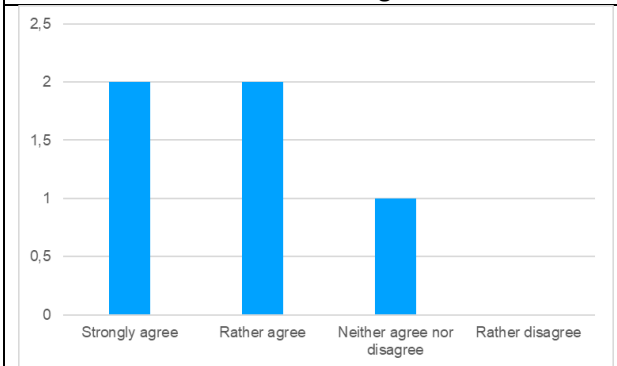
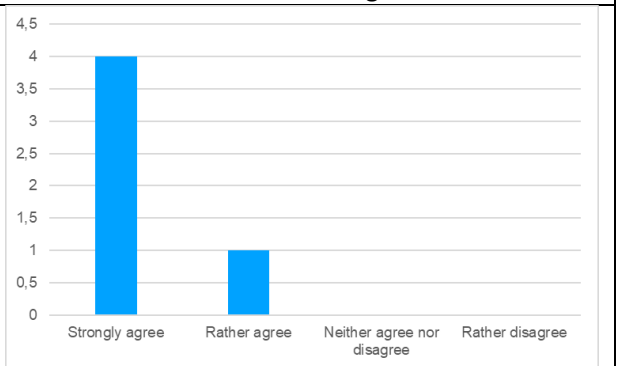
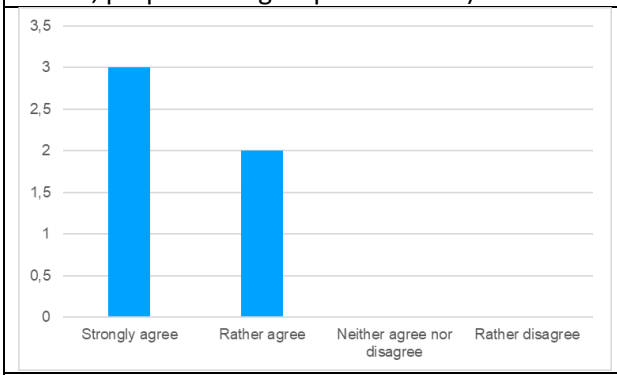
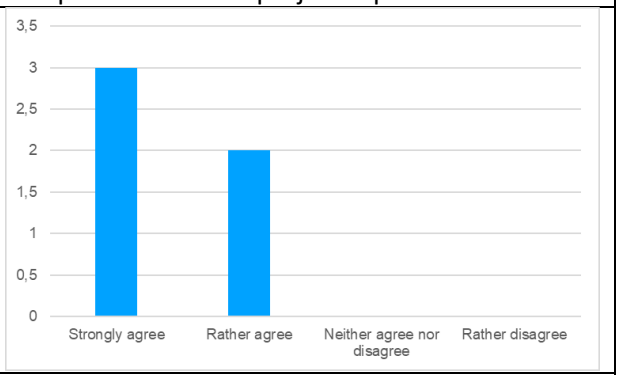
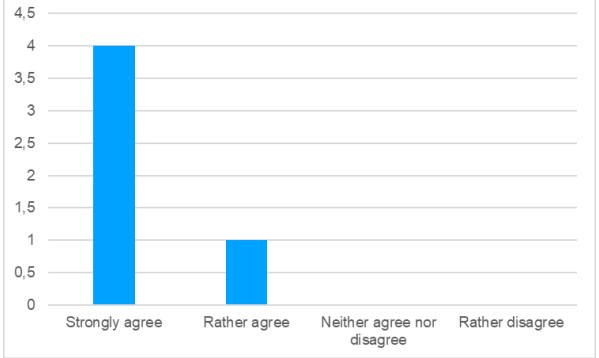
HEI supervisors and company experts' opinions

The timetable of distance project working was efficient

The final result of team A was good





The final result of team B was good	The final result of team C was good
	
Students have improved their soft skills (work in teams, prepare and give presentation)	**Students have improved their technical competences on the project topic**
	
Overall, I am satisfied with the experience	
	

Ideas of improvement, conflicts, challenges etc. referring to the distance working and the final report:

- In group B, some students experienced partly lack of collaboration which lead to a non-definitive final solution in the final presentation meeting. Regardless of this issue, the proposed task was perfect for the goal of the project. The other groups developed deep collaboration and reached very good conclusions. I would keep interesting tasks like the one VALMET proposed to keep the great quality of the experience.
- The work of the three groups during the intensive week was excellent. They coordinated and worked very well as a group. During the online work weeks, this wasn't the case for all groups. There was one group where they couldn't work together and each did what they wanted. Perhaps some training on remote group work would have been helpful.
- Would be a good idea to receive presentation materials a little advance before meetings.

Top-3-points of what was really good:

- Interaction with VALMET, teamwork, Finland.
- (1) Valmet presented an excellent task proposal that was both engaging and motivating for the students; (2) the intensive week significantly enhanced students' ability to work in collaborative environments; (3) the intensive week also offered a broad perspective on cultural integration among students from different higher education institutions.
- The experience of collaborative work in international groups was very positive. Solving a real-life problem proposed by a company was motivating for the students. Working in a language other than your own with people from different cultures was a difficult but rewarding challenge.
- Different ideas were well compared (Election charts). Nice animations.

The improvement action proposed was: to receive presentation materials a little advance before meetings. The positive points were mainly related to the company and the team work.

6. Conclusion

Activities in the distance work and final virtual seminar were implemented as they were planned. Qualitative and quantitative indicators associated with this activity are presented in the Table 1.

Table 1. Indicators and results associated with the activity A4.13.

