

## Task O3/A3

# REPORT ON EDUCATIONAL QUALITY ASSESSMENT OF THE PILOT COURSE



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## 1. INTRODUCTION

This report is included in the task “O3-A3 Report on educational quality assessment of the pilot course”, corresponding to Intellectual Output 3 “OER for training and raising awareness” of the SafeCROBOT project.

The partners CTM, UWE have been responsible for to test the software products among students/workers following courses related to the topic of the project. In order to obtain a reliable result, the test was carried out as indicated in the initial proposal among a group of more than 10 people.

In these courses, participants in attendance were able to use the virtual reality glasses and try out the 3D scenarios.

An evaluation questionnaire was elaborated by the partners and filled in by the test participants and a report has subsequently been produced.

This report and all the information about the project are available in the following url:  
<https://safecrobot.pwr.edu.pl/en/>

## 2. PILOT COURSES

Two pilot courses of the SafeCRobot project were held one in Düsseldorf (Germany) and other one in Bristol (UWE).

In total, 47 participants attended, who had the opportunity to learn a little more about process automation in the construction sector and its associated risks and were able to interact with the virtual reality scenarios to test their acquired knowledge and continue learning in a fun way.

### 1.1. PILOT COURSE IN DÜSSELDORF

One of the courses took place in Düsseldorf on 12 October 2022 at the premises of Bildungszentren des Baugewerbes e.V. (BZB). This course was attended by 17 people whose studies/work were related to the project topic, as well as teachers from BZB.

#### 1.1.1. Welcome

Thomas Murauer, Director of BZB welcomed the participants to the course.

#### 1.1.2. Presentation on SafeCRobot

The course began with a presentation by David Caparrós (CTM) on SafeCRobot project and, robots and automates in the construction sector that would allow attendees to have the necessary knowledge to understand the project and its objectives and later interact with 3D scenarios.



Figure 1. Pilot Course in Düsseldorf (I)

### 1.1.3. Presentation and test of 3D scenarios

After this, Carlos Martínez (CTM) showed some of the 3D scenarios developed in the SafeCROBOT project. Using one scenario, he showed the attendees how to use and control the virtual reality glasses so that they could then use them in the other scenarios.



Figure 2. Pilot Course in Düsseldorf (II)



Several attendees made use of the virtual reality goggles and were able to recreate situations they would face in the future.



## 1.2. PILOT COURSE IN BRISTOL

The course in Bristol was held in Bristol on 24 November 2022, at the premises of the University of the West of England, Frenchay Campus. This course was attended by 30 participants from UWE Bristol network. The course information pack is attached below in Figure xxx.

### 1.2.1. Welcome participants

Mr Abhinesh Prabhakaran led the course in Bristol. He started by introducing the project and then the learning objectives of the course. He then proceeded to deliver the course as outlined below.



Figure 3. Pilot Course in Bristol (I).

### 1.2.2. General presentation of the project

After the introduction the course then proceeded with a lecture which addressed the learning objectives by tackling 3 topics: Introduction to Safecrobot Project; Introduction to Robotics and Autonomous Systems, Adoption Barriers; Safety (Health and Environmental) Risks; Safety Standards and Regulations; Exercises (VR Demonstration); Discussion. The learning outcomes were as follows:

By the end of this course:

- Identify some common robotic and autonomous equipment being used on construction sites
- Appreciate key health and safety risks associated with using robotic and autonomous equipment in construction
- Understand some key concepts around safeguarding and preventing accidents on construction sites where autonomous systems are being used
- Understand factors affecting safe interaction between human workers and robotics or autonomous systems in construction.
- Review some common standards and regulations governing health and safety of robotics and autonomous equipment in industrial environments with focus on construction industry.



Figure 4. Pilot Course in Bristol (II).

### 1.2.3. Presentation on Robotics and Autonomous Systems Safety

The lecture which took overall 2 hours covered the above topics through power point slides as presented below.



Figure 5. Course Presentation Slide Cover Page.

