

D6.5 Training evaluation framework, material and results

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| Related Work Package | WP 6 Training activities and awareness creation on future traffic scenarios |
| Version/Status | Final |
| Issue date | 26/05/2023 |
| Deliverable type | R |
| Dissemination Level | PU |
| Project Acronym | SAFE-UP |
| Project Title | proactive SAFETy systems and tools for a constantly UPgrading road environment |
| Project Website | www.SAFE-UP.eu |
| Project Coordinator | Núria Parera Applus IDIADA |
| Grant Agreement No. | 861570 |



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Document Distribution

| Version | Date | Distributed to |
|---------|------------|-----------------------------|
| 1 | 30/03/2023 | WP partners |
| 2 | 12/05/2023 | Peer reviewers |
| 3 | 26/05/2023 | Coordination Team |
| 3 | 29/05/2023 | Submission in the EC System |
| | | Approved by the EC |



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Executive summary

The purpose of SAFE-UP is to proactively address new traffic safety issues that are anticipated to come along with the increased use of vehicles with automated emergency and driving features. Changes in the interactions between automobiles and unprotected road users (URUs) - also known as vulnerable road users (VRUs) - could lead to the emergence of new risks. Work Package 6's purpose is to support the technological work packages of SAFE-UP by laying out plans for flexible Training, Educational, and Awareness-Raising strategies and programs that will ensure URU awareness as autonomous vehicle (AV) technology develops and the traffic environment changes in the future.

The current report is the outcome of T6.4 “Evaluation of training program and material” of WP 6 “Training activities and awareness creation on future traffic scenarios”. The objective of this task is to create and implement a training evaluation framework to ensure the effectiveness of content, material, and delivery methods as well as the training program’s adaptability and potential for improvement/ enrichment.

In the context of this Task the methodology of the evaluation of the training courses has been conceptualized and respective evaluation material (remote on-line questionnaires) have been developed. Participants were able to access the training material, complete short questionnaires afterwards, and provide feedback.

The evaluation framework has been based upon the initial Key Performance Indicators (KPIs) that were developed in previous WP6 Deliverables, namely D6.1 [1] and have been enriched and included in our Training, Education & Awareness evaluation framework.

Specific evaluation material for all **five** e-Learning courses that have been developed in the framework of T6.2 to enhance the training, education, and awareness of the target audiences regarding the main outcomes of the SAFE-UP project (the SCS and the demos) but also on general road safety issues, were developed and shared with the evaluation participants.

After the end of the evaluation period, 96 evaluations from general public and 33 from experts were completed in total for all the courses. The general public evaluation was conducted through an online survey, while the expert evaluation included participation in two workshops and completion of another online survey, resulting in a total of 66 evaluations from the general public and 30 evaluations from experts.

Apart from the five e-Learning courses, a short video was developed, using the simulator car of CERTH, to demonstrate the critical WP2 traffic scenarios. Selected trainees (N=30 across partners) completed short pre- and post-video watching feedback forms to allow direct, investigation on its usability, effectiveness, and perceived value.

The results were fed back to improve and further adapt the training courses. The final versions are available online on the Knowledge Translation (KT) tab of the SAFE-UP website.



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List of abbreviations

| Abbreviation | Meaning |
|--------------|--|
| AV | Autonomous Vehicles |
| CAVs | Connected and Automated Vehicles |
| CITS | Computer, Information, and Telecommunication Systems |
| D | Deliverable |
| KT | Knowledge Translation |
| KPI | Key Performance Indicator |
| KU | Knowledge User (See D6.1 for definition) |
| NGO | Non-Governmental Organisation |
| OEM | Original Equipment Manufacturer |
| PTW | Powered Two Wheelers |
| ROI | Return on Investment |
| SCS | Safety Critical Scenarios |
| T | Task |
| URU | Unprotected road user |
| VRU | Vulnerable road user |
| WP | Work Package |



1 Introduction

Training evaluation plays a pivotal role in assessing the effectiveness of training programs and ensuring they meet their intended objectives. It serves as a valuable tool for gaining insights into the strengths and weaknesses of the training initiatives and identifying areas that require improvement. Developing a comprehensive training evaluation framework, entails a meticulous planning process that considers numerous factors. These include clearly defining the evaluation objectives, selecting appropriate evaluation methods, determining relevant evaluation criteria, and collecting and analysing data effectively. Additionally, stakeholder engagement and feedback are vital components in designing an evaluation framework that captures diverse perspectives and promotes continuous improvement. By embracing a systematic and well-designed approach to training evaluation, we can enhance the quality and impact of our training programs, ultimately leading to better outcomes and increased success in achieving our goals.

The evaluation of training and educational programs has a longstanding history with much meta-theoretical research on various different approaches (Kellaghan and Stufflebeam 2003). Especially regarding road safety, the evaluation of training programs is crucial to determine their effectiveness and ensure that they achieve their objectives. In the road safety education and training, the focus is on outcomes beyond those related to assessing and grading students and it is more focused on educational processes and their immediate products, attempting to achieve a comprehensive coverage of the components that together constitute the educational system or program-as-a-whole.

In SAFE-UP, the approach to evaluation that is developed focuses on the effectiveness of the educational processes used to bring about intended learning goals (see D6.4 (Chalkia et al. 2022) for details). This is based on the general methodology that was followed to create the training course, which is based on learning objectives, learning goals, and learning outcomes, as they have been conceptualised in D6.2 (Nugent et al. 2021) and described in detail in D6.4 for each course (Chalkia et al. 2022).

The training evaluation framework was based upon Kirkpatrick's methodology (Kirkpatrick, 1994) which is a widely recognized and widely used model for evaluating training programs. It was developed by Donald Kirkpatrick in the 1950s and has been refined and expanded since then. The Kirkpatrick model consists of four levels of evaluation:

- Level 1: Reaction - This level measures how the participants react to the training program. Feedback is collected through surveys, questionnaires, or interviews to determine the participants' satisfaction level with the training program.
- Level 2: Learning - This level measures how much the participants have learned during the training program. The evaluation is done through pre- and post-training assessments or tests to determine the level of knowledge or skills gained.
- Level 3: Behaviour - This level measures the extent to which participants apply what they have learned in the workplace. Observations, interviews, or other methods are used to evaluate the changes in behaviour or performance after the training program.



- Level 4: Results - This level measures the impact of the training program on the organization's goals and objectives. The evaluation is done through data analysis and other relevant methods to determine the ROI (Return on Investment) of the training program.

The Kirkpatrick's methodology provides a comprehensive framework for evaluating the effectiveness of training programs. In SAFE-UP we used Level 1 and Level 2 of Kirkpatrick's methodology, since Level 3 and Level 4 are not applicable to be evaluated at the duration of the project and do not match the scope of the research.

The training courses that have been created and evaluated in SAFE-UP, where the **five** e-Learning courses that have been developed in the framework of T6.2 to enhance the training, education, and awareness of the target audiences regarding the main outcomes of the SAFE-UP project, meaning the Safety Critical Scenarios and the demos, but also regarding general road safety issues. The e-Learning platform of SAFE-UP¹ is on Moodle and the five developed courses are the following:

1. Drivers' and pedestrians' safety on the road
2. SafeRiders'
3. Drivers' and bicyclists' safety on the road
4. Getting to know SAFEUP's Demos
5. Automated vehicles today and in the future

From the very beginning of our research, we understood that the various advocacy groups of the unprotected (a.k.a. vulnerable) road users wanted to avoid victim blaming by supporting training, education, and awareness approaches that include all types of road users. In light of this, our approach involved developing courses that focused on combinations of road users rather than individual user types addressed by SAFE-UP. For instance, in the pedestrian and car drivers' course, our objective was to foster empathy and understanding between these two groups by providing insights into how they perceive the same situations. Our intention is not to assign blame to any specific user in the event of a crash, but rather to equip them with knowledge about potentially hazardous situations that can affect both parties. By doing so, we encourage a shared responsibility for road safety among all road users.

The main objective of this evaluation was to identify deficient points of the eLearning courses and update their content and formatting to fit the needs of the intended audience, based also at the list of Key Performance Indicators (KPIs) that have been used.

¹ https://hit-projects.gr/SafeUp_elearning/login/index.php



1.1 WP6 flow and connection to other work packages

The overarching logic flow for WP6 activities goes as follows:

1. Develop processes (Knowledge Translation for Road Safety Innovation, the Safety Partner Network) carried out in T6.3, to support all WP6 tasks.
2. Adapt frameworks (T6.1) (KT Plan and Constructive Alignment for design of educational programs) and apply them to the SAFE-UP results (T6.2).
3. Create outputs as working examples for training, education and awareness approaches to all road users' safety (T6.2).
4. Test and collect feedback (T6.4) on programs and materials developed, with inputs from external stakeholders (SAFE-UP advisory board, AB, expanding SPN and public).
5. Report on the (estimated) performance, acceptance and usability of training, education and awareness materials and programs, with lessons learned, suggestions for further development, implementation, and measurements of use and uptake. (T6.4).

The organizational structure of SAFE-UP's different technical and non-technical activities is illustrated also at the following Figure 1. From the expected outcomes of SAFE-UP, the following themes provide the safety information content for training, education and awareness objectives.

- WP2 – The **Safety Critical Scenarios** (SCS) defined in WP2 provide knowledge on existing and evolving road traffic risks to URUs in interactions with passenger cars.
- WP3 and WP4 Demo 1 – information on **occupant monitoring and restraining systems** SAFE-UP developments. Knowledge and understanding new seating positions and safe use of adaptive restraint systems for highly automated vehicles, with relevance to highway Safety-Critical scenarios.
- WP3 Demos 2 & 3 – information on the **new safety technologies**, such as enhanced sensors for better URU detection in bad weather and automated emergency avoidance manoeuvres. Knowledge and understanding of intended use cases, proper use and system capabilities and limitations in operating domain and response characteristics which could have safety and responsibility implications for both occupants and unprotected road users outside the vehicle.
- WP3 Demo 4 – gaps in and promotion of increased **road user connectivity** associated with increasing AV penetration and future implementation of CITS systems to support crash avoidance and URU safety.
- WP7 – information and knowledge regarding **pathway towards Connected and Automated Vehicles (CAVs)** including business, technology and policy drivers defining a plausible and coherent long-term future scenario.



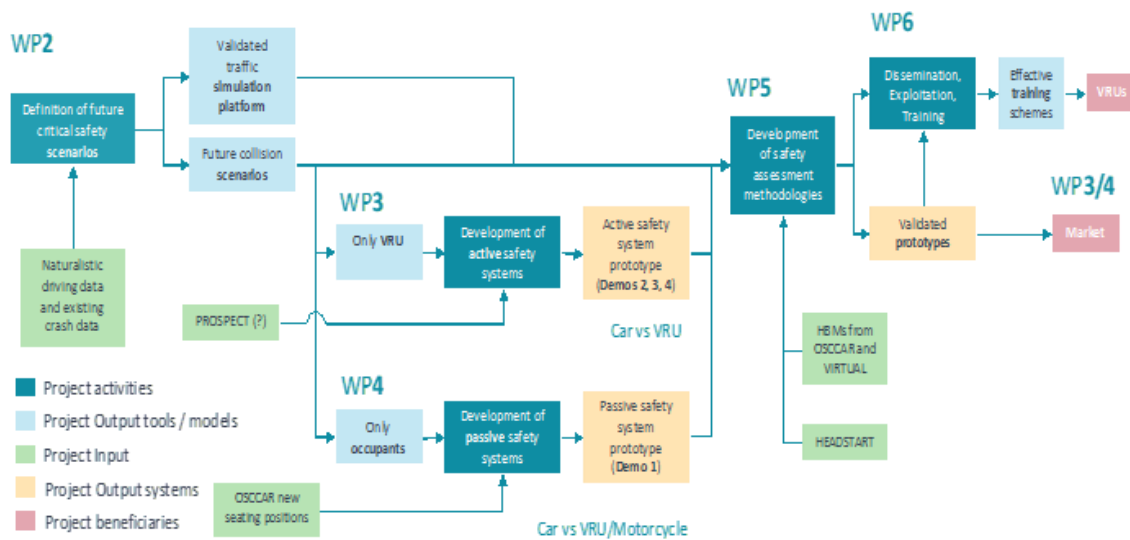


Figure 1 SAFE-UP project approach and interrelations among WPs.

1.2 Organization of Deliverable 6.5

The current report includes five Chapters. The first chapter is the Introduction, which includes background information on the road safety training courses that were evaluated and the objectives of the evaluation. The second chapter is the SAFE-UP training evaluation framework that includes an overview of the evaluation methodology, including data collection methods, tools, and analysis techniques of the evaluation. The third chapter is the evaluation Results that includes detailed findings of the evaluation, including the key performance indicators (KPIs) used, as well as analysis of the evaluation results, including graphical representations of the data. Chapter four is the discussion and recommendations which provides a thorough discussion of the results and their implications for the effectiveness of the road safety training courses, as well as recommendations for improving the road safety training courses in general based on the evaluation results of SAFE-UP, identifying areas for improvement in the road safety training program, as well as limitations and suggestions for future research to enhance road safety training systems. The final chapter is the conclusions.



2 SAFE-UP training evaluation framework and materials

2.1 Introduction

A training evaluation framework provides a systematic approach to evaluating training programs. It provides a clear and structured process for evaluating the effectiveness of training programs and identifies the actual KPIs that will be used to measure the success of the training program. By using a framework, we can ensure that the evaluation process is consistent, objective, and aligned with the goals and objectives.

The purpose of this Section is to present the evaluation framework of SAFE-UP that has been used to evaluate the effectiveness of the training courses developed in T6.3. The Section will provide an overview of the framework and its key components, including the KPIs that can be used to evaluate training programs. The Section will also provide the material that were developed for implementing the framework and addresses common challenges that may be faced during the evaluation process.

SAFE-UP training evaluation framework consists of the following

1. Purpose and Scope of the Evaluation
 - The purpose of the evaluation, such as to assess the effectiveness of a specific road safety training program.
 - The scope of the evaluation, including the target audience and the timeframe of the evaluation.
2. Evaluation Design
 - The evaluation design, including the data collection methods, tools, and analysis techniques that will be used.
 - The key performance indicators (KPIs) that will be used to evaluate the road safety training program, such as changes in knowledge, skills, and behaviours related to road safety.
3. Data Collection
 - The data collection plan, including the sources of data (such as surveys, interviews, and observations) and the timeline for collecting the data.
4. Data Analysis
 - The analysis plan, including the techniques that will be used to analyse the data (such as descriptive statistics, inferential statistics, and content analysis).
 - The plan for reporting the results of the analysis.
5. Reporting and Recommendations



- The report structure, including the content and format of the report.
- The recommendations that will be made based on the evaluation results, such as improvements to the road safety training program or suggestions for future evaluations.

This framework provides a structured and comprehensive approach to evaluate SAFE-UP training program.

2.2 Purpose, Objectives and Scope of the Evaluation

The purpose of SAFE-UP training evaluation is to assess the effectiveness of the training courses in improving road safety knowledge, skills, and behaviours among the target audience. The evaluation will assess the impact of the SAFE-UP training program on the target audience and provide valuable insights into the effectiveness of the program. It will identify areas where the program was successful and areas where improvements could be made to enhance the program's effectiveness. Thus, the evaluation serves several important purposes, such as:

- **Assessing Learning Outcomes:** The evaluation helps determine the extent to which participants have acquired the knowledge, skills, and competencies intended by the training program. It provides insights into the effectiveness of the instructional methods, materials, and activities employed.
- **Identifying Program Strengths and Weaknesses:** By evaluating the training program, strengths and weaknesses can be identified. This information allows trainers and program developers to build upon successful elements while addressing areas that require improvement.
- **Enhancing Program Design:** Evaluation findings guide the refinement and enhancement of future iterations of the training program. The data collected can inform decisions about instructional strategies, content selection, and overall program structure to optimize learning outcomes.
- **Informing Decision Making:** Evaluation results provide valuable information to decision-makers, such as program managers, trainers, or stakeholders, enabling them to make informed decisions about resource allocation, program continuation, or modifications. It helps justify investments in training initiatives.
- **Continuous Improvement:** Evaluation is an iterative process that fosters continuous improvement. It allows for ongoing monitoring and adjustment of the training program to ensure it remains relevant, effective, and aligned with evolving needs and goals.

One main scope of the training evaluation is to define if the training objectives have been tackled successfully. Based on D6.1 (Nugent, 2021) and D6.4 (Chalkia, 2022), SAFE-UP training objectives are:



- To educate & build capacity among researchers to understand stakeholder information needs, working paradigms to more quickly towards problem solving based on identification of shared values and goals.
- To inform, educate and promote general awareness, user confidence.
- To inform, share knowledge, nurture trust, establish credibility and links to concerns and values of target audience.
- To generate awareness and acceptance.
- To make the research available to a broad audience.
- To improve or acquire specific skills (e.g. for safer traffic participation, hazard perception, using the evidence to inform driver's license training and testing policy, using the evidence to inform city planning, infrastructure planning and community activism)
- To improve or acquire hazard perception skills, behaviour change, road strategies and metacognitive skills for self-monitoring.
- To promote safe behaviour and practice change.