Indicator code	Qualitative/Quantitative indicators	Result
Q1	- 50% of participant students gave positive feedback on CEL project activities, teachers involvement and company/research group experts interaction	**- achieved 100%** *Details:* - 100 % of the students were strong or rather agree about the HEI-supervisors support. - 100% were strong or rather agree about the company/research group experts support.
Q2	- 90% of the involved students pass the final CEL project assessment	**- achieved 100%** *Details:* - 100% of the involved students pass the final CEL project assessment
Q3	- 70 % of the students have improved their soft skills (work in teams, prepare and give presentations etc.)	**- achieved 100%** *Details:* - 100% of the **supervisors** were strong or rather agree that students have improved their soft skills (work in teams, prepare and give presentations etc.)
Q4	- 70 % of the students have improved their technical competences on the project topic	**- achieved 100%** *Details:* - 100% of the **supervisors** were strong or rather agree that students have improved their technical competences on the project topic

Q5	- all (100%) participating students have work in international teams	**- achieved 100%** *Details:* - 100% worked international teams
Q6	- 1 report on CEL5-JAMK and Valmet project implementation	**- achieved 100%** *Details:* - **1 report**: R4.13.b Report of CEL5- Jamk and Valmet project implementation
Q7	- 1 virtual seminar (3 in total for each CEL in round 2)	**- achieved 100%** *Details:* **- 1 virtual seminar for CEL5 held on April 2025**

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NextGEng

Project title	International Cooperation Framework for Next Generation Engineering Students
Project acronym	NextGEng
Project contract no.	2022-1-RO01-KA220-HED-000088365

NextGEng Project

WORK PACKAGE 4

CASES FOR EXPERIENTIAL LEARNING PROJECTS

R4.13 c

Report of CEL6-UJA RG Project evaluation

July, 2025

TECHNICAL UNIVERSITY OF CLUJ-NAPOCA

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Valmet

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WP4	R4.13.c Report of CEL6-UJA RG Project evaluation
Authors	Francisca María Guerrero Villar
Short Description	The report includes CEL6 evaluation criteria, agenda for the virtual seminar, summary of the three students reports, feedback survey
Status	Final
Distribution level	Public
Date of delivery	17/07/2025
Contributions by:	
Project website	www.nextgeng.eu

Document History

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0.3	23/07/2025	Francisca María Guerrero Villar	Second Draft
Final	24/07/2025	Silvia Satorres Martínez	Final Version

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

Table of Contents

1. Introduction

The aim of the report is to detail the evaluation procedure of one of the CEL projects developed during the second round, the CEL6-UJA RG project. The research group of the University of Jaén: MECHANICAL AND ENERGY ENGINEERING (TEP-250), proposed the topic: "Products redesign via Additive Manufacturing (AM)", which was implemented from February to April 2025. It started with the intensive week (activities detailed in R4.12) where students received tailored seminars and planned the distance working. At the end of April, students presented the result of their work in a virtual seminar. This report summarizes how the assessment of CEL6-UJA RG project was done. It includes the evaluation criteria, the virtual seminar agenda, a summary of the students reports and their assessment results. Finally, an analysis of the surveys responses for the target groups is also presented.

This report is the result of the activity: A4.13. Reports and second round evaluation. Final presentations, done by the students during the virtual seminar, are included as annexes.

2. CEL 6 evaluation criteria

The HEIs supervisors and UJA RG representative agreed on the evaluation criteria to be applied during the virtual seminar. The groups of students were assessed according to:

- Reports evaluation: strenghts, weaknessess, general overview.
- Presentation: content, length, development, answer to supervisor questions, general comment.

Previous to the virtual seminar, reports done by the three groups of students were assessed by HEI supervisors and the RG representative. During the virtual seminar supervisors and RG representative assessed the quality of the presentations and how students answered the questions raised by the evaluators. According to the aforementioned criteria and the greatest potential for industrialisation, then the winning group was chosen.

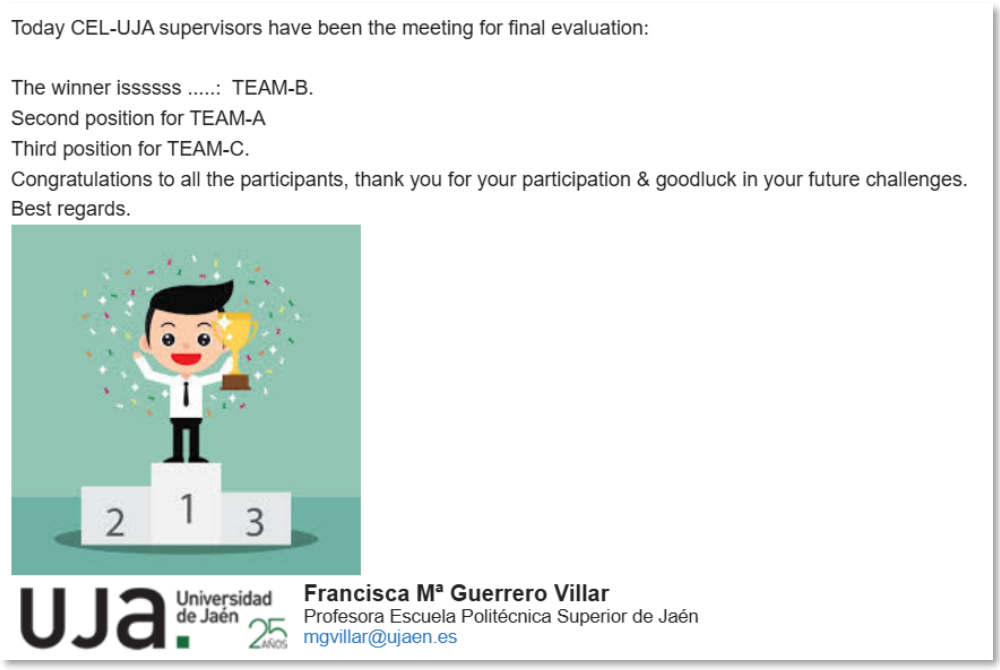


Fig. 1. Final assess advertisement

3. Virtual seminar agenda

CEL6-UJA RG project virtual seminars was held on:

Table. 1. Virtual seminar agenda

FIRST FOLLOW UP SEMINAR		SECOND FOLLOW UP SEMINAR		FINAL EVALUATION SEMINAR		FINAL ASSEESSING MEETING Supervisors and RG	
Friday, 7th of March 2025 (Time: UTC+2)		Friday, 21st of March 2025 (Time: UTC+2)		Friday, 11st of April 2025 (Time: UTC+1)		Monday, 28th of April 2025 (Time: UTC+1)	
9:15	Team A	9:30	Team A	9:30	Team A	11:00 - 11:30	Assess delivering
10:30	Team B	10:00	Team B	10:00	Team B		
Tuesday, 11th of March 2025 (Time: UTC+2)		10:30	Team C	10:30	Team C		
11:00	Team C						

The format for the sessions were video calls with “Google Meet”, the team leaders was compusory, and another members team was free to join at the follow up meeting sessions. The *figures 2* till *4* show screen shoots of these events.