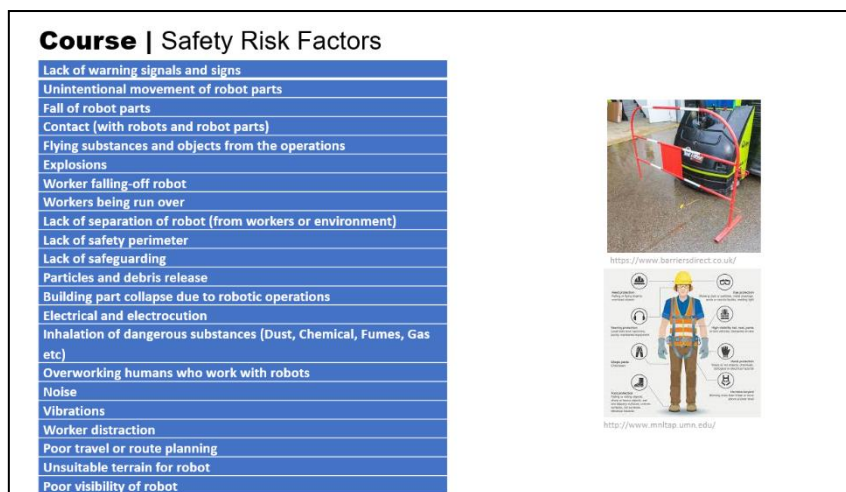


Figure 6. Course Presentation Slide Example 2.



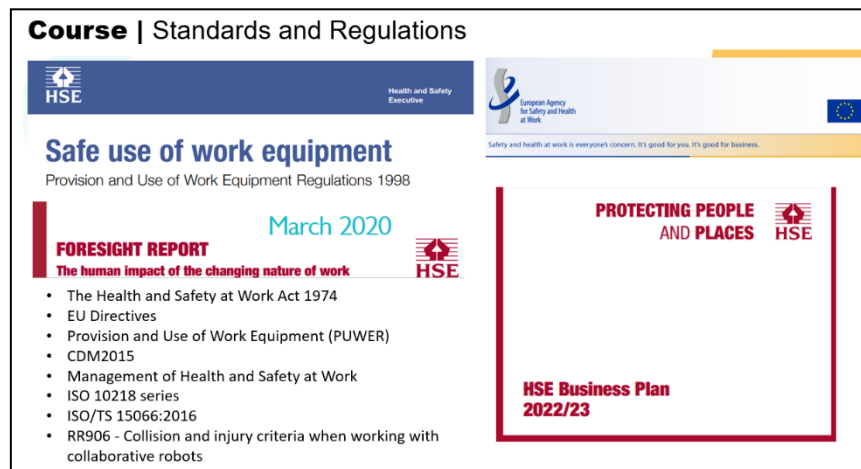


Figure 7. Course Presentation Slide Example 3.

#### 1.2.4. Practice tests with virtual reality (VR)

After the lecture delivery session, participants had the opportunity to test the Safecrobot VR tool in exercise designed to consolidate their learning. This was preceded by a safety instruction on how the use the VR devices followed by instruction on how to play the game. The VR required participants to evaluate 1 of 10 construction scenarios where a various robotics and autonomous construction equipment are being used. They were required to observe safety issues and complete a quiz which took roughly 5 minutes for each participant.



Figure 8. Pilot course Virtual Reality Exercises Bristol.



Figure 9. Pilot course Virtual Reality Exercises Bristol.

### 3. QUALITY ASSESSMENT

Once the pilot courses were completed, the consortium sent an evaluation questionnaire to the participants (students). This is the link to the questionnaire sent to the course participants:  
[https://docs.google.com/forms/d/e/1FAIpQLSfkphcdG-HpQfYtkdjINv\\_G7DLFLJCoPUQd4hYY2lnO7rXteA/viewform](https://docs.google.com/forms/d/e/1FAIpQLSfkphcdG-HpQfYtkdjINv_G7DLFLJCoPUQd4hYY2lnO7rXteA/viewform)

#### 3.1. EVALUATION QUESTIONNAIRE

Screenshots of the questionnaire in question are shown below:



The screenshot shows the header of a Google Form titled "Feedback questionnaire of SafeCRobot Pilot Course." The header includes the SafeCROBOT logo on the left and the Erasmus+ logo on the right. Below the title, the text "VIRTUAL REALITY IMMERSIVE SAFETY TRAINING ENVIRONMENT FOR ROBOTISED AND AUTOMATED CONSTRUCTION SITES" is displayed, followed by the reference number "REFERENCE: 2020-1-UK01-KA202-079176".