Regarding the target audience of the evaluation, this includes all the Knowledge users which are the experts related to road and road safety, as well as all road users (drivers, pedestrians, PTW riders, bicyclists).

The evaluation process was initiated immediately after the initial version of the training courses was released. To ensure comprehensive feedback, we shared the course links with specific stakeholders, both within and outside the Consortium. This approach was taken to prevent public dissemination of the courses before their evaluation by the intended audience. The evaluation phase spanned approximately one and a half months, allowing sufficient time for stakeholders to engage with the courses and provide their valuable feedback.

2.3 Evaluation Design

The evaluation design of the SAFE-UP training program has been carefully planned and implemented to ensure that the evaluation is effective and provides valuable insights into the training program's effectiveness. Overall, selecting the appropriate data collection methods and tools was crucial to ensure that the evaluation provides reliable and valid data on the effectiveness of the SAFE-UP training program. The methods and tools selected should align with the evaluation objectives and goals and be appropriate for the target audience.

There are several data collection methods and tools that can be used to evaluate the effectiveness of a road safety training course. Below are the specific collection methods and tools that have been used in SAFE-UP's training courses evaluation:

1. Surveys:



- Surveys are a commonly used data collection method for evaluating training programs. They can be used to collect quantitative data on road safety knowledge, skills, and behaviours, as well as participant satisfaction with the training program.
 - The evaluation survey of SAFE-UP was realized online using questionnaires presented in google forms.
2. Focus Groups (workshops):
 - Focus groups are a qualitative data collection method that can be used to gather participants' perceptions and opinions about the training program.
 - In SAFE-UP two focus groups were conducted in forms of workshops with a small group of participants/ experts that was moderated by a facilitator.
 3. Checklists and Rating Scales:
 - Checklists and rating scales can be used to collect quantitative data on participants' road safety knowledge, skills, and behaviours.
 - Checklists and rating scales have been used in SAFE-UP after the training program and were self-administered.
 4. Pre- and Post-Tests:
 - Pre- and post-tests can be used to collect direct quantitative data on the usability, effectiveness, and perceived value of the training program.
 - Pre-tests were administered before an awareness video, and post-tests were administered after watching the awareness video.
 5. Proof reading and content detailed checking:
 - Proof reading and detailed content checking is really important to be done from the people who are the developers of the technology to make sure that the KT has been realised in the most successful and correct manner.
 - The proof reading and detailed content checking has mainly been done by the technical partners of the consortium that created the demos providing lists of fixes that have all been taken into account.

Another important aspect at the evaluation design is the key performance indicators (KPIs). At the time of writing of the project proposal, an initial list of general KPIs (below) for training and educational programs was outlined, and it has been refined according to findings on specific users' needs and interests, and defined target training, education and awareness activities.

Initial list of general KPIs

1. Training program effectiveness.
2. Potential impact on targeted users.
3. Training content relevance and accessibility to ensure user uptake.
4. Framework for training program development is flexible & updatable



- Allows updating of courses, dissemination topics and educational information.
 - Is in pace with increasing automation and advancements in road safety technology.
5. Media, formats and messages are inclusive, addresses diversity.
- Adaptable to specific user types, demographic groups.
 - Relevant to cultural, regional & infrastructure contexts.

Detailed KPIs for Training Education & Awareness programs considering aspects such as content, format, accessibility, acceptability, and feasibility, have been discussed and have been initially provided in D6.1 (Nugent et al., 2021) and specifically they are presented in Table 4.7 of that report. These have been defined by integrating identified training, education and awareness objectives with information collected on targets users' needs, and adapting evaluation guidelines and metrics from the Knowledge Translation Planning Template and the Constructive Alignment framework as presented in D6.1. The detailed list of the KPIs follows.

- **Content Relevance:** The training materials have to align with the learning objectives and desired outcomes and the content has to cover the necessary topics, concepts, and skills adequately.
- **Accuracy and Validity:** The information presented in the training courses has to be accurate and valid. The content has to be up-to-date, factually correct, and supported by reliable sources or references.
- **Clarity and Organization:** The training materials have to be structured and organized and the information has to be presented in a clear, logical, and coherent manner, making it easy for learners to follow and understand.
- **Engagement and Interactivity:** There has to be a high level of engagement and interactivity offered by the training materials.
- **Adaptability and Accessibility:** The training materials have to be adapted to different learning styles, levels, and contexts. They also have to be accessible to different audiences.
- **Learning Outcomes:** The impact of the training materials on the intended learning outcomes has to be extracted in a way that learners can express improved knowledge, skills, or behaviour as a result of engaging with the materials.
- **User Feedback and Reviews:** Feedback from learners or instructors who have used the training materials has to be gathered and reviews and testimonials can provide insights into the effectiveness and usefulness of the materials.



2.4 Data Collection

The data collection was realized using multiple channels. Firstly specifically, tailor made on SAFE-UP purposes, questionnaires were developed for general audience surveys. Questionnaires are a popular and effective data collection method for evaluating training courses. They can be designed to collect quantitative and or qualitative data on participants' road safety knowledge, attitudes, and behaviours.

In SAFE-UP, specific, brief and clearly defined questionnaires have been used that include a mix of closed-ended and open-ended questions. Closed-ended questions can be used to collect quantitative data, while open-ended questions can be used to collect qualitative data. A mix of closed-ended and open-ended questions can provide a more comprehensive evaluation. The questions should be written in clear and concise language to ensure that participants can easily understand and answer them.

The evaluation questionnaires' design was guiding the evaluation objectives and the questions were aligned with the objectives and goals of the training. Additionally, the questionnaire included a part that asked for demographic and general questions regarding driving/riding, and it was followed by a part of specific questions related to the SAFE-UP training objectives.

The SAFE-UP evaluation questionnaires were created using google forms and were online and easy to reach by all participants. The questionnaire for general public that was used to evaluate the training courses is presented in Annex A.

Additionally, specific questionnaire for experts have also been developed. The questionnaires for the experts were also used as a tool for the Workshops with experts that have been realized (see results in Section 3.3). The questionnaire for experts that was used to evaluate the training courses is presented in Annex B.

Finally, a short before and after questionnaire was developed to rate a short video related to pedestrian and drivers safety awareness. The questionnaire is presented in Annex C.

2.5 Data Analysis

The plan for the data analysis of SAFE-UP evaluation is including the techniques that will be used to analyse the data (such as descriptive statistics, inferential statistics, and content analysis). The questionnaires developed intentionally include many open-ended questions. Open-ended questions are a type of qualitative data collection method that allow participants to respond in their own words and provide rich, detailed insights into their experiences, opinions, and perspectives.

In order to analyse the results of the open-ended questions we went through the following steps:

1. Organize the responses:

First, we organized the responses by grouping together similar or related responses. This can help identify common themes or patterns in the data.



2. Identify key themes:

Once the responses have been coded, we identified the key themes or patterns that emerge from the data. This can be done by reviewing the codes and grouping together related codes.

3. Interpret the results:

Finally, we interpreted the results by summarizing the key themes and patterns and drawing conclusions based on the data. This can include identifying areas where the training program was successful or areas where it could be improved.

It is important to note that open-ended questions provide qualitative data that is more subjective and can be more difficult to analyse than quantitative data. However, they can also provide more detailed and nuanced insights into participants' experiences and opinions, which can be valuable for improving training programs and understanding the needs of participants.

The closed-ended questions we used were on a Likert scale, and their analysis involves several key steps. Firstly, it is essential to understand the Likert scale's structure, which consists of a series of statements or items with response options ranging from, for instance, "strongly disagree" to "strongly agree." To analyse the data collected, we will calculate descriptive statistics, such as mean, median, and mode, to summarize the respondents' overall responses. Overall, analysing closed-ended questions on a Likert scale requires a combination of statistical calculations and thoughtful interpretation to derive meaningful insights from the responses.

2.6 Reporting and Recommendations

Reporting and recommendations are important components of our training evaluation process. The recommendations of SAFE-UP training evaluation summarize the key findings and highlight any areas of strength or weakness in the training program. Additionally, based on the evaluation findings, areas where the training program can be improved have been identified.

Finally, the results of the training have been used to create a set of guidelines for experts, policy makers, cities, authorities, and other trainers that will be made available on the D6.3.

Reporting and recommendations are essential for ensuring that SAFE-UP training program is effective and meet the needs of participants.

2.7 Limitations and constraints

The evaluation of training programs can indeed face several challenges. In SAFE-UP the challenges we mainly face, and we can foresee are related to translation/language, length, limited number of participants, participants mainly from the consortium, and the absence of a budget. Let's explore each of these challenges in more detail:

- Translation/Language: The SAFE-UP eLearning courses were initially made in English. They were not translated before the evaluation, because the intention was



to translate the final outcomes, after the evaluation. So, there might be language barriers may affect participants' understanding and engagement with the course content.

- Length of evaluation period: The length of the evaluation period will be limited, since there are time constraints or deadlines to meet. Conducting an evaluation within a short timeframe may result in a reduced sample size or limited scope of data collection.
- Length of the course: The extended length of the course can lead to participant fatigue and reduced engagement. The extended length of the courses was managed by designing engaging and interactive content that maintains participant interest throughout.
- Limited Number of Participants: When the evaluation relies on a small number of participants, the results may not be representative of the larger target audience. It becomes challenging to generalize findings or make conclusive statements about the effectiveness of the training course. Engaging external stakeholders and target audience members can provide valuable insights and ensure a more comprehensive evaluation.
- Participants Mainly from the Consortium: If the evaluation primarily involves participants from the consortium or those closely associated with the project, it can introduce bias and lack diverse perspectives. This limitation may impact the external validity of the evaluation findings and hinder the identification of potential areas for improvement.
- Limited Budget: Conducting an evaluation without a dedicated budget can pose challenges in terms of resource allocation, data collection, and analysis. Limited financial resources may restrict the scope and depth of the evaluation, potentially compromising the quality of the assessment.

To address these challenges, it is crucial to acknowledge the limitations and work within the available resources. Exploring alternative approaches, such as leveraging online platforms for translation, maximizing participant recruitment efforts, seeking external input, and adapting evaluation methodologies to fit the budget constraints, can help overcome some of these challenges. Documenting and discussing these limitations in the evaluation report provides transparency and context for interpreting the results.



3 SAFE-UP training evaluation results

3.1 Introduction

For the evaluation of SAFE-UP courses the eLearning links were given to the Consortium partners which were asked to perform the evaluation. Since the training courses of SAFE-UP do not require any expertise, the audience were drivers, pedestrians, bicyclists, or PTW riders.

In addition to the general users' evaluation (drivers, pedestrians, PTW riders, bicyclists), also experts were asked to evaluate the courses and two workshops were realized in order to get more detailed feedback.

3.2 Evaluation with general public

3.2.1 Drivers and pedestrians course

The course was evaluated by 17 users, 60% identify themselves as males and 40% as females (Figure 2).

Gender Identity

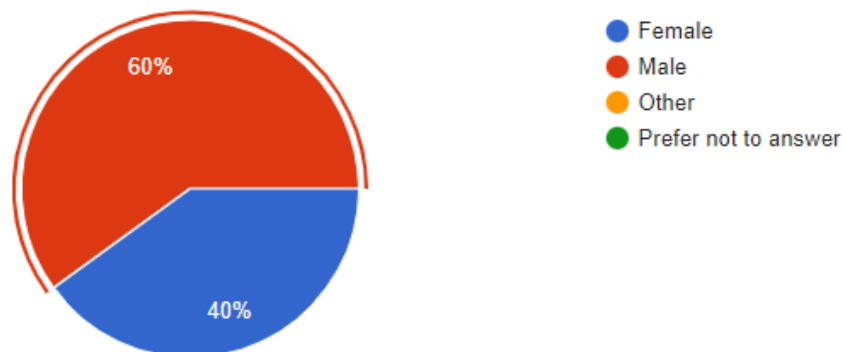


Figure 2: Responders gender identity

Regarding the age, eleven responders were among 25 and 35 years old, two were below 25 and other four were more than 35 years old. All respondents have a B car licence.

The respondents found their experience in general very pleasant since the words they used to describe it were mainly positive with some additional negative ones that will be constructively taken into account for the update of the courses. The words are presented at the following table.



Table 1: Words used to describe the course.

| Positive | Negative |
|----------------------------|----------------------|
| Analytical | Basic |
| Awareness raising | long |
| Clear | old-school interface |
| Comprehensive | |
| Easy | |
| Easy-going | |
| Educational | |
| Effective | |
| Entertaining | |
| Fun | |
| Future oriented | |
| in-depth | |
| Informative | |
| Interactive | |
| Interesting | |
| Pleasant | |
| Practical | |
| Shocking (in a good sense) | |
| Useful for students | |
| Visually appealing | |
| Well structured | |
| Wide range of information | |

The things that the respondents enjoyed the most during the course were

- The UI
 - The graphics.
 - The visuals and videos showing the different perspectives of pedestrians and drivers.
 - The fact that there were pictures and it was more enjoyable to watch the courses.
 - The use of images helps a lot in understanding each scenario and gamification elements such as the quizzes in the end make learning more pleasant.
 - The quizzes.
 - The tips for safe walking the most because they found them extremely useful.
 - The explanatory way of presenting the information that was made in a reader-friendly way, easy to grasp the information given.
- The length of the course
 - The courses brevity.
 - The length. Each section is easy to digest.



- The information is comprehensive and the courses are short.
- The clarity and the structure
 - The different points covered around traffic safety, in a clear and understandable way.
 - It was well-structure, informative and comprehensive
 - Structured layout, quiz at the end.

Regarding things that the respondents enjoyed the least during the course, three respondents had nothing to add, since they were overall happy with the course. The other seven had minor issues such as one question that has different answers in different counties and it will be eliminated from the final course, that there could be more reference for further reading, that the text could not be copied, and that the information provides sometime basic knowledge.

When the respondents were asked what is the most surprising thing they have learned from the course, the answers were related to the following:

- Pedestrians
 - The benefits of walking.
 - That safety is a shared responsibility.
 - The number of pedestrians killed or injured each year.
 - The risks they face when they are on road.
 - The safe walking tips.
- SAFE-UP project
 - The development of the project.
 - SAFEUP demonstrators.
 - The specific C-ITS system for pedestrians.
 - The statistics - didn't know the provided data on accidents before.
- Driving skills
 - The rear-view mirror night adjustment.
 - The role of personal factors.
 - Extended comfort levels provided for the passengers.
 - That you can avoid severe accidents if you just drive slower.

When the respondents were asked what is the most useful and the less useful thing they have learned from the course, the answers were the following.



Table 2: Most useful and least useful element of the training course.

| Most useful | Least useful |
|--|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> Driving skills <ul style="list-style-type: none"> ○ The effect of bad weather. ○ Average risk of death and serious injury (%) with the increase of speed in a crash with a pedestrian/PTW. ○ How many more meters does the car need to stop on a wet road. | <ul style="list-style-type: none"> <input type="checkbox"/> Driving skills <ul style="list-style-type: none"> ○ What to do if I feel tired while driving. ○ Some tips were already known. ○ The role of environmental factors. ○ That VRUs suffer the most road accidents. |
| <ul style="list-style-type: none"> <input type="checkbox"/> Pedestrians <ul style="list-style-type: none"> ○ The safe walking tips. ○ The road perception both for the pedestrians and the drivers | |
| <ul style="list-style-type: none"> <input type="checkbox"/> SAFE-UP project <ul style="list-style-type: none"> ○ The development of the project. ○ How SAFE-UP can improve safety. ○ Special considerations about future automated vehicles. ○ About automated vehicles. ○ The great amount of gaps in standardisation for V2X communication content still available. | |

After the end of the training, the majority of the respondents did not consider that something was missing. One added that there could be tips for PTW riders, but there is another course dedicated to that and another one that there could be more about SAFE-UP demos, but there is also another course for that.

In the important question of changing attitudes base on the course, seven respondents said no. The others would either turn more on walking and to more active modes. Also many users said that they will be more careful. One user also said that he/ she will use the training content for his/ her lectures.

About new learners, almost all the respondents found all the course elements important and interesting. Some of them identified some specific elements though, such as:

- That you should expect the unexpected and always be careful.
- Drivers who use mobile phones are 4x more likely to crash.
- The importance of adapting driving to weather conditions.
- The idea that good driving is also a state of mind, not just quick reflexes.
- Not use the mobile phone neither when driving nor when walking on the street.
- The interaction with road users in general.



About what the respondents would do differently, the majority of them answered that they would walk more and be generally more cautious as drivers and as pedestrians too. Especially regarding driving many responders said that they would reduce their driving speed and be more mindful.