The final evaluation seminar sessions were held in “Google Meet” too, but on that occasion, all the teams members was invited, as can be seen in *figure 5*.

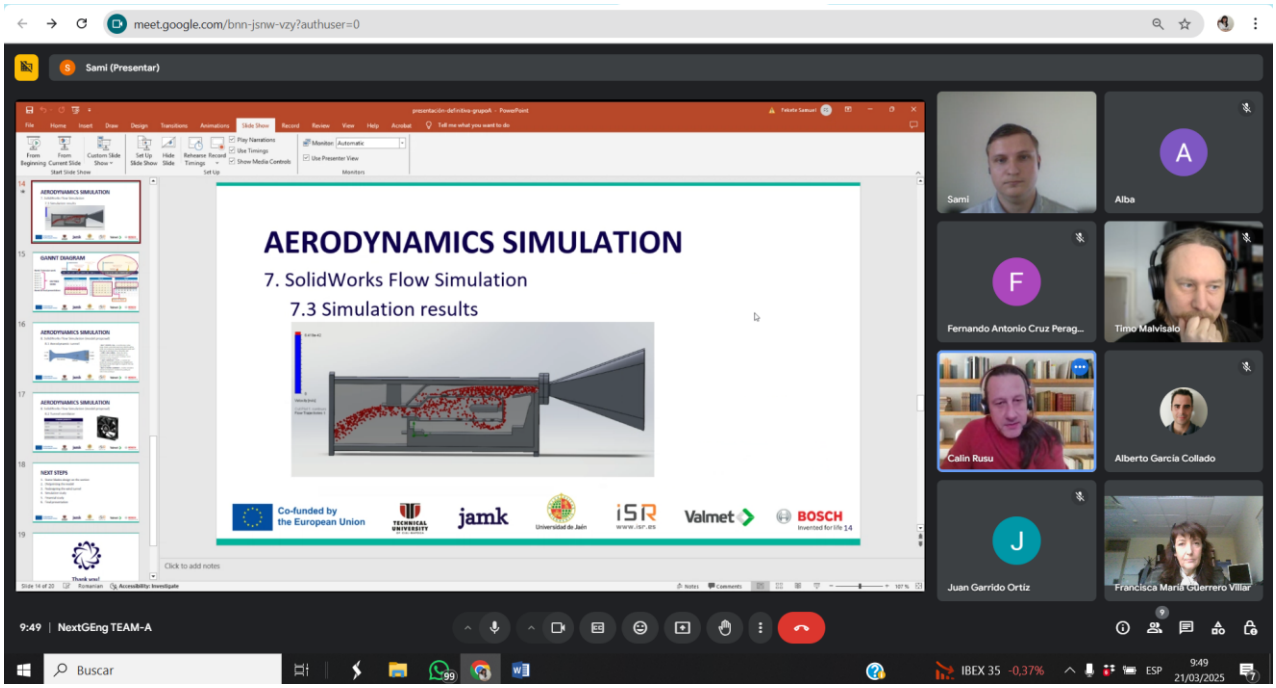


Fig. 2. Virtual Second follow up seminar, Team A

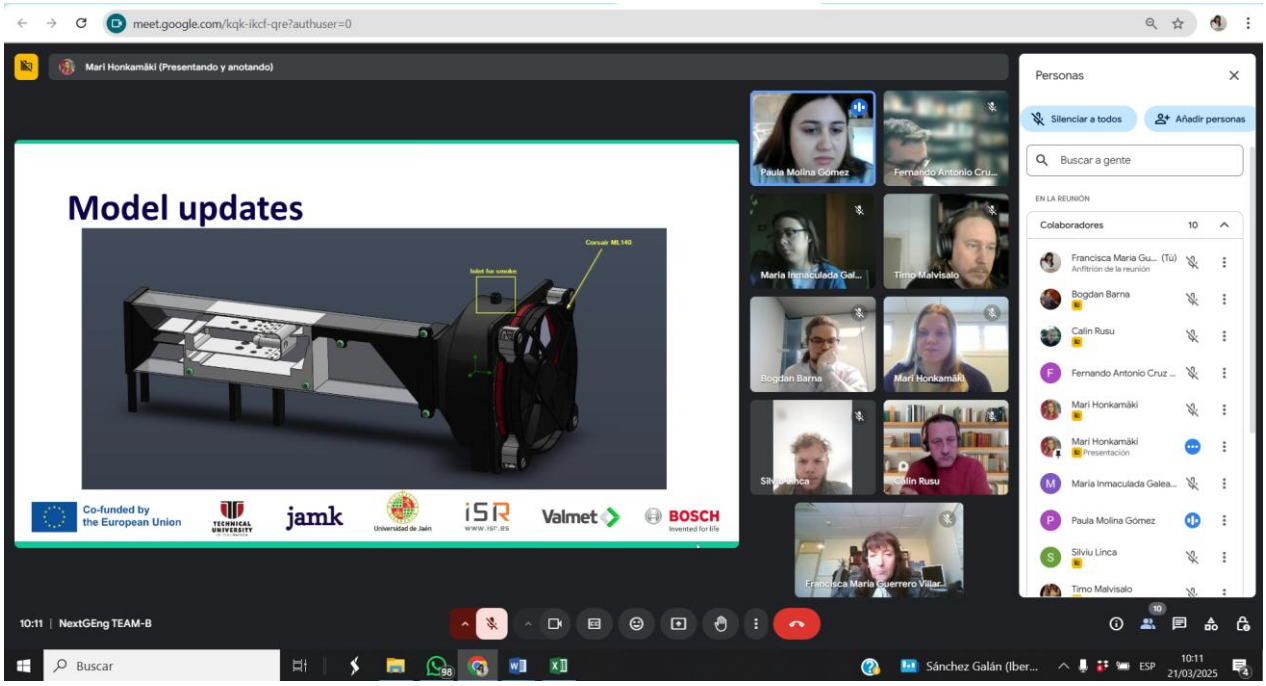


Fig. 3. Virtual Second follow up seminar, Team B

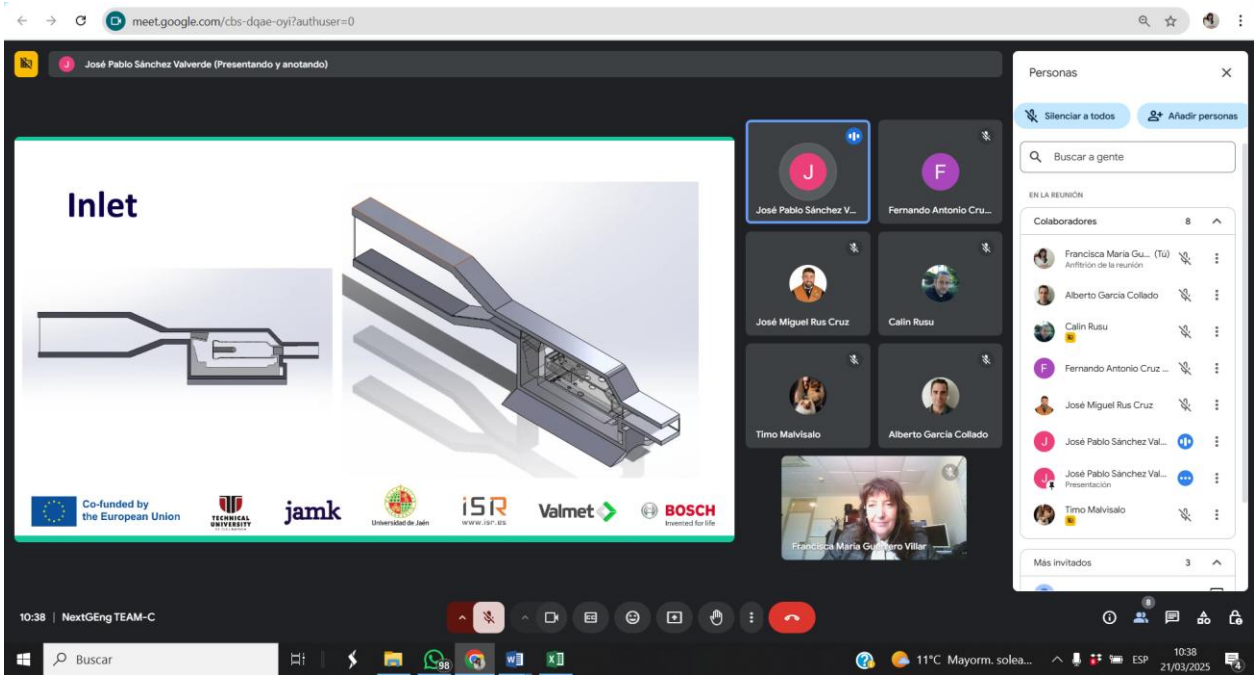


Fig. 4. Virtual Second follow up seminar, Team C

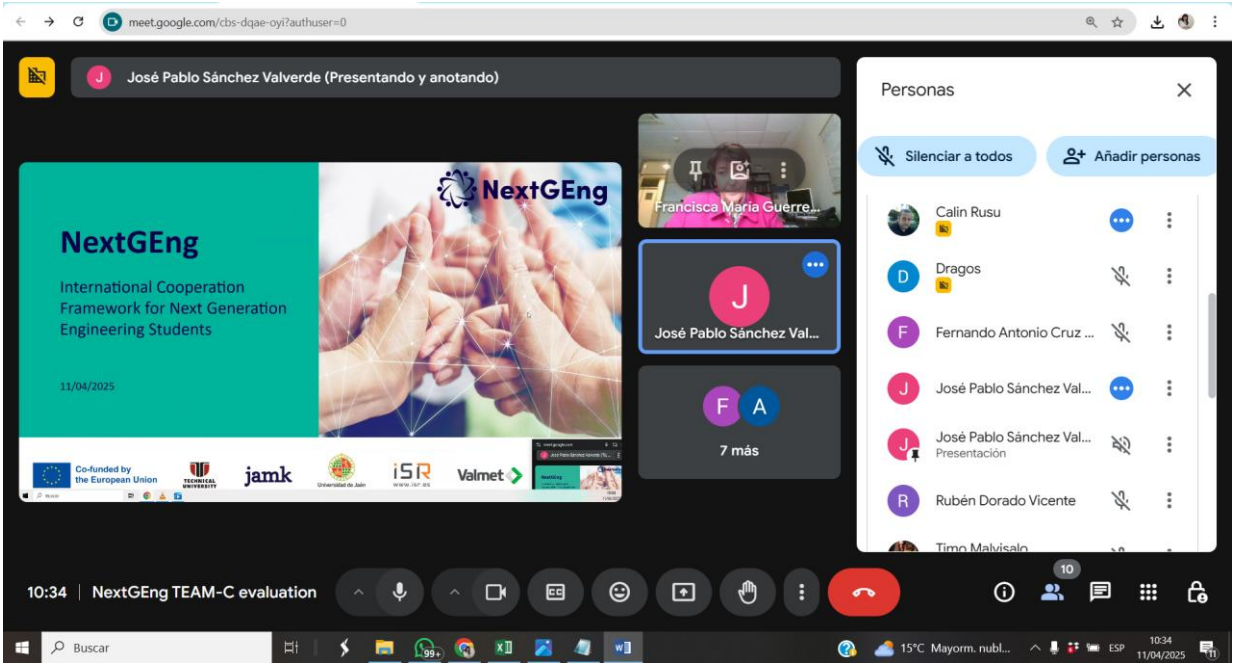


Fig. 5. Virtual Final Evaluation seminar, Team C

4. Summary of the student reports

The students' reports and presentations were delivered 24 hours before virtual seminar. All of them were uploaded into a Drive folder shared with all the CEL Project supervisors. The final teams CEL6-UJA reports have been included as annexes at the present document.

Below is provided a brief summary of some important goals achieved by students.

Team A, developed an interesting computer simulation, based on DEM (Discrete Element Method) computer simulation, as shown in *figure 6*.