Questionnaire supplied by: \*

- ☐ UNIVERSITY OF THE WEST OF ENGLAND, BRISTOL
- ☐ ASOCIACION EMPRESARIAL DE INVESTIGACION CENTRO TECNOLOGICO DEL MARMOL Y LA PIEDRA
- ☐ POLITECHNIKA WROCLAWSKA
- ☐ BILDUNGSZENTREN DES BAUGEWERBES EV

1. Overall, how satisfied were you with the training activity? \*

	1	2	3	4	5	
Not satisfied at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very satisfied

1. Overall, how satisfied were you with the training activity? \*

	Fully disagree	Rather disagree	Neither agree nor disagree	Rather agree	Fully agree
Training activity's contents were of my interest.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel now better informed on various aspects related to safety and robotics.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I now better understand the benefits of the SafeCRobot approach.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I have broaden my knowledge, competences and skills regarding the use of robots in construction and related safety aspects.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



3. To what extent did the training activity show the following attributes? \*

	Fully disagree	Rather disagree	Neither agree nor disagree	Rather agree	Fully agree
Contents were clearly understandable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contents were interesting and motivating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training activity was well-organized and well-structured	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall atmosphere was pleasant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Do you have any further comments and recommendations on the training activity? What could have been done better? \*

	Fully disagree	Rather disagree	Neither agree nor disagree	Rather agree	Fully agree
The organisation and coordination of the training activity functioned:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information you received before the training activity, intended to facilitate your participation was:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The organization of the facilities used for the training activity were:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How was the available technical equipment during the training activity?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The agenda of the training activity was:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The material distributed during the training activity was:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How the training activity was delivered to you:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At the start of the training activity, the themes, the time available and the procedures were:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The time management of the training activity was:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The working conditions for the training activity were:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The working atmosphere of the training activity was:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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The general management of the training activity was:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The management of the development of the work in the training activity was:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The level of participation of the different components of the partners' group was:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did your questions receive satisfactory answers?:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The amount of time available for the training activity was:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The level of correspondence of the results of the training activity with the established objectives was:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. About training team: \*

	Fully disagree	Rather disagree	Neither disagree nor agree	Rather agree	Fully agree
Has extensive knowledge of the course content.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transmission capacity and clarity of exposure are ideal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Motivates and arouses interest in the subject matter.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encourages and facilitates the intervention of the attendees.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is able to respond appropriately to the questions posed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



6. Please, if you have any suggestion, tell us what kind of improvement we could implement:

Tu respuesta

In compliance with the provisions of the LOPD (Organic Law on the Protection of \* Personal Data), NanoSafe consortium informs you that your personal data reflected in our commercial documentation will be incorporated into an automated file with the purpose of being used for the development of the commercial activity itself and to inform you of those products, services and events offered by the entity and that could be of interest to you. You can select "no" in the previous question or, subsequently, exercise your rights of access, rectification, cancellation and opposition by sending a request to the following e-mail address: [info@ctmarmol.es](mailto:info@ctmarmol.es)

☐ Yes

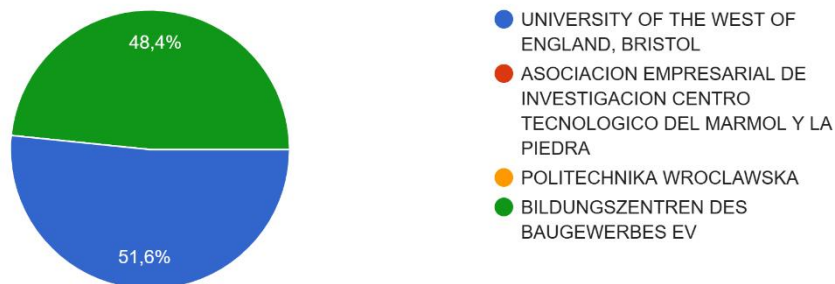
☐ No

### 3.2. RESULTS OF THE QUESTIONNAIRE

These were the results obtained:

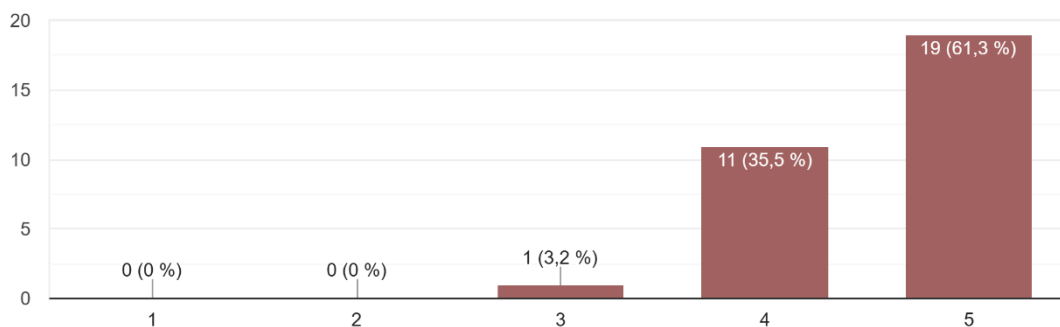
Questionnaire supplied by:

31 respuestas



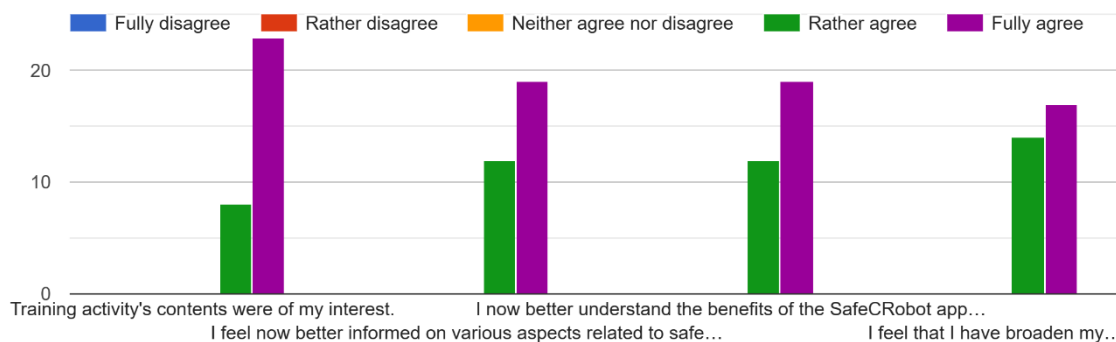
1. Overall, how satisfied were you with the training activity?

31 respuestas

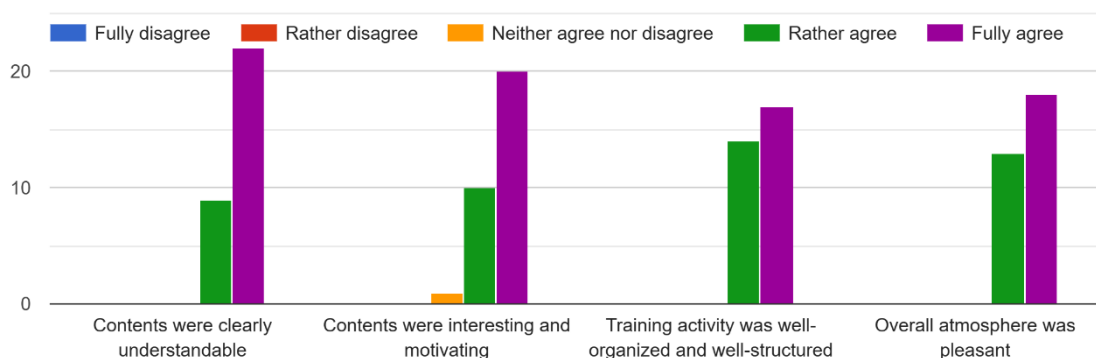


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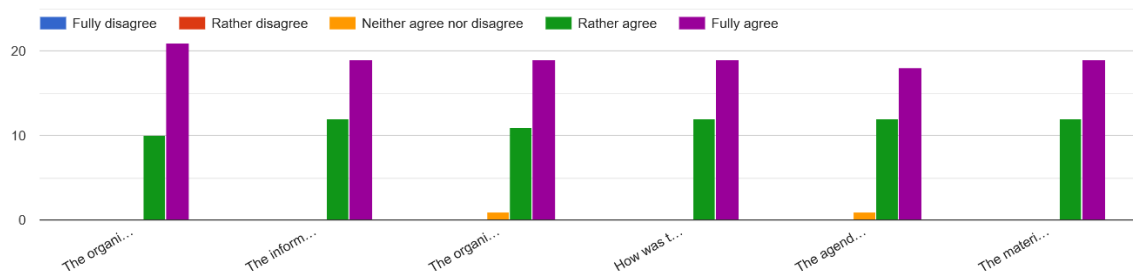
1. Overall, how satisfied were you with the training activity?