Regarding the acceptance and usefulness questions, regarding the content **relevance**, all respondents believe that the people can use the information from this course to improve the road safety. 60% agree, 30% strongly agree and 10% agree somewhat with the aforementioned statement (Figure 3).



Figure 3: People can use this information to improve their safety

Regarding the content's **accuracy and validity**, the majority of the respondents disagree with the statement that the information was not a good match for their situation. 60% disagree and 20% disagree somewhat. There is still 20% that either agree somewhat or agree with that (Figure 4).



Figure 4: The information was not a good match for my situation



Regarding the content’s **clarity and organization**, all respondents disagree with the statement that the course was confusing. 10 respondents strongly disagree, 6 disagree and 1 disagrees somewhat with the aforementioned statement (Figure 5).

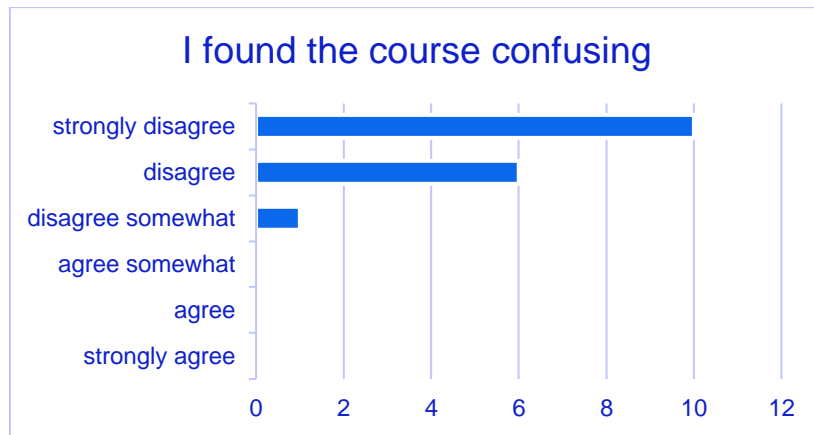


Figure 5: I found the course confusing

Regarding the content’s respondents’ **engagement and Interactivity** with the course, the majority of the respondents agree with the statement that the course was fun and only one respondent somewhat disagrees with this statement. 6 agree, 5 agree somewhat and 5 strongly agree with the aforementioned statement (Figure 6). Additionally, all respondents agree with the statement that the modules were easy to use. 10 agree, 5 strongly agree and 1 agrees somewhat with the aforementioned statement (Figure 7).



Figure 6: The course was fun

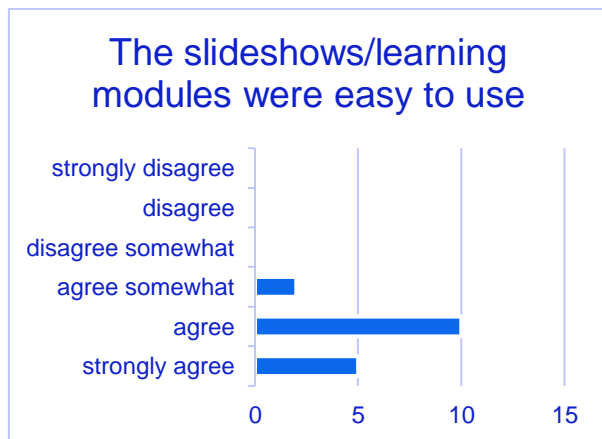


Figure 7: The modules were easy to use

Regarding the content’s **adaptability and accessibility**, the majority of the respondents disagree with the statement that the language of the course was too technical. 7 disagree, 4 disagree somewhat and 4 strongly disagree with the aforementioned statement, while 4 agree somewhat (Figure 8).



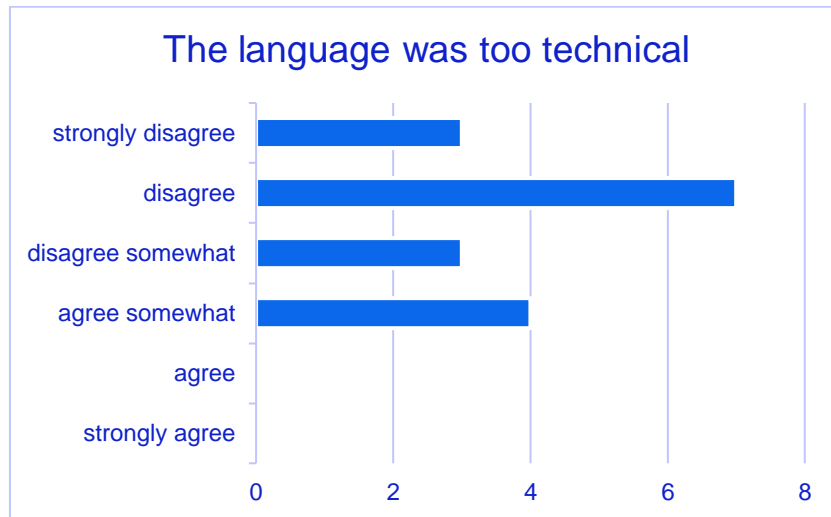


Figure 8: The language was too technical

Regarding the content’s **learning outcomes**, we have already discussed about the impact of the training materials on the intended learning outcomes and the way that learners believe that they can express improved knowledge, skills, or behaviour as a result of engaging with the materials in the previous paragraphs. Additionally, the majority of the respondents would recommend this course to friends and colleagues. 7 strongly agree, 4 agree and 4 agree somewhat with the aforementioned statement, while 2 disagree somewhat (Figure 9).



Figure 9: I would recommend this course to friends and colleagues.

Some specific points to improve from the respondents are the following, accompanied by specific actions to tackle them:

| Suggestions | Actions |
|--|--|
| Add an option to move from section to section at the end of the section. | Not possible from Moodle free account. At another project, were there will be more budget to create further eLearning courses, |



| Suggestions | Actions |
|---|---|
| | a different Moodle subscription may allow this option. |
| Maybe reduce the length of the part on numbers about car crashes and percentage (it felt a bit repetitive) | The repetitive info has been removed. |
| The first question of the first quiz is not a question: "More than half of all road traffic deaths are among these vulnerable road users." | Fixed |
| Some of the questions in the quiz are unclear or do not match the learning of the sections (especially the questions where we had to match an image to a definition - and also it did not work very smoothly) | All questions in the quiz have been reconsidered to match the learning of the sections |
| The videos about the scenario are sometimes a bit too long | All videos have been reduced to match a quick but comprehensive view. |
| I was confused on some of the advice to stay awake not mentioning to take a break. | The part of the driver's vigilance has been reviewed. |
| There were some spelling errors | There was a proof reading and the spelling errors were fixed. |
| There was no sound on any of the video except the last one. Some background music or noise would make it nicer! | The simulation videos indeed do not have any sound. At another project, were there will be more budget to create further simulation videos this has to be taken into account. |

3.2.2 SafeRider's course

This course was evaluated by six users, all male, with age range from 41 to 66 years, all holding motorcycle licenses.

The respondents found their experience in general very pleasant, but providing too much information to be handled in once course. The words are presented at the following table.

Table 3: Words used to describe the course.

| Positive | Negative |
|---------------|----------------------|
| Informative | Academic |
| Comprehensive | Verbose |
| realistic | Too much to remember |
| awesome | |



Table 4 Summary of the responses to the short-answer questions

| Liked most about the course | Liked least about the course |
|---|--|
| <ul style="list-style-type: none"> • Reliance upon research and data to support assertions. • Lots of different resources and approaches. • The interaction. • The videos and the not boring presentation of traffic safety findings. | <ul style="list-style-type: none"> • Flow and small-print information was overwhelming for average learner to commit to and use. • A lot of small text to read. • Some repetition of findings that already are known. |
| Most surprising thing learned | |
| <ul style="list-style-type: none"> • That Safe Road-User Behaviour is ranked so low in the potential for the biggest reduction. • 90% of the hazards are in front of the vehicle. • Looking where you want to go. | |
| Most useful thing learned | Least useful thing learned |
| <ul style="list-style-type: none"> • Hazard perception training and testing for novice riders is among the most effective and safe interventions. • The observation cycle. | <ul style="list-style-type: none"> • Although helpful in analysing crashes, the most common crash types were difficult to relate to and the exercise (1) was not very interactive. |
| Was anything missing? If so, what? | Did the course cause you to change any of your beliefs or opinions? |
| <ul style="list-style-type: none"> • A cogent strategy throughout to emphasize to adopters the value of behavioural change and its effects on decreasing fatalities and injury. • It is quite comprehensive | <ul style="list-style-type: none"> • Very little. Although there is supporting research, the message is very similar to the United States Motorcycle Safety Foundations message but with an overwhelming amount of information that may generally be disregarded by the rider who needs the information the most. • It takes more time to change beliefs or habits than the time I could spend so far on the course. • Nope. Safety first |
| What, if anything, did you find particularly important for new or learner car drivers and/or motorcycle riders? | What will you do differently as a result of your learning? |



| | |
|---|---|
| <ul style="list-style-type: none"> • See-Think-Do is a nice approach or strategy for "real-time" rider analysis. Very Similar to Search-Evaluate-Execute in the United States. • Raise awareness regarding hazards, and mainly the most frequent and dangerous crash scenarios. Also, the typical time it takes to react to unexpected events. • Never stop turning your head. • The observation cycle. | <ul style="list-style-type: none"> • Very little, although I believe the program has great potential, it can probably be made more palatable for the "novice" or future rider. • I started practicing the observation cycle. • Looking turn your head. |
| How will you use what you learned? | |
| <ul style="list-style-type: none"> • I certainly will use the research cited for future learning. • I will continue with my deliberate learning attitude while riding. • Everyday • Due to my profession, most of it is known to me | |

Regarding the acceptance and usefulness questions, regarding the content **relevance**, all respondents believe that the people can use the information from this course to improve the road safety (Figure 10).

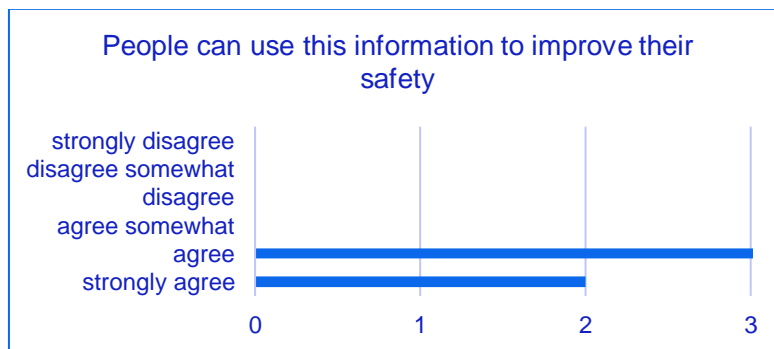


Figure 10: People can use this information to improve their safety

Regarding the content's **accuracy and validity**, all the respondents disagree with the statement that the information was not a good match for their situation, apart from one who agrees somewhat (Figure 11).



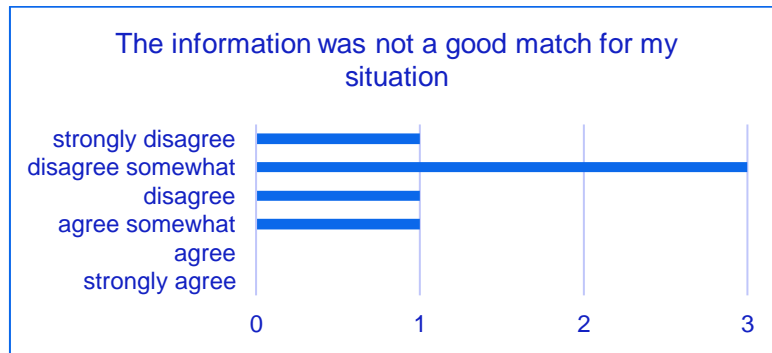


Figure 11: The information was not a good match for my situation

Regarding the content’s **clarity and organization**, 1 respondent agrees, 3 disagrees, 1 disagrees somewhat and 1 strongly disagrees with the aforementioned statement (Figure 12).

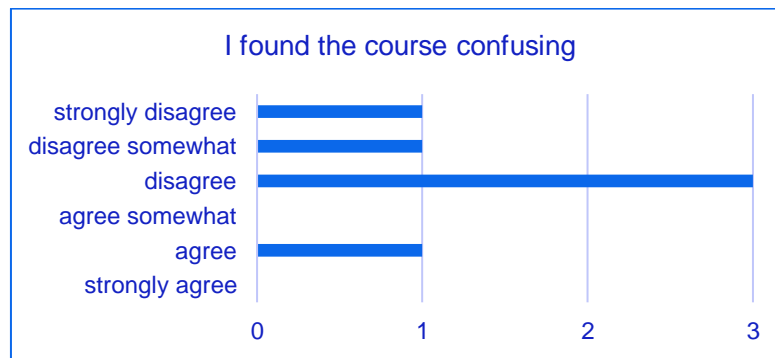


Figure 12: I found the course confusing

Regarding the content’s respondents’ **engagement and Interactivity** with the course, the half of the respondents agree with the statement that the course was fun and the other half disagree (Figure 13). Additionally, half of the respondents agree with the statement that the modules were easy to use and other half don’t (Figure 21).



Figure 13: The course was fun

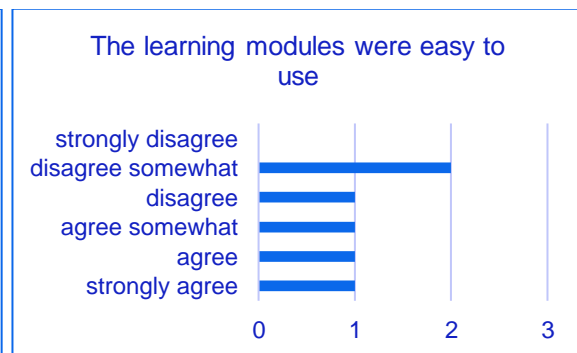


Figure 14: The modules were easy to use

Regarding the content’s **adaptability and accessibility**, four of the respondents agree with the statement that the language of the course was too technical (Figure 15).



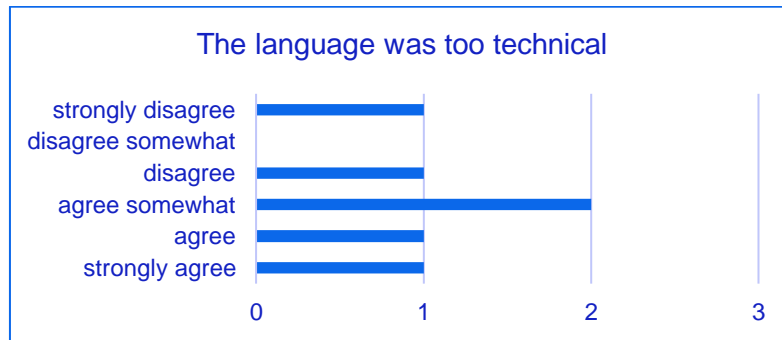


Figure 15: The language was too technical

Regarding the content’s **learning outcomes**, the majority of the respondents would recommend this course to friends and colleagues (Figure 16).



Figure 16: I would recommend this course to friends and colleagues.

For ‘Other comments and suggestions’, one respondent gave the following:

“Divide it in bits and present it on a regular basis. It was a lot of great work preparing the slideshow, but it could be improved making it similar to a videogame in terms of accessibility and usability. Add audio of reading the texts, or characters presenting it. It would be amazing to have AI capable of interpreting the user’s responses to questions and clues.”

3.2.3 Drivers and bicyclists course

The course was evaluated by twelve users, 66,7% identify themselves as males and 33,3% as females (Figure 17).



Gender Identity
12 responses

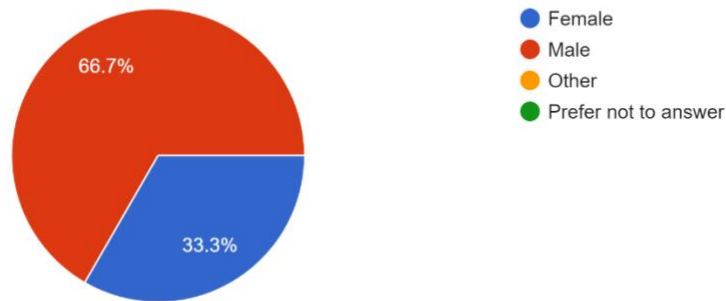


Figure 17: Responders gender identity

Regarding the age, ten responders were among 30 and 40 years old, while two were from 20 to 27 years old. All respondents have B car licence.

The respondents found their experience in general very pleasant. The words they used to describe it appear in the following table.