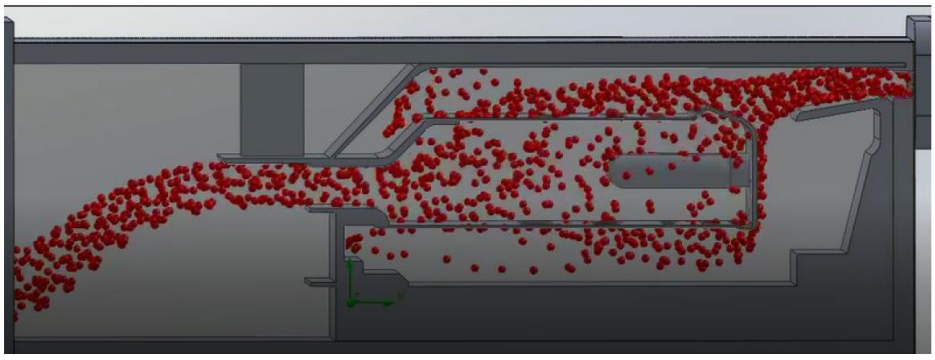


Fig. 6. DEM computer simulation by Team A.

Team B did a very complete analysis of the study problem (see *figure 7*), including a transparency study of printed part.

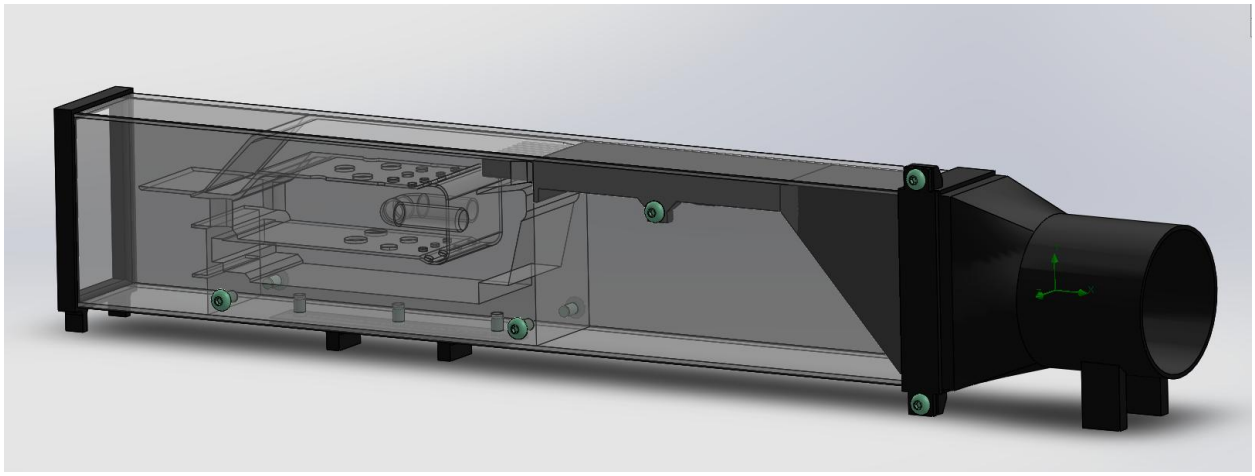


Fig. 7. Complete mockup developed by Team B.

Team C, worked with several simulations based on CFD programs (fluid dynamics finite volume method). *Figure 8* shows screenshots of some iterations.

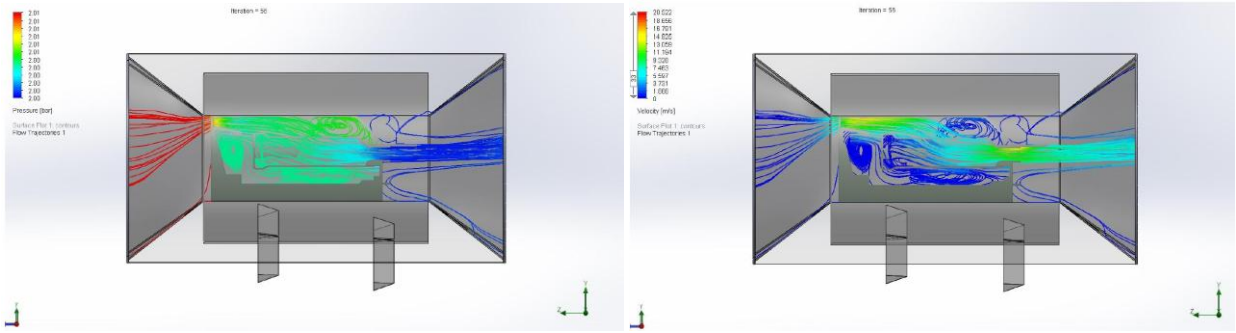


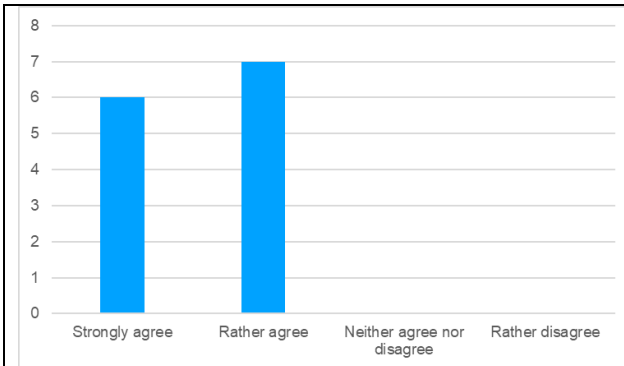
Fig. 8. CFD analysis by Team C.

5. Survey and analysis of the CEL 6 implementation

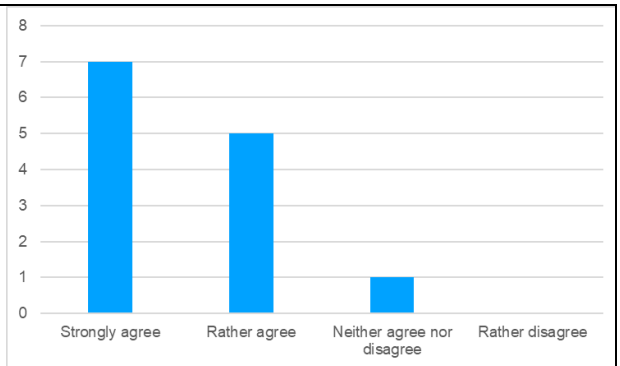
Two surveys were done to collect information about the CEL6 implementation: one for students and other for supervisors. Thirteen students, belonging to the three groups, answered the survey. The following figures show the students responses and comments:

Student's survey

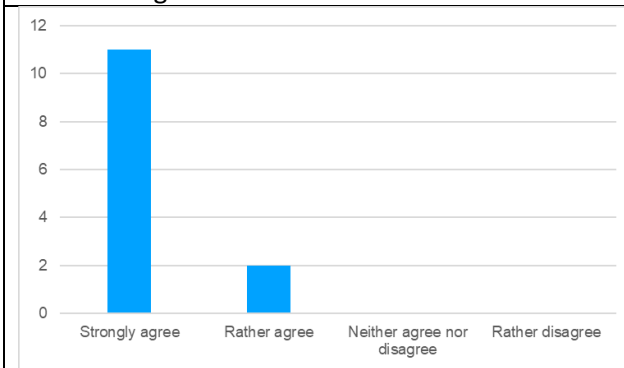
The support by HEI-supervisors was helpful.	The support by the company/research group experts was helpful



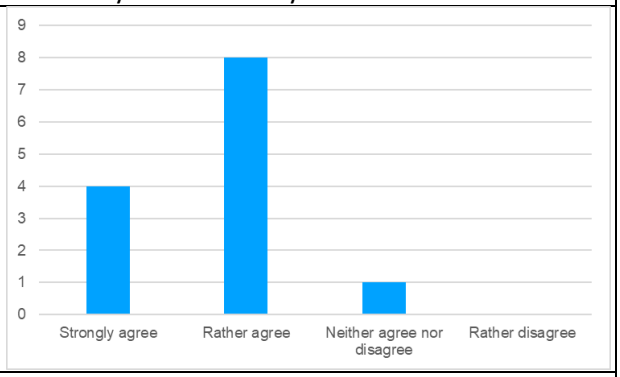
The meeting times were sufficient



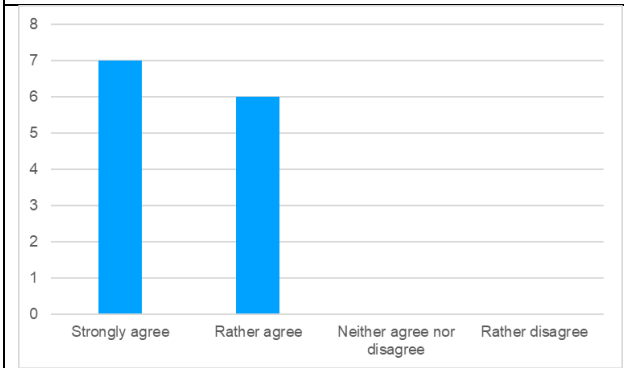
I met very often with my team members



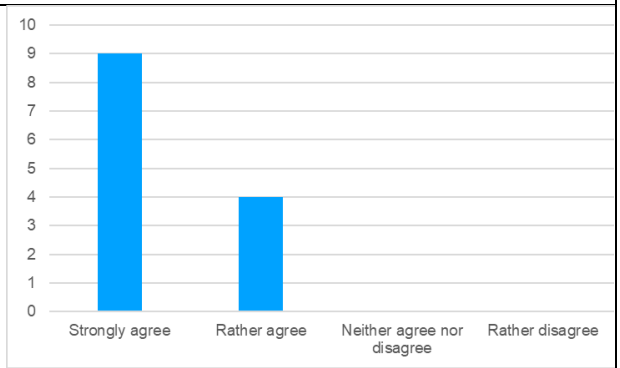
The work could be easily split.



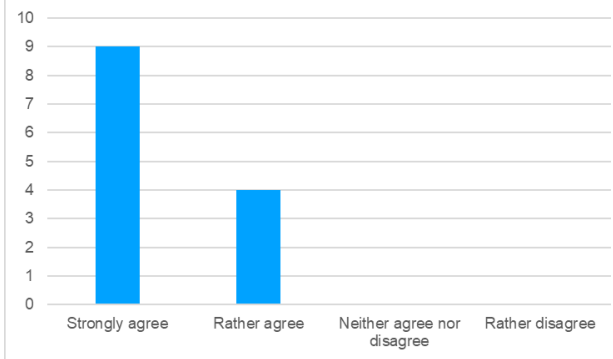
The given ways to contact all other team members were sufficient.



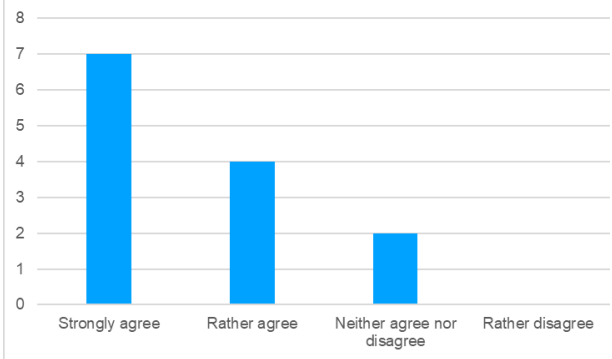
The given ways to contact the HEI-supervisors were sufficient.



The given ways to contact the company-experts were sufficient.



I am satisfied with the work of my team.



I would you be part of another project.