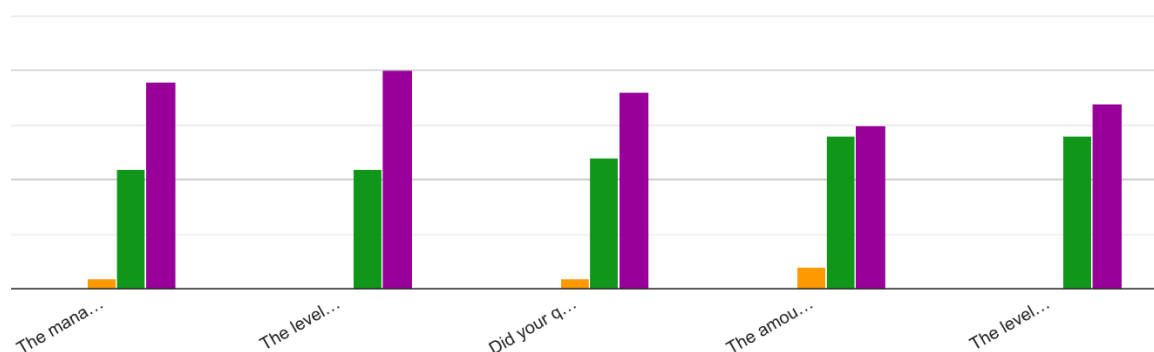
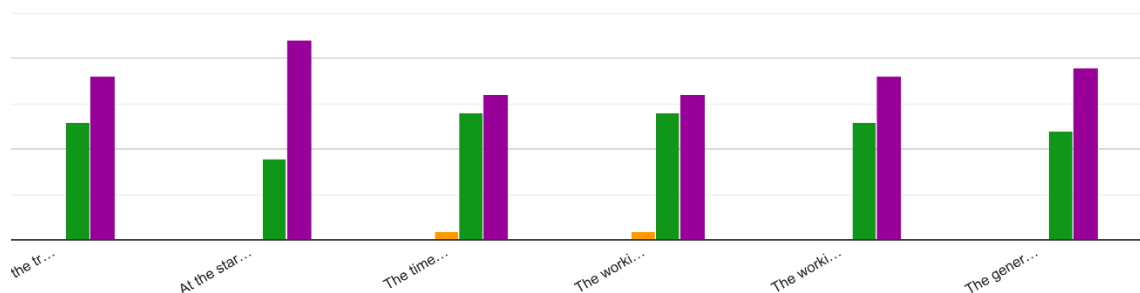
3. To what extent did the training activity show the following attributes?



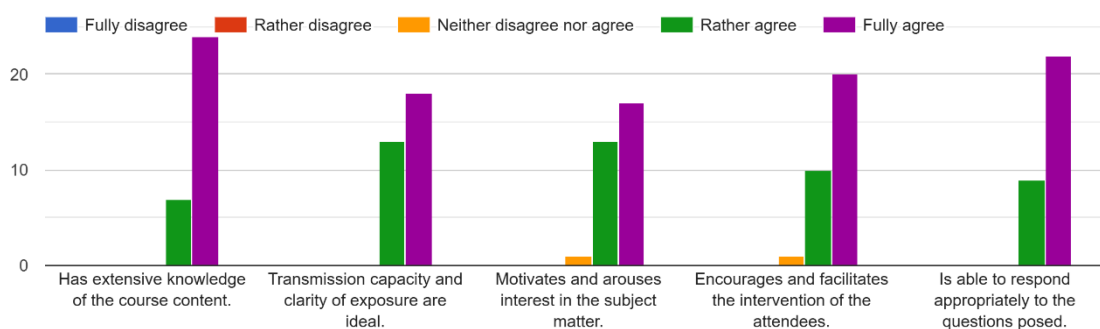
4. Do you have any further comments and recommendations on the training activity? What could have been done better?



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5. About training team:



### 3.3. CONCLUSIONS

Generally, the results obtained from these evaluation questionnaires have been very good. In terms of participation, of the 17 participants in the Germany course, 15 of them filled in the survey, i.e., a participation rate of 88.24%.

The participation of those attending the Bristol course was lower, with only 16 of the 30 participants responding to the survey, i.e. 53.33% of the participants responded to the survey.

This questionnaire, as can be seen in the results, was completed by 15 people from Germany and 16 people from Bristol, which makes the results applicable to both courses.

The participants in the pilot courses were generally quite satisfied with this activity, except for one respondent who was neither satisfied nor dissatisfied.

As can be interpreted from the results, they have improved their knowledge and understood the purpose of the SafeCROBOT project.

Except for one dissenting response, the users found the course interesting and motivating. In addition, they all affirm that the course is well structured, with clear contents and a good working atmosphere.

As a noteworthy aspect, we find in question 4 some scores that are neither in agreement nor in disagreement, most of them associated with course time, time management or agenda.

The teaching team was also rated positively, although one user felt a lack of motivation and did not see the intervention facilitated by the students.

Finally, the suggestions made by the students are related to the results analysed above, suggesting a longer duration of the course.