Table 5: Words used to describe the bicyclist and car drivers course.

| Positive | Negative |
|----------------|----------|
| Pleasant | n/a |
| Easy | |
| Educational | |
| Engaging | |
| Fast | |
| Fun | |
| Informative | |
| Interactive | |
| Interesting | |
| Pleasant | |
| Precise | |
| Comprehensive | |
| transformative | |
| Inclusive | |
| useful | |
| worth reading | |

The things that the respondents enjoyed the most during the course were

- The UI
 - The pictures that are there make the lesson easier to understand.
 - The graphs.
- The course



- It was well-structure, informative and comprehensive.
- It has organized structure.
- The content
 - Cyclist is vulnerable and it is necessary to improve the safety.
 - Combines useful and fun information with critical safety issues as to initiate the drives to a new approach/ mentality.
 - The cyclist tips for safe cycling

Regarding things that the respondents enjoyed the least during the course, two respondents did not liked the fact that there was no quiz in the end of the course, while one did not like the fact that the drivers' part was the same to the drivers-pedestrians course.

When the respondents were asked what is the most surprising thing they have learned from the course, the answers were related to the following:

- Bicyclists
 - The VRU safety system.
 - Statistics about health - realizing the health benefits.
 - Safe cycling tips.
- SAFE-UP project
 - The VRU safety system.
 - How SAFEUP improves the safety.

When the respondents were asked what is the most useful and the less useful thing they have learned from the course, the answers were the following.

Table 6: Most useful and least useful element of the training course.

| Most useful | Least useful |
|--|---|
| <ul style="list-style-type: none"> □ Driving skills <ul style="list-style-type: none"> ○ How we should move on the road with a bicycle. ○ The intelligent approach to improving the safety of cyclists. ○ Safety tips, e.g. helmet ○ The role of personal factors at driving ○ How much important are personal factors for the road safety □ Cycling tips <ul style="list-style-type: none"> ○ Safe cycling tips ○ all about cycling facts and benefits □ Course | <ul style="list-style-type: none"> □ Presentation <ul style="list-style-type: none"> ○ Exact numbers on safety (Figures and videos could be more helpful). |



| | |
|--|--|
| <ul style="list-style-type: none"> ○ push for V2X communication content synchronisation ○ How safe up can improve safety | |
|--|--|

After the end of the training, the majority of the respondents did not consider that something was missing other than the quizzes in the end that will be added.

In the important question of changing attitudes base on the course, three respondents said no, while the others will be more cautious for bicyclists, Give Ample Space, Check Blind Spots, Be Patient, Use Turn Signals, Avoid Distractions, Be Mindful of Bike Lanes.

About new learners, almost all the respondents found all the course elements important and interesting. Some of them identified some specific elements though, such as:

- That through this course they learn what to watch out for on the road.
- That through this course they learn about the consequence of dangerous driving.

About what the respondents would do differently, the majority of them will be more cautious when cycling and will be more cautious for cyclists when driving.

Regarding the acceptance and usefulness questions, regarding the content **relevance**, all respondents believe that the people can use the information from this course to improve the road safety. 6 agree, 5 strongly agree and 2 agree somewhat with the aforementioned statement (Figure 18).



Figure 18: People can use this information to improve their safety

Regarding the content's **accuracy and validity**, all the respondents disagree with the statement that the information was not a good match for their situation. 6 disagree, 4 disagree somewhat and 2 strongly disagree (Figure 19).





Figure 19: The information was not a good match for my situation

Regarding the content’s **clarity and organization**, all respondents disagree with the statement that the course confusing. 7 disagree and 5 strongly disagree with the aforementioned statement (Figure 20).



Figure 20: I found the course confusing

Regarding the content’s respondents’ **engagement and Interactivity** with the course, all respondents agree with the statement that the course was fun. 5 strongly agree, 4 agree and 3 agree somewhat with the aforementioned statement (Figure 21). Additionally, the majority of the respondents agree with the statement that the modules were easy to use. 6 strongly agree, 5 agree and 1 disagrees with the aforementioned statement (Figure 22).





Figure 21: The course was fun

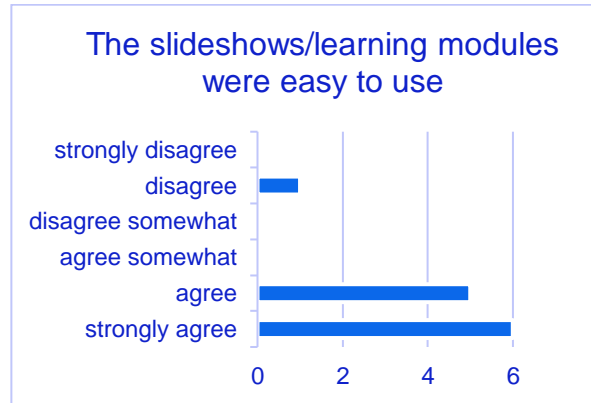


Figure 22: The modules were easy to use

Regarding the content's **adaptability and accessibility**, the majority of the respondents disagree with the statement that the language of the course was too technical. 6 disagree, 2 disagree somewhat, 2 agree somewhat and 1 agrees with the aforementioned statement (Figure 23).

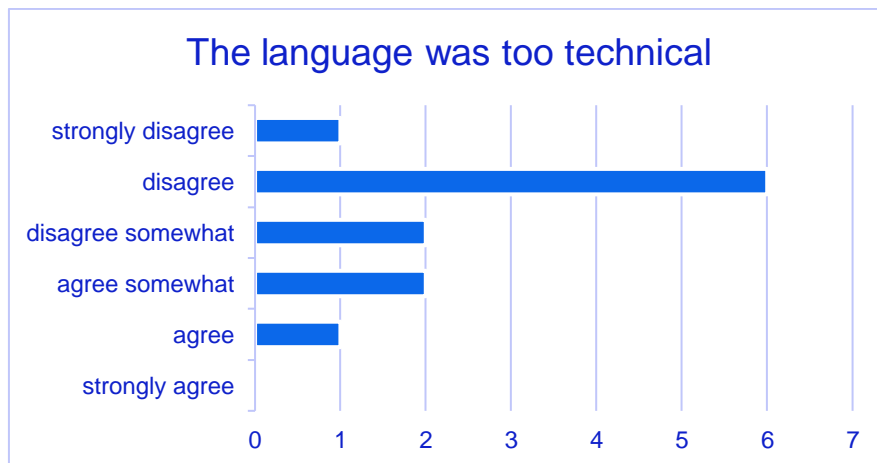


Figure 23: The language was too technical

Regarding the content's **learning outcomes**, we have already discussed about the impact of the training materials on the intended learning outcomes and the way that learners believe that they can express improved knowledge, skills, or behaviour as a result of engaging with the materials in the previous paragraphs. Additionally, all the respondents would recommend this course to friends and colleagues. 5 strongly agree, 5 agree and 1 agrees somewhat (Figure 24).



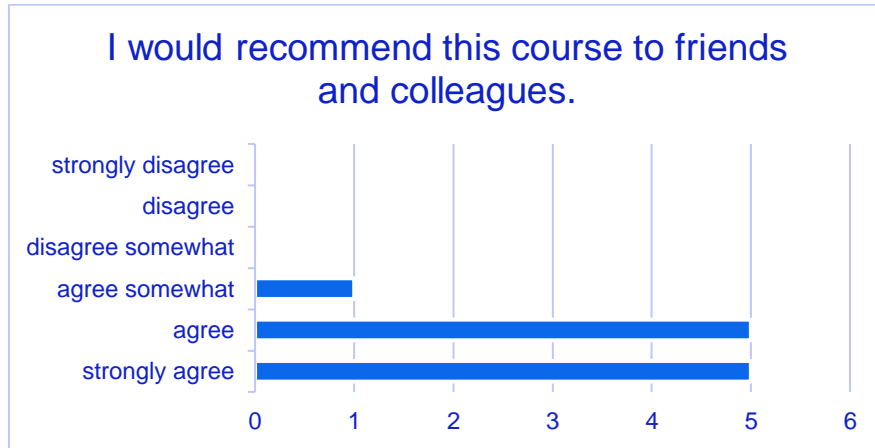


Figure 24: I would recommend this course to friends and colleagues.

No specific suggestions from the users were given for this specific course.

3.2.4 SAFE-UP demos course

The course was evaluated by fourteen users, 57,1% identify themselves as males and 42,9% as females (Figure 25).

Gender Identity
14 responses

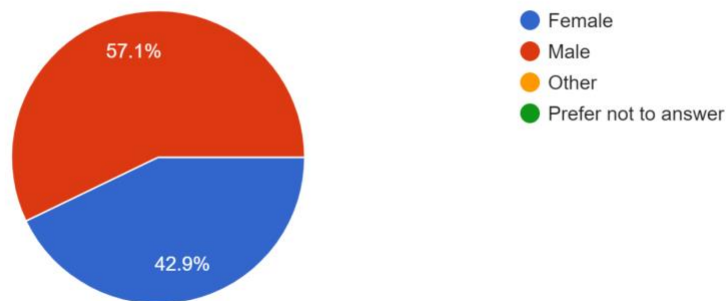


Figure 25: Responders gender identity

Regarding the age, ten responders were among 20 and 30 years old, four were among 31 and 43 while one was 61 years old. All respondents have B car licence.

The respondents found their experience in general very pleasant. The words they used to describe it, appear in the following table.

Table 7: Words used to describe the demo's course.

| Positive | Negative |
|--------------|-----------|
| Visual | Boring |
| Entertaining | Slow |
| Schematic | Confusing |



| Positive | Negative |
|-------------|-----------------|
| Technical | Not interactive |
| Innovative | |
| Short | |
| Interesting | |
| Innovative | |
| Educational | |
| Informative | |
| Enjoyable | |
| Fun | |

The things that the respondents enjoyed the most during the course were the following:

- The UI
 - The pictures, the videos and visuals.
 - Interesting videos
- The course
 - The structured layout, clear descriptions and interesting videos.
 - Has a nice flow, presenting the risks, the impacts and the mitigation part.
 - Condensed information supported by very good graphics.
 - Has a nice flow, presenting the risks, the impacts and the mitigation part.
 - Structure layout and clear descriptions.
- The content
 - The understanding about what is being done in SAFE-UP.
 - It is a very good summary of the SAFE-UP work, for outsiders.
 - New seating positions for highly automated vehicles.
 - The demos.

Regarding things that the respondents enjoyed the least during the course, there were two main comments. One was the lack of interactivity especially in comparison to the other courses, and the second was the lack of quiz in the end of the course. Also, for a few respondent the course was too technical for the general public.

When the respondents were asked what is the most surprising thing they have learned from the course, the answers were related to the following:

- Technology
 - The limitations of the technology.
 - The sensors capabilities.
 - The information about autonomous driving.
 - The mechanisms that need to be developed for imitating human behaviour by the AVs.
 - The communication framework for warning VRUs which will help to accident avoidance



When the respondents were asked what is the most useful and the less useful thing they have learned from the course, the answers were the following.

Table 8: Most useful and least useful element of the training course.

| Most useful | Least useful |
|---|--|
| <ul style="list-style-type: none"> ○ What the project has done. ○ How autonomous driving systems work. ○ Advanced intervention functions for VRU accident avoidance. ○ The whole communications scheme for the different parts to make automated driving a reality. ○ SAFE-UP assistance in accident avoidance ○ The technical details of the Communication framework for warning Vulnerable Road Users | <ul style="list-style-type: none"> ○ Some information that was too technical (i.e. details of the cars) |

After the end of the training, the majority of the respondents did not believe that something was missing other than the quizzes in the end that will be added.

In the important question of changing attitudes base on the course, three respondents said no, while the others felt more confident to use the technologies of the AVs.

About new learners, almost all the respondents found all the course elements important and interesting. Some of them identified some specific elements though, such as:

- That in the future the car is going to help you avoid conflicts.
- That technology in road safety is evolving quite rapidly. It can assist you or even do it better than you, in the future.
- That there are new functions of cars that drivers need to start learning and adapting to.

Regarding the acceptance and usefulness questions, regarding the content **relevance**, 10 the respondents believe that the people can use the information from this course to improve the road safety (4 strongly agree, 3 agree and 3 agree somewhat) while 4 respondents disagree with the aforementioned statement (Figure 26).





Figure 26: People can use this information to improve their safety

Regarding the content’s **accuracy and validity**, half of the respondents disagree with the statement that the information was not a good match for their situation while half agree with the aforementioned statement (Figure 27). This leads us to believe that this course should be considered for more automotive specialist and specific experts, rather general users such as drivers and road users.



Figure 27: The information was not a good match for my situation

Regarding the content’s **clarity and organization**, the majority of the respondents disagree with the statement that the course confusing (6 strongly disagree, 4 disagree and 1 disagrees



somewhat) while there are respondents 3 who agree with the aforementioned statement (Figure 28).



Figure 28: I found the course confusing

Regarding the content’s respondents’ **engagement and Interactivity** with the course, the majority of the respondents agree with the statement that the course was fun (6 strongly agree, 4 agree and 1 agrees somewhat) while there are 3 respondents who disagree with the aforementioned statement (Figure 29). Additionally, all the respondents agree with the statement that the modules were easy to use. 7 respondents agree, 5 strongly agree and 3 agree somewhat with the aforementioned statement (Figure 30).



Figure 29: The course was fun

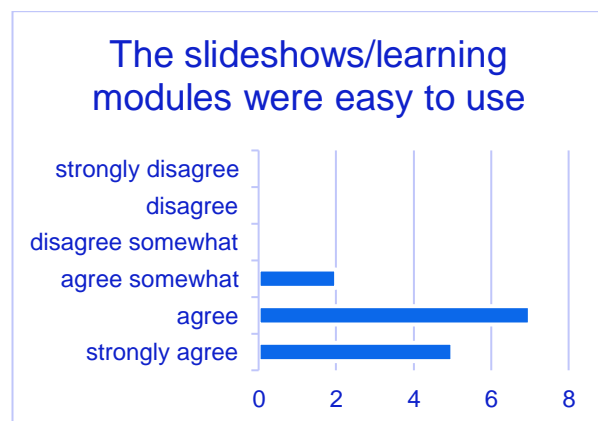


Figure 30: The modules were easy to use

Regarding the content’s **adaptability and accessibility**, the majority of the respondents, half found that the language of the course was too technical (Figure 31), something that verifies the conclusion drawn before also that the course is maybe too technical for the general public.



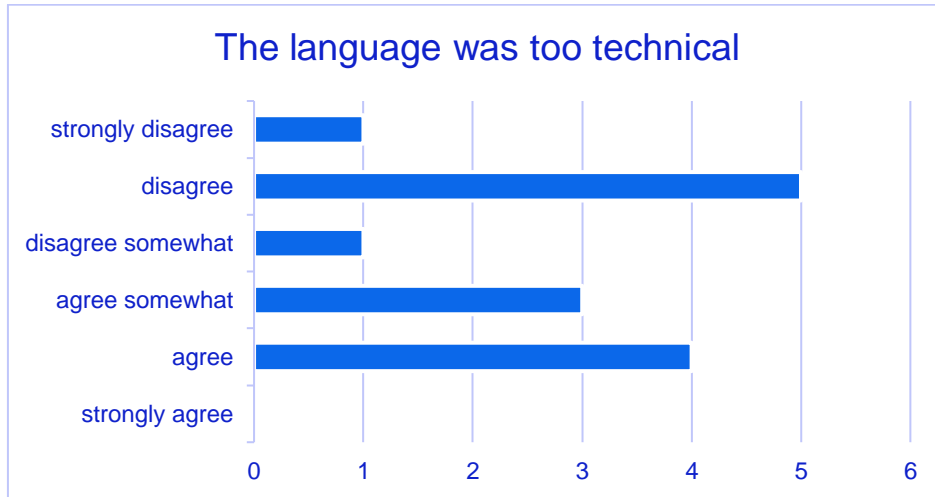


Figure 31: The language was too technical

Regarding the content’s **learning outcomes**, we have already discussed about the impact of the training materials on the intended learning outcomes and the way that learners believe that they can express improved knowledge, skills, or behaviour as a result of engaging with the materials in the previous paragraphs. Additionally, all respondents would recommend this course to friends and colleagues. 5 respondents strongly agree, 5 agree and 4agree somewhat (Figure 32).