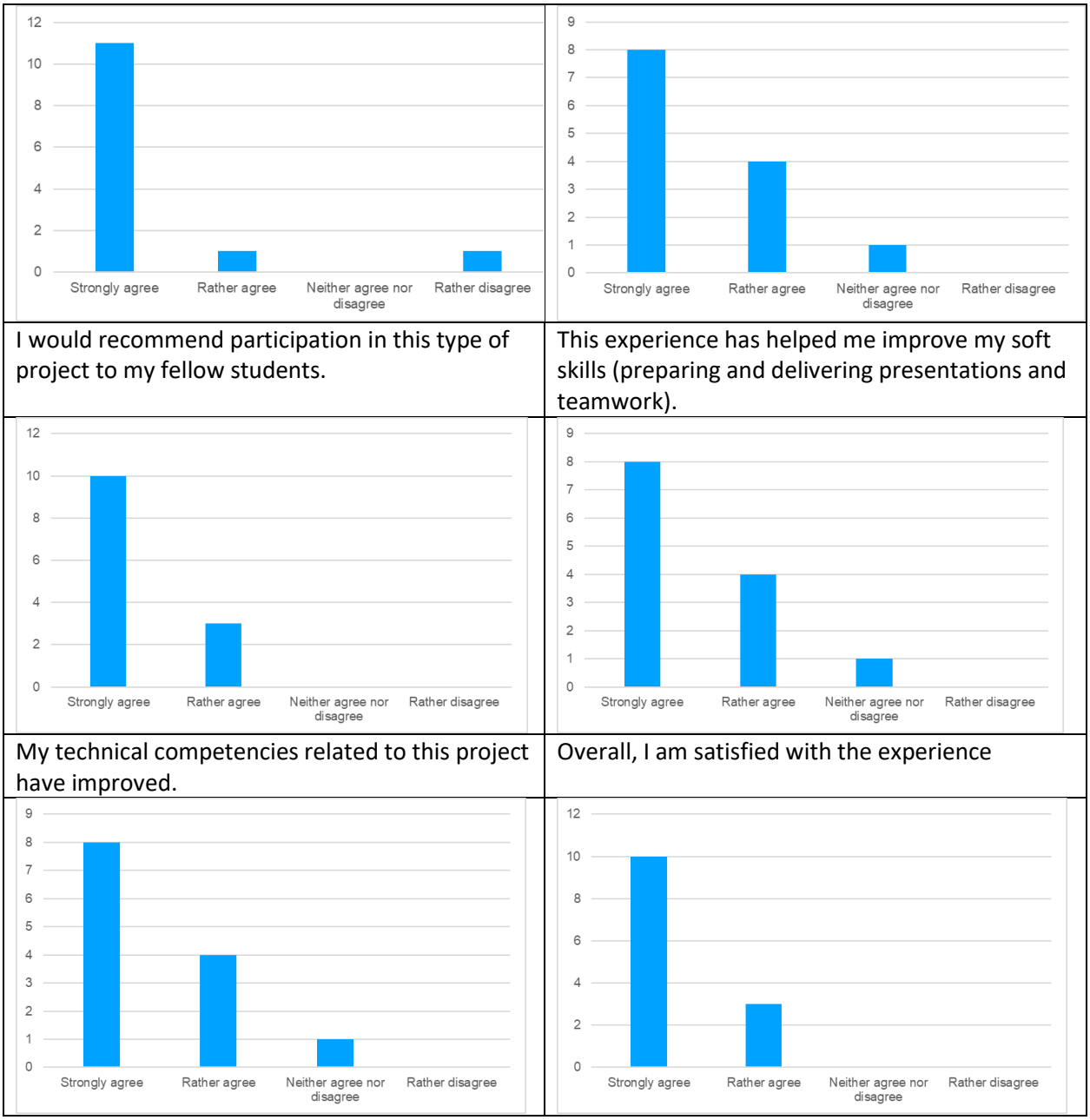


Fig. 9. Student's survey

The students also gave the following ideas for improvement:

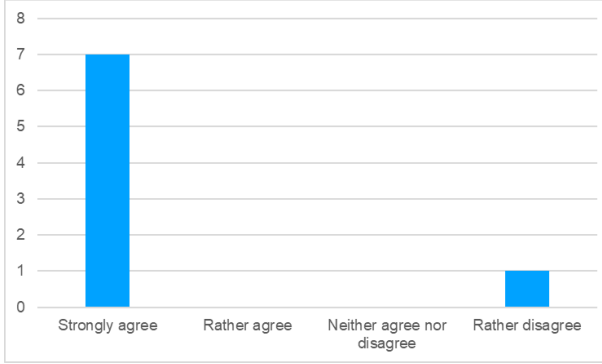
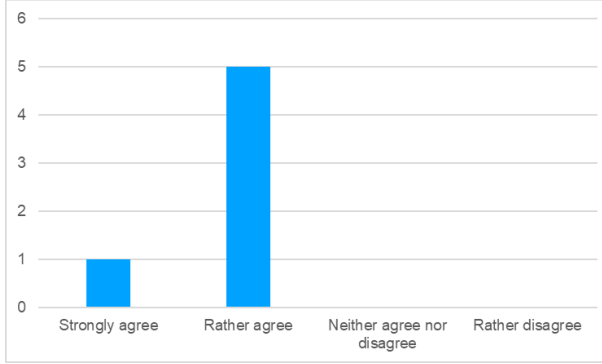
- Maybe would be good to have more detailed information about the final goal at the beginning of the project.
- Everyone took a different path in the project. I think it was a good idea to put us together being from different careers
- The intensive week could be a little longer (+1-2 days) so the students have some free time.

And the top-points of what was really good:

- The project subject was really cool (designing a combustion chamber of a jet engine), social events in Jaen, Jaen culture, meeting diverse people.
- Formation, diversity, understanding.
- It was easy to contact the supervisors for more information, our team was super, everyone was engaged in the project.
- International networking, project topic: real-life problem in a company, work on a topic you are generally unfamiliar with to work on other skills.
- The support received from professors, the whole topic was really interesting, the visits at the company.
- The project, the cooperation and the supervisors.
- Teamworking and final work done is really good.

Most of the students agreed on the support of supervisors and RG representative, the meeting times and were generally satisfied with the experience. The following were commented on as suggestions for improvement: more help at the beginning of the project and longer intensive week.