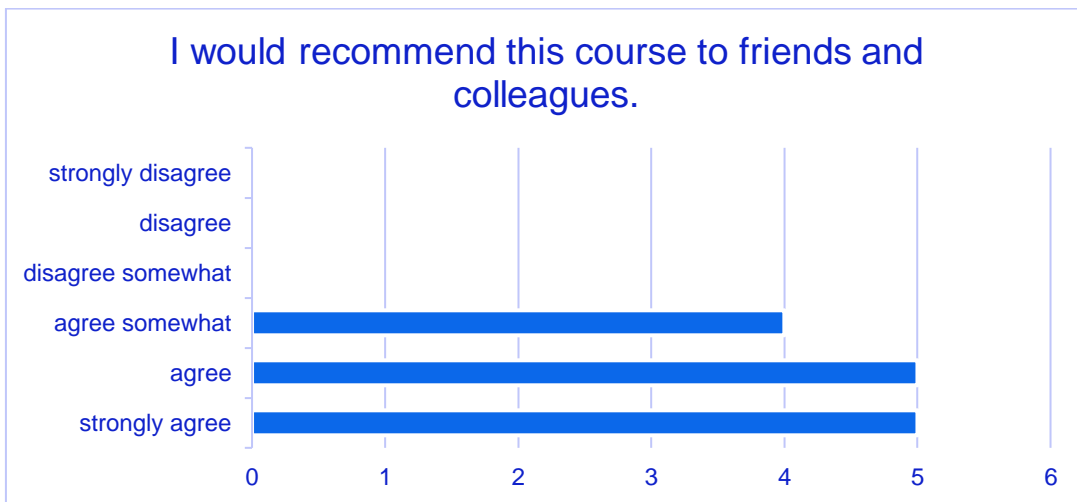


Figure 32: I would recommend this course to friends and colleagues.

Some comments that were included in the evaluation and will be taken into account at the final version of the report are the following.

| Suggestion | Action |
|---|---|
| In the Demo 1 video, there is also footage of Demo 4. That should be removed. We could add some video for Demo 2: We have this one: https://www.youtube.com/watch?v=- | The videos have been updated to match as possible |



| Suggestion | Action |
|--|---|
| BhYI6TKoBY And this one (from 0:44 to 1:03): https://www.youtube.com/watch?v=6WNNsHKFcng&t=78s | the proposal of the respondent. |
| It also needs proofreading and editing. There were quite some complicated sentences too. | Proofreading is done and minor spelling issues have been fixed. |
| It seemed like an informational text about the project, rather than a course that offers new knowledge, skills, and competencies to a specific subject | This is indeed an awareness and informatory course, rather than a training course. It is made to make people more familiar on SAFE-UP outcomes. |

3.2.5 Introduction to automation course

The course was evaluated by seventeen users, 58,8% identify themselves as males and 41,2% as females (Figure 33).

Gender Identity

17 responses

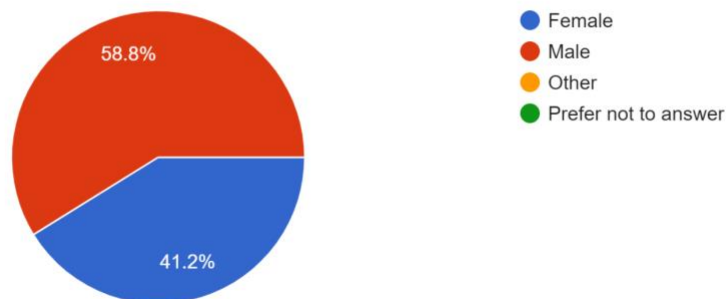


Figure 33: Responders gender identity

Regarding the age, eleven responders were from 20 to 30 years old, and the rest were between 30 and 49 years old. All respondents have B car licence.

The respondents found their experience in general very pleasant. The words they used to describe it, appear in the following table.

Table 9: Words used to describe the demo's course.

| Positive | Negative |
|------------|----------|
| Analytical | Vanilla |
| Clear | Shallow |
| Concise | Basic |



| Positive | Negative |
|----------------|----------|
| Descriptive | |
| Detailed | |
| Easy-going | |
| Educational | |
| Enlightening | |
| Explanatory | |
| Fun | |
| futuristic | |
| Informative | |
| Interactive | |
| Interesting | |
| Pleasant | |
| Surprising | |
| Well-conceived | |

The things that the respondents enjoyed the most during the course were

- The UI
 - The eLearning platform.
 - The videos that existed.
- The course
 - To know about the future automobile plans.
 - It has organized structure.
- The content
 - Clear structure layout, quiz at the end.
 - Includes a lot of information about automated driving the projects insights to the future of mobility.
 - The final part about SAFE UP solutions

Regarding things that the respondents enjoyed the least during the course, is that they missed links to more information and the fact that in some cases there were too many statistics. Additionally, some respondents found the course having too many information, sometime confusing and some others thought that it was lacking depth. That reveals the wide range of the general public which makes it hard for the researchers to cover all needs, especially in such a specific and technical topic.

When the respondents were asked what is the most surprising thing they have learned from the course, the answers were related to the following:

- Some facts about the impact of AVs.
- The risks of the AVs existence in traffic.
- How AVs work.
- Next step for a full automated future.



When the respondents were asked what is the most useful and the less useful thing they have learned from the course, the answers were the following.

Table 10: Most useful and least useful element of the training course.

| Most useful | Least useful |
|---|--|
| <ul style="list-style-type: none"> ○ Information about autonomous driving. ○ That we are far from seeing driverless vehicles soon. ○ The history of automation. ○ The self check ideas. ○ Benefits of AVs. ○ What are cooperative automated vehicles. ○ Considerations of automation. ○ How automated vehicles will work. | <ul style="list-style-type: none"> ○ The history of automation. |

After the end of the training, the majority of the respondents did not consider that something was missing other than a most details presentation of SAFE-UP that already exists in another course.

In the important question of changing attitudes base on the course, many respondents said that they will trust more the technologies towards the AVs.

About new learners, almost all the respondents found all the course elements important and interesting. Some of them identified some specific elements though, such as:

- The levels of automation should be known by every new learner.
- The drawbacks of automation and new types of risks imposed with the use of AVs.

Regarding the acceptance and usefulness questions, regarding the content **relevance**, the majority of the respondents believe that the people can use the information from this course to improve the road safety. In more detail, 8 respondents agree, 4 strongly agree and 3 agree somewhat with the aforementioned statement. Additionally, 2 respondents believe that people cannot use the information from this course to improve the road safety (Figure 34).





Figure 34: People can use this information to improve their safety

Regarding the content's **accuracy and validity**, the majority of the respondents disagree with the statement that the information was not a good match for their situation. In more detail 8 disagree, 3 strongly disagree and 3 disagree somewhat (Figure 35). There are still 3 participants who think that the information was not a good match for their situation.



Figure 35: The information was not a good match for my situation



Regarding the content’s **clarity and organization**, the majority of the respondents disagree with the statement that the course confusing (Figure 36). 16 people disagree and only one agrees with the aforementioned statement.



Figure 36: I found the course confusing

Regarding the content’s **engagement and Interactivity**, all respondents agree with the statement that the course was fun. In more detail, 7 strongly agree, 4 agree somewhat and 3 agree with the aforementioned statement, while two disagree somewhat and one disagrees (Figure 37). Additionally, the majority of the respondents agree with the statement that the modules were easy to use. In more detail, 9 agree, 6 strongly agree, one agrees somewhat and one disagrees somewhat with the aforementioned statement (Figure 38).



Figure 37: The course was fun

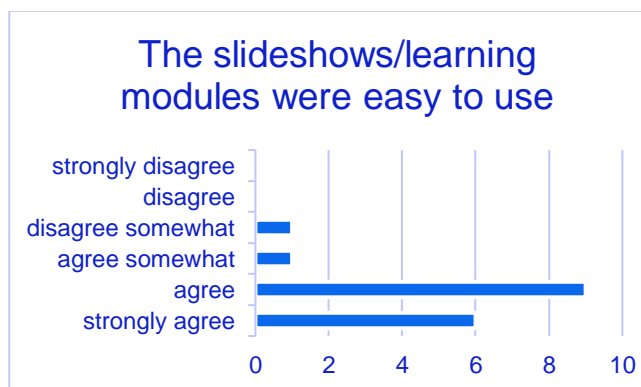


Figure 38: The modules were easy to use

Regarding the content’s **adaptability and accessibility**, more than half of the respondents disagree with the statement that the language of the course was too technical. In more detail,



4 disagree somewhat. 4 disagree, 1 strongly disagrees and 6 agree somewhat, one agrees and one strongly agrees (Figure 39).

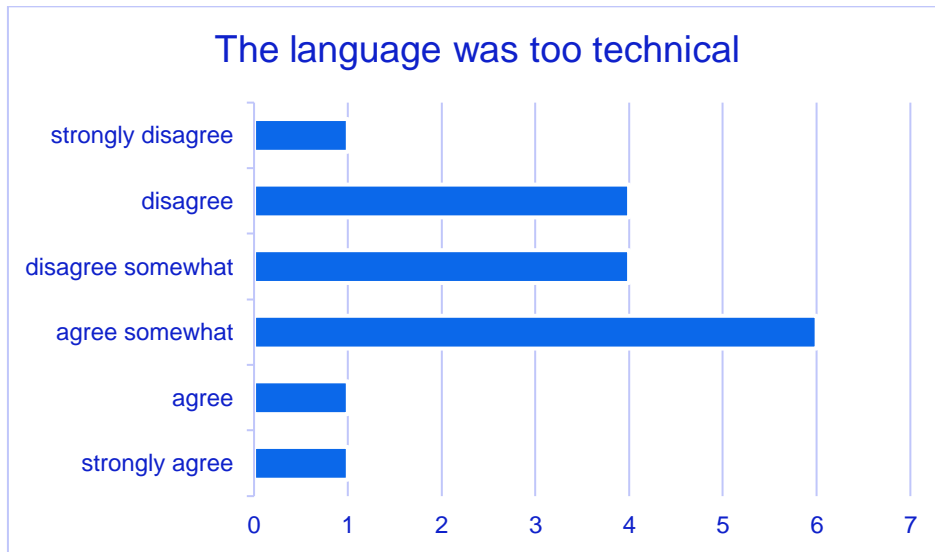


Figure 39: The language was too technical

Regarding the content’s **learning outcomes**, we have already discussed about the impact of the training materials on the intended learning outcomes and the way that learners believe that they can express improved knowledge, skills, or behaviour as a result of engaging with the materials in the previous paragraphs. Additionally, the majority of the respondents would recommend this course to friends and colleagues. 5 strongly agree, 5 agree and 5 agree somewhat, while 2 disagree somewhat (Figure 40).

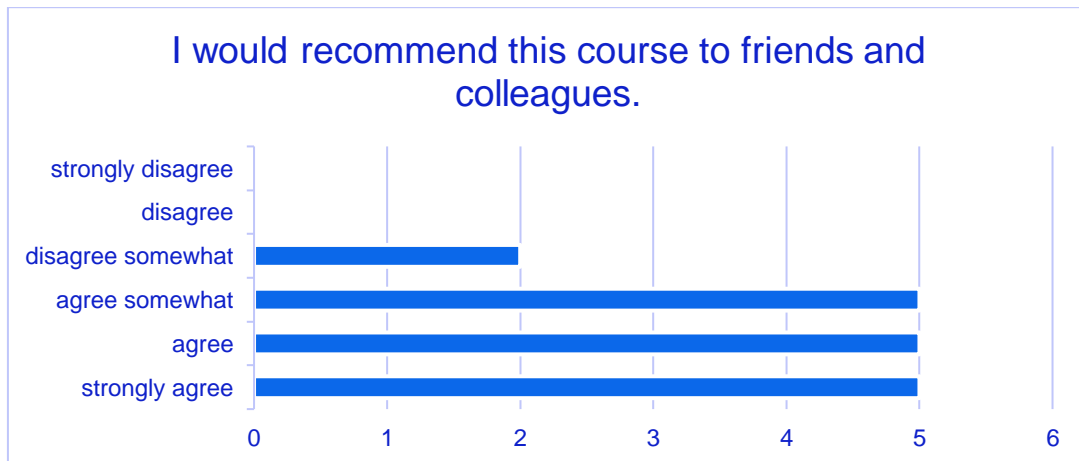


Figure 40: I would recommend this course to friends and colleagues.

Some specific points to improve from the respondents are the following, accompanied by specific actions to tackle them:



| Suggestions | Actions |
|--|------------------------------------|
| <p>In the first page of the "How SAFE-UP technologies can improve safety through Automation" section, I don't find the image of working, in the future car, so appealing. On the contrary, i find it a little bit irritating and that it goes against the work-life balance that is, nowadays, being promoting (not only by the media, but also by WHO, EU, Psychological Assosiations, etc)</p> | <p>The image has been removed.</p> |

3.3 Evaluation with experts

3.3.1 Introduction

The evaluation with experts was realized both online, by providing them with the questionnaires for the experts (see Section 2.4) and also at 2 online Workshops. The first online workshop was realized on the 9th of May with 20 expert participants and was focused on the PTW training course. The second one was realized on the 11th of May with 8 expert participants and was focused on all the other training courses, namely the drivers-pedestrians course, the drivers-bicyclists course, the introduction to automation course and the SAFE-UP demos course. The figure that follows, was capture after the consent of all participants and it illustrates the discussion of the Workshop of the 11th of May.

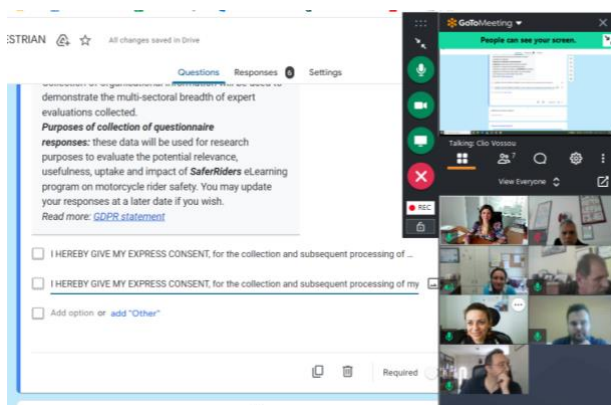


Figure 41: Screenshots from the SAFE-UP training workshop on the 11th of May.

3.3.2 Drivers and pedestrians course

This course was evaluated by 7 users. The areas of expertise of the respondents are the following:

- Pedestrians & public space.



- Research on vehicle safety and vehicle-user interaction (incl. VRU), including autonomous vehicles. Development of training material and tools for road safety addressing all user groups.
- Education, Research on micro mobility-related risks and alcohol impairment.
- Vehicle Dynamics.
- HMI, elderly, VRUs, etc.
- Accident Prevention in Transportation and Mining using advanced technologies (driving and heavy machinery simulators, software, roll over cars and seat belt convincers, trainings, audits, research and development).
- Drivers training for people with disabilities.

The organization of the experts varies, having one respondent from NGO, one OEM, one Research Centre, one from Federation, two from universities and one from other non-defined (Figure 42).



Figure 42: Which best describes your organisation.

Regarding the primary activities that are aligned with road user safety, the respondents declared the following:

- Information provider/ knowledge hub, advocacy for road users, policy development
- Safety promotion, risk reduction, safety research & testing, technology innovation, translation, mobilisation, dissemination of research results, safety initiatives, campaigns, public outreach, policy development, road transport design or management, education and training
- Safety research & testing, translation, mobilisation, dissemination of research results, education and training



- Safety research & testing, technology innovation, safety initiatives, campaigns, public outreach, education and training
- Safety promotion, risk reduction, safety research & testing, technology innovation, information provider / knowledge hub, translation, mobilisation, dissemination of research results, safety initiatives, campaigns, public outreach, road transport design or management, education and training
- Safety promotion, risk reduction, safety research & testing, technology innovation, translation, mobilisation, dissemination of research results, safety initiatives, campaigns, public outreach, advocacy for road users, road transport design or management, education and training
- Education and training

Regarding the question if the content addresses identified needs for road user knowledge and skills the majority of the users agree. Only one user thinks that the content does not address the need of the target audience (Figure 43). According to the comments of the users the course covers identified needs related to safety needs for passengers and drivers. It also addresses probably the project scenarios, but still there are scenarios and users, with personalized mobility restrains for example, that were not included. However, such a course cannot be exhaustive, but needs to be flexible enough for future updates.

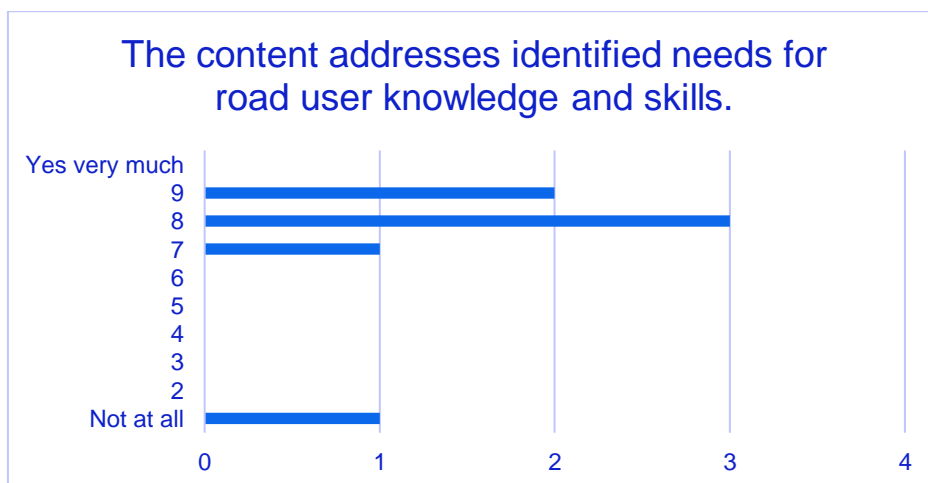


Figure 43: The content addresses identified needs for road user knowledge and skills.

Regarding the question, if the course addresses recognized gaps in road user training and safety awareness, the majority of the experts were very positive, providing comments such as “Yes, by offering an integrated approach that addresses the role of all road users in incident and crash creation.”, “It does, though there is inclusion for all users, with increasing empathy as I got was the purpose, however that makes the comprehension and assimilation a bit more difficult.”, “Definitely yes”. Only one user thinks that the course does not addresses recognized gaps in road user training and safety awareness (Figure 44).



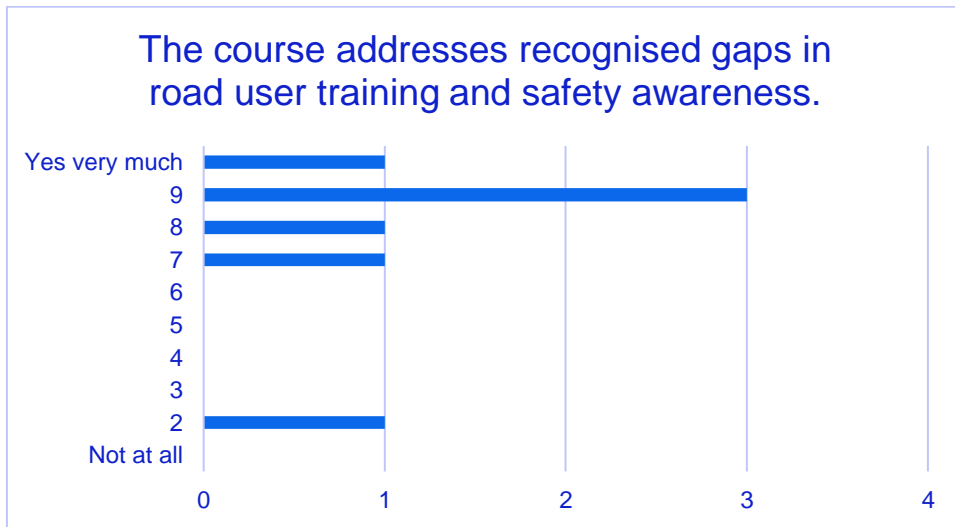


Figure 44: The course addresses recognised gaps in road user training and safety awareness.

Regarding the question if the approach reflects evidence-based recommendations for driver training and/or safety awareness programs, the majority of the experts were very positive, providing comments such as “Yes, it contains recommendations from the WHO and adopts ICBC methods”, “References are abundant across the course material, so it reflects that its creation was evidence-based”, “Yes, towards defensive driving rules, but it should be further extended”. Only one user thinks that approach does not reflect evidence-based recommendations for driver training and/or safety awareness programs (Figure 45).

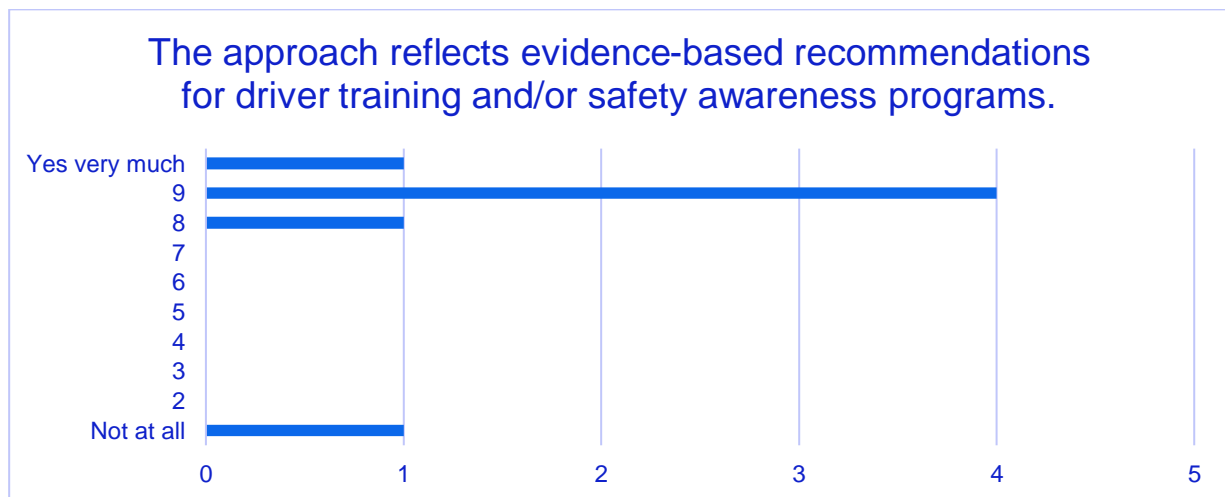


Figure 45: The approach reflects evidence-based recommendations for driver training and/or safety awareness programs.

Regarding the question if the course has the potential to contribute to improved safety for unprotected road users (pedestrians or cyclists), the majority of the experts were very positive, providing comments such as “Certainly. Pedestrian association could use the material to advocate training for pedestrians, so that they could identify threats in the road and realize ways to counter them”, “Probably yes, that kind of users have lack of training”, “With future in mind, yes it does”. Only one user thinks that the course does not have the



potential to contribute to improved safety for unprotected road users (pedestrians or cyclists). (Figure 46).

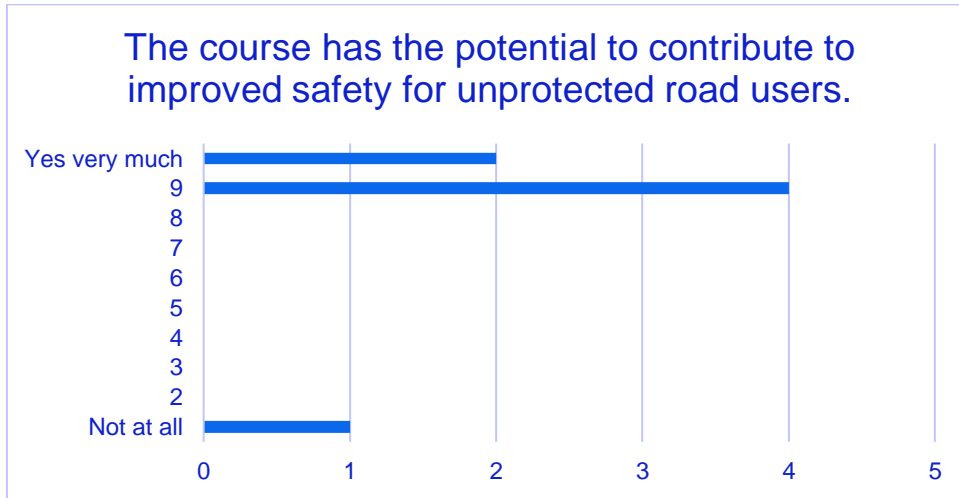


Figure 46: The course has the potential to contribute to improved safety for unprotected road users.

Regarding the question if the course has relevance for target audiences beyond individual road users, the majority of the experts were very positive, providing comments such as “For sure”, “This course is ideal for use from central administration (Ministries for Education and/or Transportation) and NGOs”. Only one user thinks that the course does not have the potential to contribute to improved safety for unprotected road users (pedestrians or cyclists). (Figure 47).

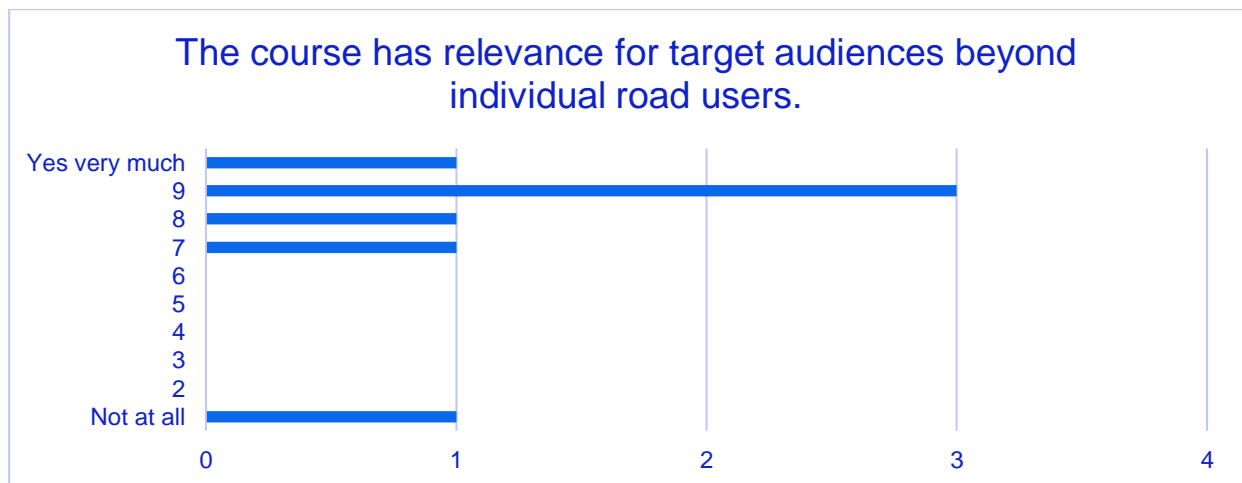


Figure 47: The course has relevance for target audiences beyond individual road users.

Regarding the question if the course provides missing and/ or new information, the majority of the experts were very positive, providing comments such as “For sure. It entails innovations in knowledge and developments”, “Multimedia content is always better!”. Only one user thinks that the course does not provides missing and / or new information. (Figure 48).



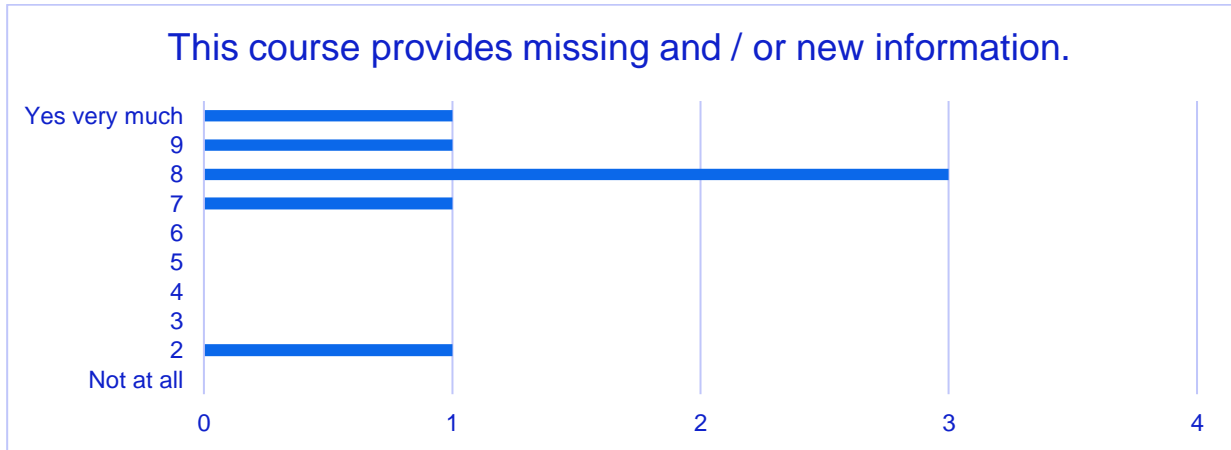


Figure 48 This course provides missing and / or new information.

Regarding the question if the course should be shared and implemented, the majority of the experts were very positive, providing comments such as “Yes, provided that there will be synergies with relevant actors.”, “Before it is shared, we might consider some of the information to be made even more in layman’s terms and emphasize that the aim is to create a community of common understanding and exchange of knowledge, i.e. the empathy you mentioned at the beginning of the course, by one actor getting into the shoes of the other, so they understand of the mix-and-match of material.”, “Definitely yes!”. Only one user thinks that the course does not believe that this course should be shared not implemented. (Figure 49).

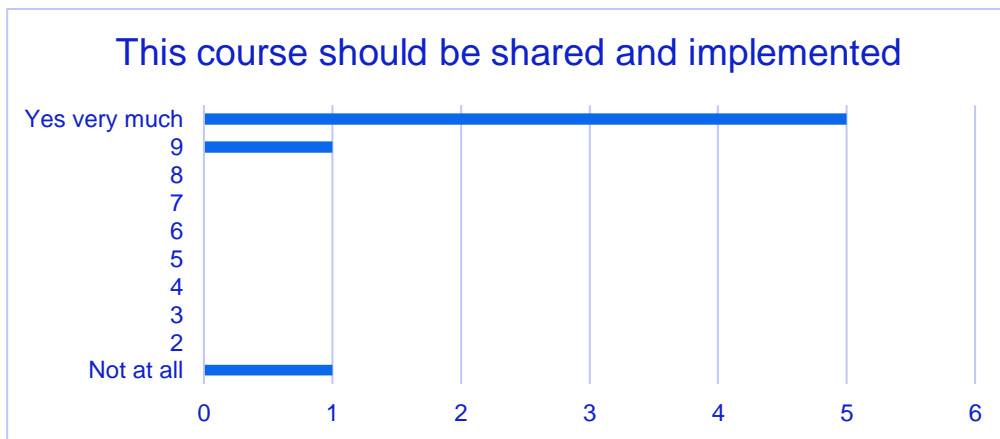


Figure 49: This course should be shared and implemented

Regarding the question if the course stimulates new research or policy questions/directions, the majority of the experts were very positive, providing comments such as Yes. The recalibration of road safety knowledge in the framework of autonomous driving is important and this tool has the potential to contribute significantly”, “Research questions and policy directions are two different things and might need different answers in each. Research questions are created for sure, especially if the results of the studies/ tests of SAFE-UP are made available along with the answers to the SAFE-UP KPIs/ RQs if any. Policy directions



require more evidence to be set.”, “Definitely yes! Further research on autonomous vehicles research” (Figure 50).



Figure 50: This course stimulates new research or policy questions/directions.

Regarding the question who needs this course there were various answers. Most respondents believe that the driving schools and the driving instructors need the course. Next, the respondents believe that the new and pre-licensees as well as the Safety Councils need the course. The respondents believe that the stakeholders who need this course the less is the policy & decision makers (Figure 51).

Who needs this course?

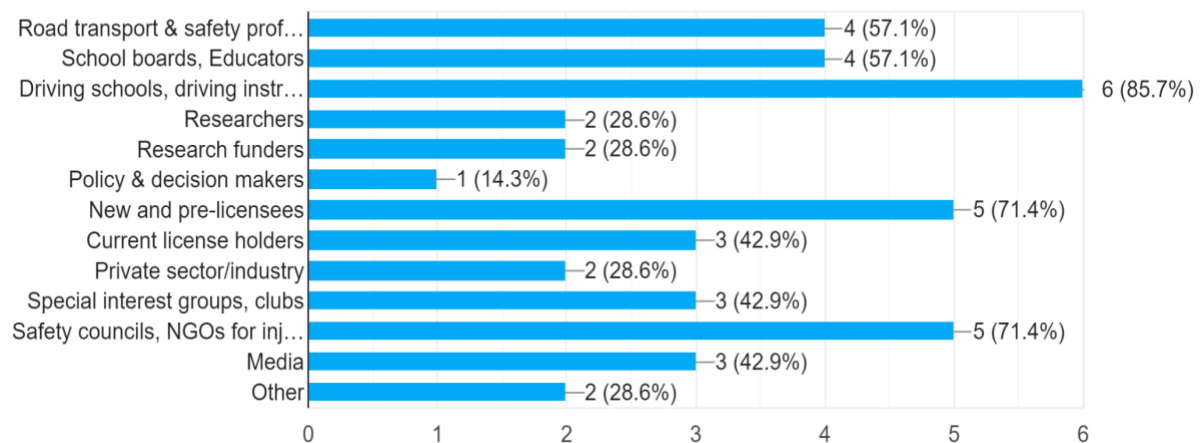


Figure 51: Who needs this course

Regarding the questions about what in this course works well, there were various answers from the respondents.

- the initial mention that we should not use the word accident



- Nice visualisations and examples
- Sequence of information, clarity and the "fun" factor.
- The visualization of concepts such as breaking distance.
- Layout, evidence-based information, demos.
- Simulators scenarios
- Provides knowledge

Regarding the questions about what in this course needs in terms of improvement and / or further development, there were various answers from the respondents.