HEI supervisors and company experts' opinions

<table>
<tr><td>The timetable of distance project working was efficient</td><td>The final result of team A was good</td></tr>
<tr><td> 
</td><td> 
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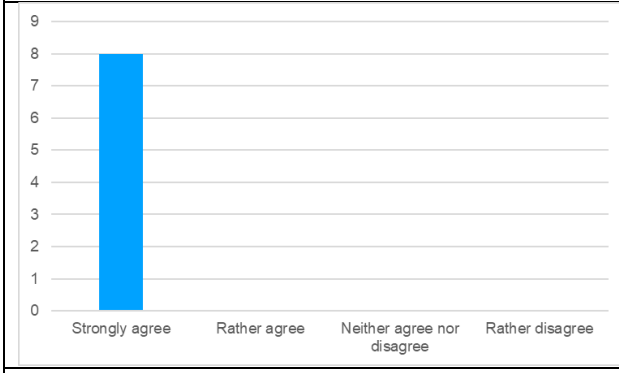
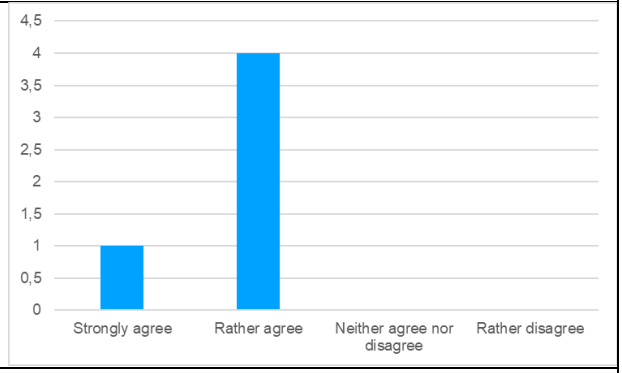
<tr><td>The final result of team B was good</td><td>The final result of team C was good</td></tr>
<tr><td> 
</td><td> 
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<tr><td>Students have improved their soft skills (work in teams, prepare and give presentation)</td><td>Students have improved their technical competences on the project topic</td></tr>
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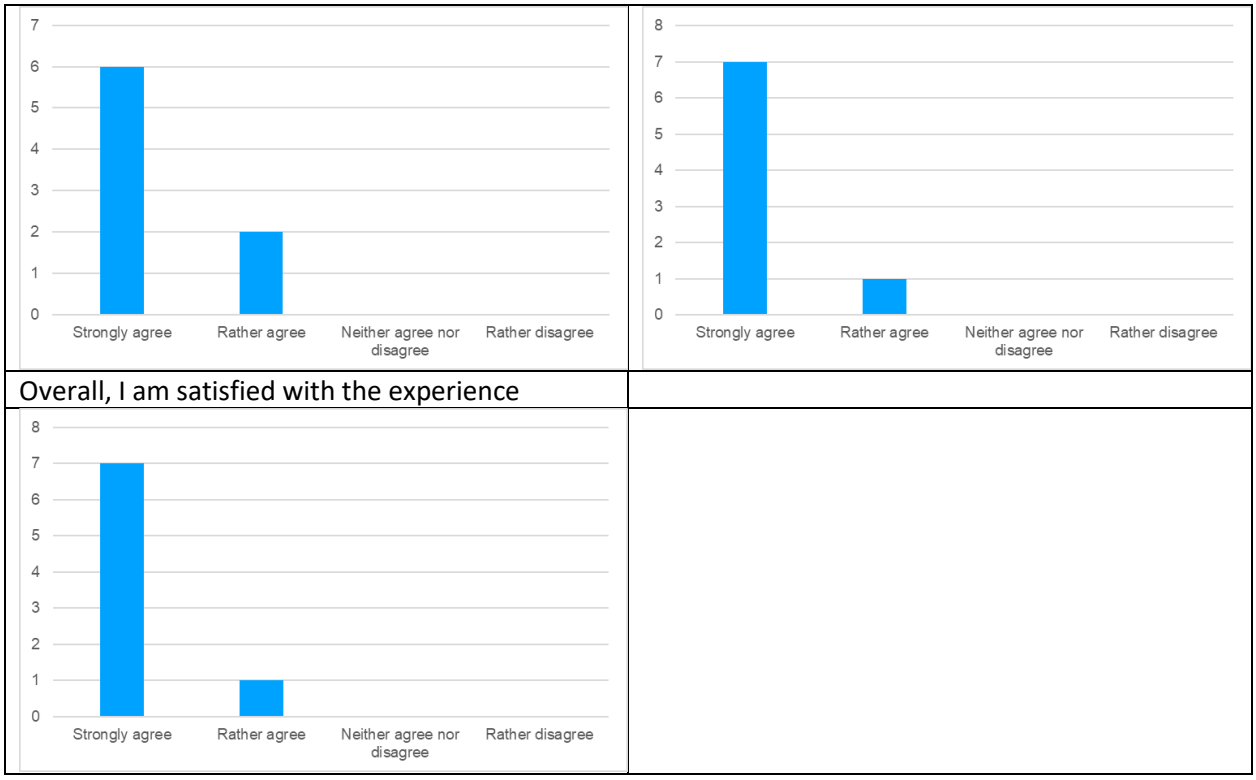

Fig. 10. Supervisors & company members survey

Ideas of improvement t, conflicts, challenges etc. referring to the distance working and the final report:

- I think when people adapt to distance e-meeting is a very useful tool to develop international collaborations, and international teams, for both supervisors and students. Congratulation about it.
- More detailed information on the project topic already before intensive week for the supervisors would have been useful.

Top-3-points of what was really good:

- Simulations, work in an international team, students' motivation.
- First: Students interest and participation. Second: international framework Third: international e-meetings.
- Interesting and challenging topic, Interdisciplinary & international work.

The improvement action proposed was: more detailed information on the project topic already before intensive week for the supervisors. The positive points were mainly related to students motivation, interesting and challenging topic and working in an international team.

6. Conclusion

Activities in the distance work and final virtual seminar were implemented as they were planned. Qualitative and quantitative indicators associated with this activity are presented in the Table 1.

Table 1. Indicators and results associated with the activity A4.13.

Indicator code	Qualitative/Quantitative indicators	Result
Q1	- 50% of participant students gave positive feedback on CEL project activities, teachers involvement and company/research group experts interaction	**- achieved 100%** *Details:* - 100 % of the students were strong or rather agree about the HEI-supervisors support. - 92.3% were strong or rather agree about the company/research group experts support.
Q2	- 90% of the involved students pass the final CEL project assessment	**- achieved 100%** *Details:* - 100% of the involved students pass the final CEL project assessment
Q3	- 70 % of the students have improved their soft skills (work in teams, prepare and give presentations etc.)	**- achieved 100%** *Details:* - 80% of the **supervisors** were strong agree that students have improved their soft skills (work in teams, prepare and give presentations etc.)
Q4	- 70 % of the students have improved their technical competences on the project topic	**- achieved 100%** *Details:* - 87.5% of the **supervisors** were strong agree that students have improved their technical competences on the project topic
Q5	- all (100%) participating students have work in international teams	**- achieved 100%** *Details:* - 100% worked international teams
Q6	- 1 report on CEL6-UJA RG project implementation	**- achieved 100%** *Details:* - **1 report**: R4.13.c Report of CEL6-UJA RG implementation
Q7	- 1 virtual seminar (3 in total for each CEL in round 2)	**- achieved 100%** *Details:* **- 1 virtual seminar for CEL6 held on April 2025**