- Perhaps there is some overlap between the different courses.
- Structure, objectives, examples before quizzes.
- The videos should be improved (no realistic interaction between reality and human)
- Update of the curriculum based on specific needs of specific countries

From the aforementioned results, we see that the majority of the respondents are satisfied with the course. Nevertheless, there is one expert in particular who was quite negative towards training of pedestrians specifically and in general. Additional insights have been shared with the team who developed the training, highlighting concerns and shortcomings of the e-learning course. Some of them were very productive, such as the ones regarding the simulation videos that were revealing some unrealistic depictions of cities, such as excessive speed limits, and absence of diverse road users. We acknowledge these observations regarding the simulated city streets, and we apologize if they did not accurately represent the urban environments in Europe. Our intention was to create a visual representation that encapsulated various scenarios and challenges that drivers may encounter. However, we appreciate the feedback and will take it into consideration for future revisions.

There were also some other suggestions regarding the focus of the course, and that it should shift from targeting pedestrians to educating drivers and decision makers, emphasizing the importance of reducing speeds and promoting sustainable safety. This specific course was designed with the intention of promoting road safety for all road users. We understand the concerns about potential victim-blaming and would like to clarify that our aim is to present the different perspectives and behaviours of road users without singling out any particular group for blame. Our goal is to create awareness among drivers and decision makers about the diverse range of users outside the vehicle, including pedestrians and cyclists. By highlighting these perspectives, we hope to encourage drivers to consider the presence of these users and adapt their behaviour accordingly.

There was also a recommendation to target drivers and decision makers more explicitly, and we completely agree. Our aim is to educate and raise awareness among these key stakeholders, emphasizing the importance of reducing speeds and promoting sustainable safety measures. We also recognize the need to avoid generalizing "pedestrians" as a



homogeneous group and will strive to create course materials that address the diversity and unique needs of different demographics in future projects that will specifically target these groups.

The suggestions for not indulging in victim-blaming and placing responsibility on the vehicle operators, infrastructure managers, and decision makers align with our overall philosophy. We are committed to promoting a safe and inclusive road environment where responsibility lies with all stakeholders involved.

We genuinely appreciate the feedback received, as it helps us identify areas for improvement and further research. We understand the need for a comprehensive revision of the training course, and we are committed to ensuring that it aligns with the latest research and best practices in road safety.

3.3.3 Safe Rider’s course

3.3.3.1 Feedback from expert evaluation form

The course was evaluated by 6 users from Germany, Belgium, Sweden, Italy, France and Greece. One of the respondents had only viewed Unit 1 of the 4 units. All respondents were male. Three of the respondents self-declared as representing their organizations while three completed the evaluations as individuals. Figure 52, shows the range of organizational types for the expert evaluators.

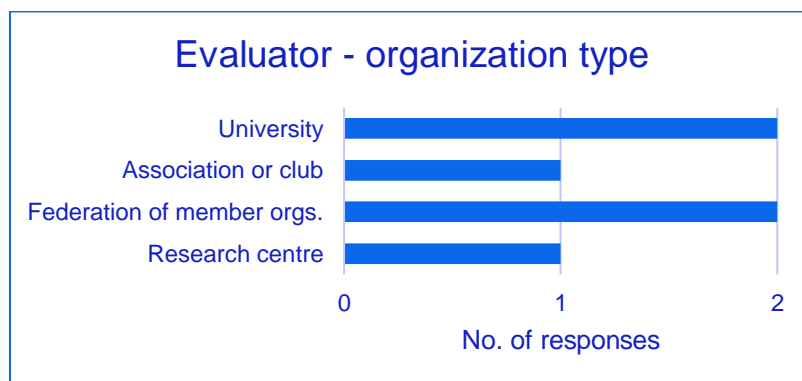


Figure 52: Organisation type

The respondents’ organizations represented a wide range of domains and sectors dealing with motorcyclists’ safety (Figure 53).





Figure 53: Organization's activities

The range of expertise of the evaluators provided a good representation of different sectors and domains related to motorcycle safety:

- Rider behaviour, hazardous situations, infrastructure, etc.
- Policy lobbyist and motorcyclists’ advocate developing guidelines on infrastructure, testing of new vehicle systems (specifically automated car driving functions that impact motorcyclists’ safety), driver licensing.
- Motorcycle safety and advanced riders training.
- Vehicle technology, accident analysis, rider behaviour.
- Researcher in naturalistic riding studies including vehicle instrumentation for data collection, motorcycle perception and visibility, rider behaviour, motorcycling simulators, traffic flow.
- Active safety systems.

Three of the evaluators also attended the May 9 online workshop. Some of their inputs in the evaluation form were used to illustrate critique of the SaferRider’s course and stimulate discussion amongst the workshop attendants.

Regarding the acceptance part of the questionnaire, most of the users were positive (Figure 64). The users pointed that the content is **good** and **relevant**, is **needed** by riders as traffic crashes persist and also that some content is less relevant and may distract from the main purpose. More specifically the following comments were made “1) *anticipation is the key for safety, anticipation is not only understanding a situation but also being able to predict the behaviour of a system (and of course of other road users)... 2) the analyses of past crashes (MAIDS is old) is interesting but not sufficient, one must anticipate on future potential risks*



due to behavioural changes (new distractors like phoning and texting for instance) 3) the socio cultural aspects are poorly taken into account (the only accident database is GIDAS (Germany), and the reference for training is Canada and Great-Britain... Anglo-Saxon only... 4) what about low incomes countries?"

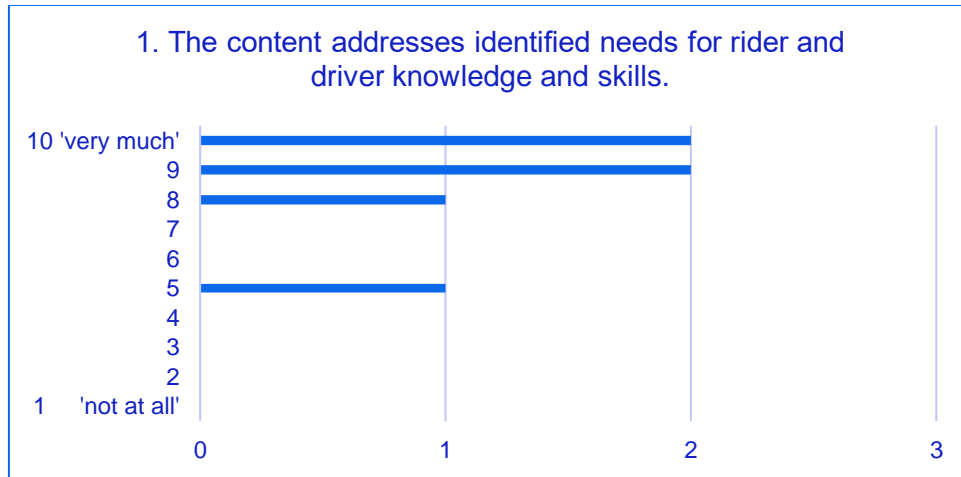


Figure 54: The content addresses identified needs for rider and driver knowledge and skills.

Regarding the question on how the course addresses recognised gaps in motorcycle rider training and safety awareness most of the users answered in a positive manner (Figure 65). The specific questions got comments such as “The content misses crashes between motorcycles and bicycles or pedestrians (miss regional relevance, despite the focus on data from urban areas. This is important in the face of increasing focus on “active mobility”, “Yes, a problem area can be for the new rider to remember/understand/practice what he learns. Experience takes time!”, “The only flaw here could be that the gaps are sometimes not enough evaluated, but this cannot be blamed on Safe-Up.”, “Recognised in Europe and North America, what about low or middle incomes countries (Africa, India...)? What about other cultures?”

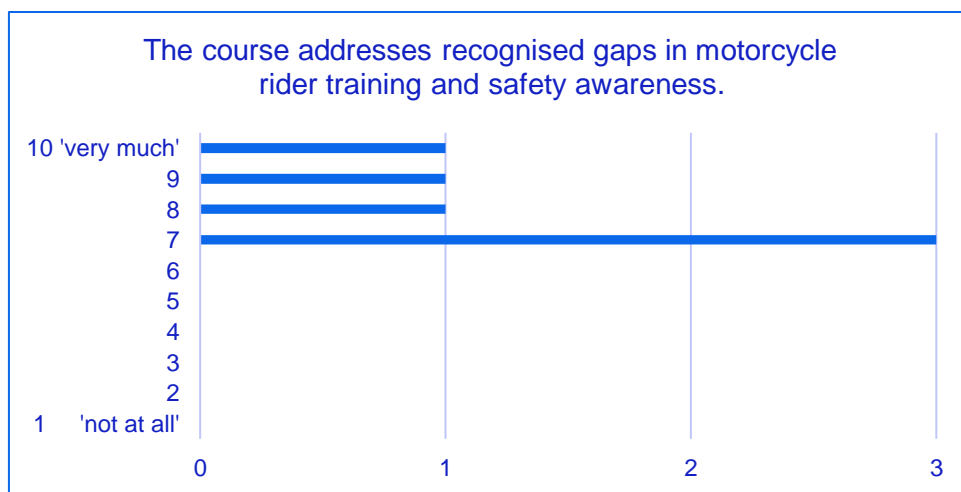


Figure 55: The course addresses recognised gaps in motorcycle rider training and safety awareness.



Regarding the question on if the approach reflects evidence-based recommendations for rider or driver training programs, most respondents were positive (Figure 66). The specific questions got comments such as *“Have also in mind that the academic world frequently states that training [programs] have no effect on rider safety!”*, *“Always the same, yes for Europe and North America, but what about the rest of the world? Evidence-based is not always sufficient, one [type of] evidence for somebody (let say a car driver) is not always the same as a [type of] evidence for another (e.g. a motorcyclist).”*

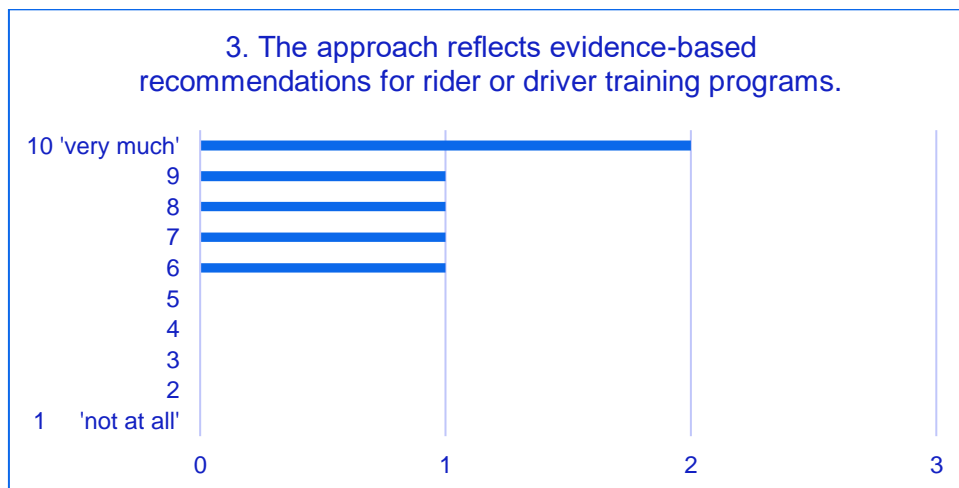


Figure 56: The approach reflects evidence-based recommendations for rider or driver training programs.

Regarding the question if the course has the potential to contribute to improved safety for motorcyclists, all the respondents were positive (Figure 67). The specific questions got comments such as *“Yes, with some technical improvements, more structure on the slides and a better focus on relevant information and less distraction by too many boxes.”*, *“Yes. If we can get people to take the training. I must recommend that riders do this in group, to get the discussion going...which [is] hard when you do it on your own.”*, *“A lot of knowledge and thinking. Need to translate to everyday riding.”*, *“Long, sometimes boring, only in English... in addition the targeted population and the way to motivate this population is not clear. Many aspects have to be treated at school as the road safety start at the early age.”*



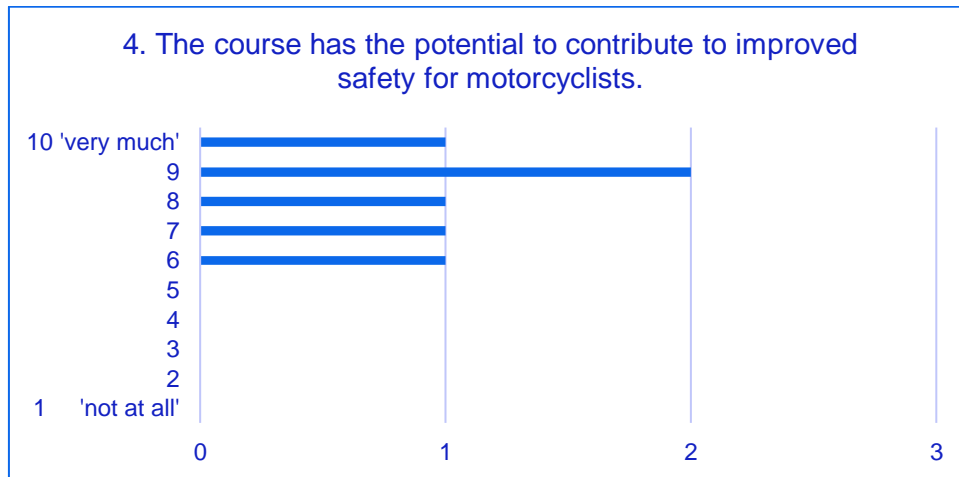


Figure 57: The course has the potential to contribute to improved safety for motorcyclists.

Regarding the question if the course has relevance for target audiences beyond individual road users most respondents were positive (Figure 58). The respondent who was not positive made a comment that he/ she did not understand the question “I put a 6 in the box because I do not understand what is meant with “target audiences beyond individual road users.” The specific questions got comments such as “Yes, it’s about various groups in the traffic – which I like it for.”, “Up to some extent, if translated, if shortened.”, “It contains lots of ideas for a range of stakeholders.”

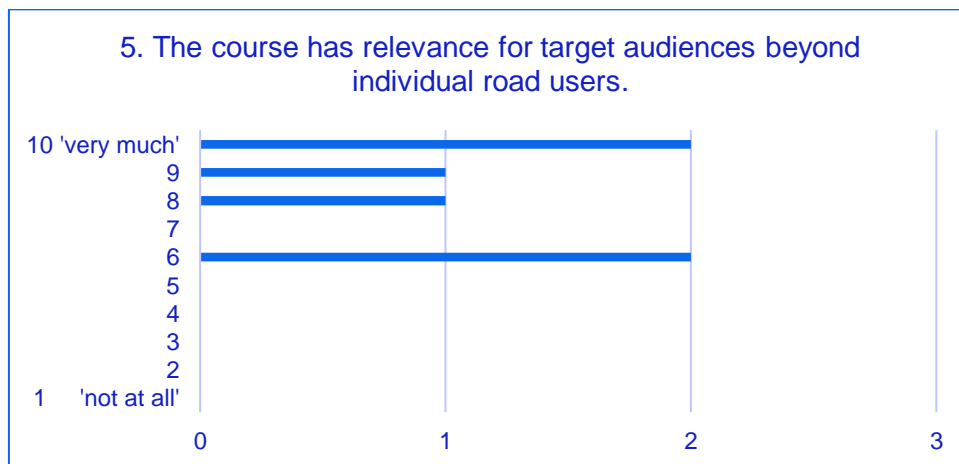


Figure 58: The course has relevance for target audiences beyond individual road users.

Regarding the question if the course provides missing and / or new information most respondents were positive (Figure 69). The specific questions got comments such as “Not necessarily new if you are deep in the topic but it is an excellent composition and especially presentation.” “I did not see anything new, but that does not discredit the course. I would see it as a problem for myself if it was the other way round.” “Indeed, the results of the research [are] badly known by non-researchers.” “More than new knowledge, the course provides new ways to communicate and teach based on up-to-date knowledge.”



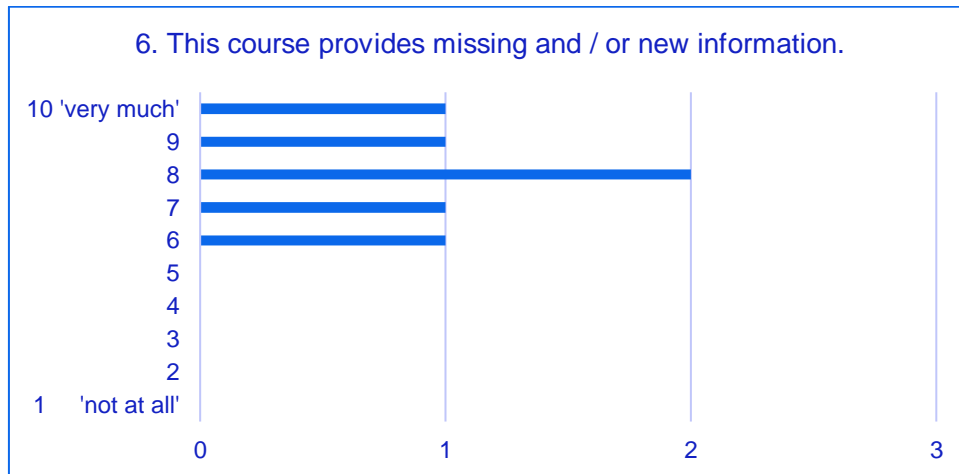


Figure 59: This course provides missing and / or new information.

Regarding the question if the course should be shared and implemented most respondents were positive (Figure 60). The specific questions got comments such as “Yes, with some improvements.”, “Absolutely – use MC organisations – MC manufacturers etc. to distribute.”, “Everybody active in the field of rider training would make use of the contents of the course.”

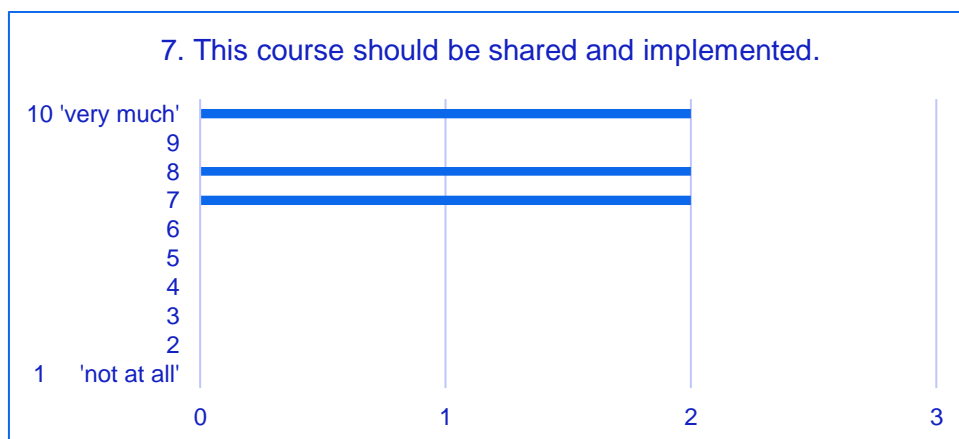


Figure 60: This course should be shared and implemented.

Regarding the question if the course stimulates new research or policy questions/directions most respondents were mediocre with few of them being on the negative side and few of them being at the positive site (Figure 61). The specific questions got comments such as “The present focus of lawmakers and governments is on low speed skills. In the proposal for the 4DLD the European Commission has added the requirement of hazard detection by simulation as part of the theoretical test, but that is not enough and does not stimulate driving schools to have more attention for hazard perception, assessing and managing risks, and finding and applying the right solutions, next to the now common technical skills and a more strategic approach to riding.”



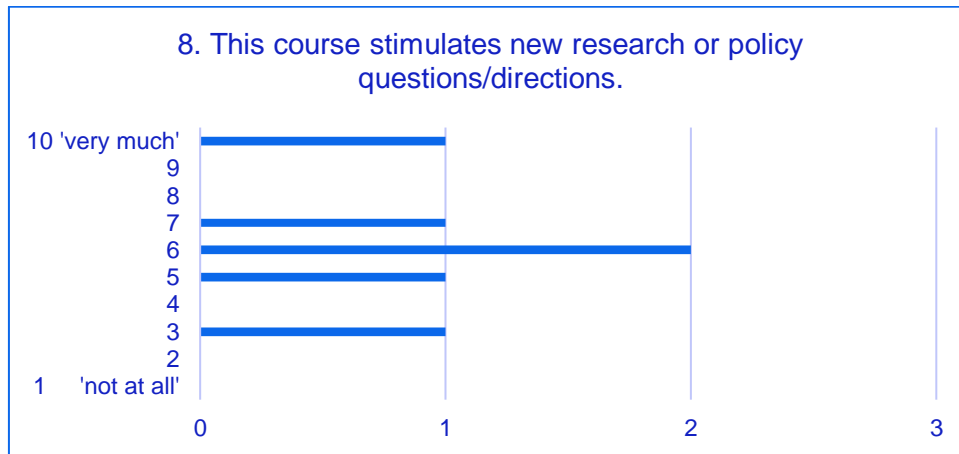


Figure 61: This course stimulates new research or policy questions/directions.

The next Section of the survey, Section IV Consists of 4 questions on suggestions for improvement, dissemination and implementation.

Specifically, regarding the question on who needs this course the majority of the respondents believe that the school boards and educators need it the most (Figure 62). One respondent did not select any of the options but in comments, said the priorities are car and motorcycle drivers but that all above could be target knowledge users, hinting at the need to adapt the content to suit each. The specific questions got comments such as: *“The course seems to target a very broad group of stakeholders, who all have their different needs for information. The needs and the starting point of a few, pre-licence rider are completely different [from] that of the professionals. New riders will be overwhelmed by the amount of data, while the professional might get bored because of the repetition of information.”*, *“What we need is primarily an acceptance of the issues around PTW’s – and the PTW users to understand problems about speeding!”*

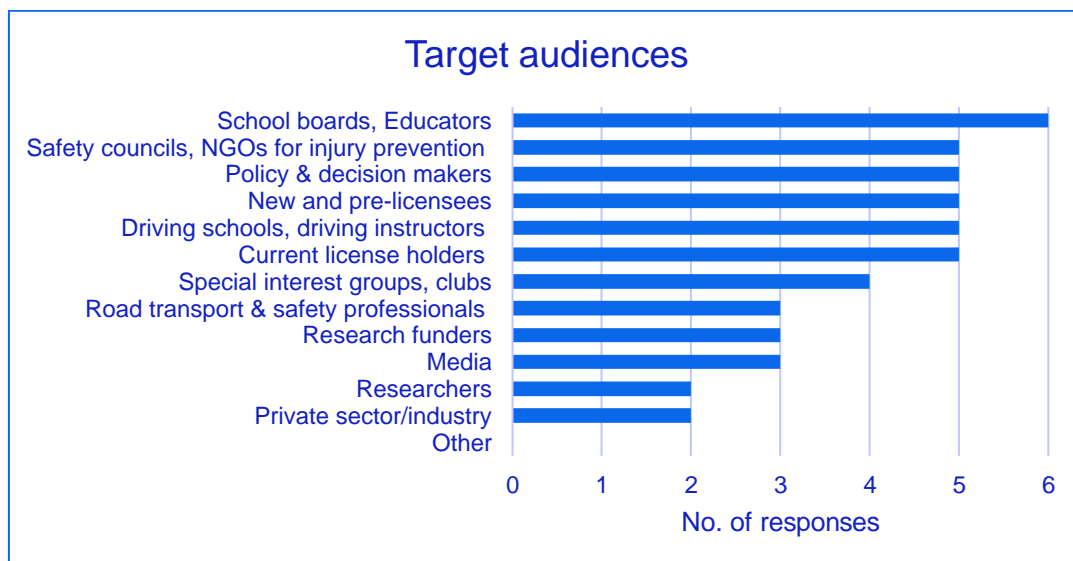


Figure 62: Target audiences.

Regarding the questions about what in this course works well, there were various answers from the respondents.

- “It is a well-structured and good collection of data for the experienced rider who is helped with information that he/she did not get before. Also, professionals who are not specialized in motorcyclists' road safety will learn much that they did not know.”
- “Very nice graphics – love the boxes w facts.”
- “The multi-media part.”
- “It provides material for excellent brainstorming and exchange of experience between riders, for improved safety awareness, with solid references about what the correct answers and figures are.”

Regarding the questions about what in this course needs in terms of improvement and / or further development, there were various answers from the respondents.

- “Better structure on the slides (less boxes, better indication and structure about the information they contain). On some places more contrast between letters and background (some boxes are really hard to read). Leave out the exercises in Unit 2: the first is of kindergarten level, the second did not seem to work and/or I did not understand how it works.”
- “Love the start with stating that Crashes are predictable – you got my attention! There may be too much intro with academic references, think about taking this in the end instead – and start with the way to find out why crashes are predictable.”
- “The way the material is presented. It was an excellent job, but passing the material to media content creators would turn the course into something more accessible and usable.”
- “Please make it less complicated and cleaner. Now it contains too much information for the purpose.”

3.3.3.2 Expert feedback collected during the online workshop

In addition to the meeting administrator (BAX) and host (UNIFI-WP6) twenty-nine guest experts interested in motorcycling safety attended the workshop. Figure 63 shows a good representation across European countries and beyond, including Canada and the USA. Three attendees were from the SAFE-UP advisory board. The five Italian attendees were all researchers from UNIFI, while three of them did not have had direct involvement in the project.



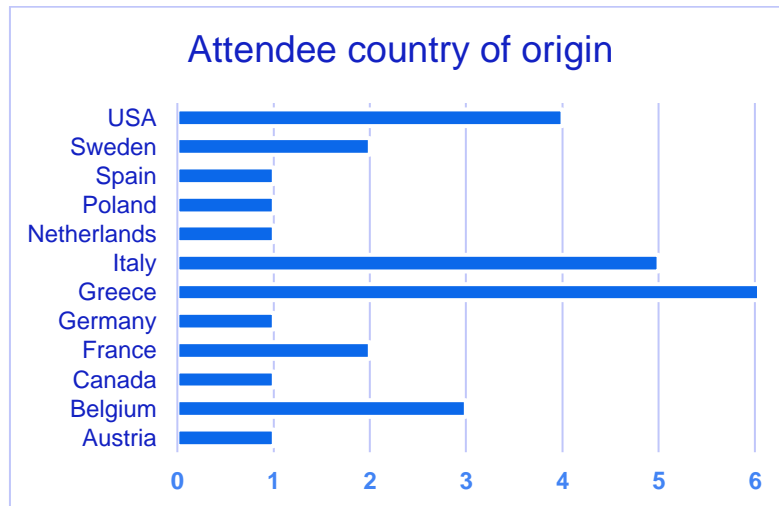


Figure 63: Attendee country of origin.

Attendees represented a range of different organizations across research, user clubs and federations, government, private sector and driver education (Figure 64).

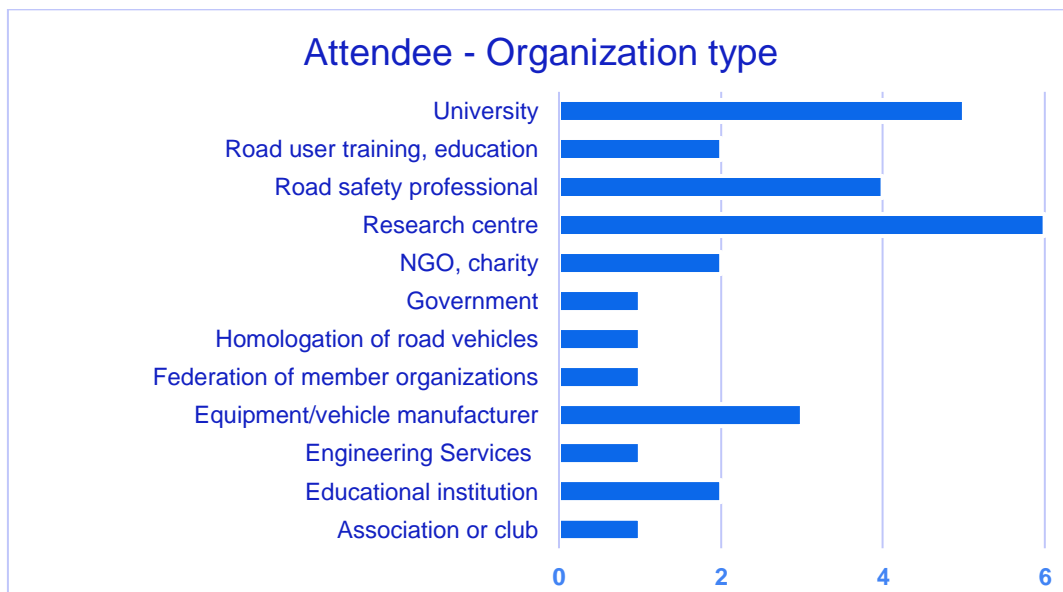


Figure 64: Organization type

Expertise represented also showed a good range across sectors and domains (Figure 65).



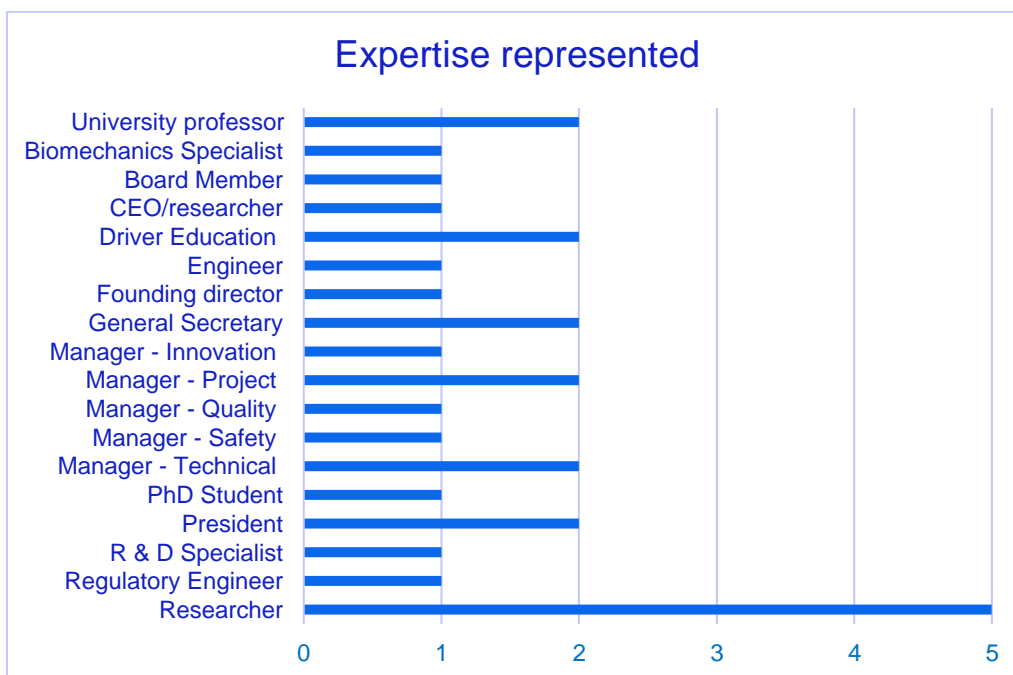


Figure 65: Expertise represented

Seven of the attendees, spanning research, rider education and non-profit sector volunteered expert feedback and discussion. Comments from an eight expert – a researcher from a French university who was unable to attend – are also included.

Overall, there was consensus that the course is very valuable and has great potential, not only for general knowledge/ general audiences but also for professionals in motorcycle safety research, education and user advocacy. Attendees agreed on the valuable collection of data, the advantages of the interactive discussion points and learning activities for group sharing and learning, and the fundamental value of Unit 4’s crash analyses case studies for learning valuable hazard perception, anticipation and cognitive safety strategies skills. It was pointed out that this unit would be particularly effective in combination with group discussion among riders of different experience levels, as long as this could be curated by instructors to guide towards the appropriate conclusions about safety behaviour and interacting as a ‘road user community’ for everyone’s safety. The course was seen to take a big step towards making crash research knowledge available and accessible to the public.

The greatest weakness agreed on by all was the sheer volume of information, often with too many pieces on each slide. It was suggested that the course be divided up in terms of level of complexity and refined to more effectively target different audiences (e.g. end road user vs. road safety professional, novice vs. experienced road users). There was concern that the potential information overwhelm could have the negative effect of turning a user off from going through the whole course.

A summary of the main points, including critique and suggestions for improvement or further development is provided in Table 11: Responses from the Workshop.



Table 11: Responses from the Workshop

| Aspect critiqued | Suggestions for improvement |
|--|---|
| Content | |
| <ul style="list-style-type: none"> • Unclear who the target audience was – too broad. • Level of technical detail is mixed – seems to address multiple types of users. • Lots of technical terms and specific expressions e.g. ‘perceptual-cognitive failures’. • Too much on the page. • Massive amount of information requiring much time and concentration. | <ul style="list-style-type: none"> • Split content into two parts: one for general users, one for professionals, those seeking more technical detail and complexity • Have a navigation system than allows users to choose the level of complexity / pathway they wish to follow • maybe focus on one target group • Also split material for novice riders/drivers vs. those with more experience • For end users, limit scope, use simpler language • Spread over more slides • Reduce the amount of text • Divide into shorter chapters of 5 min each with a single message |
| <p>Comments</p> <ul style="list-style-type: none"> • very interesting collection of data and information, valuable for researchers like themselves • big potential – some good things, but some question marks • great collection of data <p><i>“There was nothing in content that I didn’t know or was surprising – that’s a good thing so compliments”.</i></p> <p><i>“If developed as an app for smart phone so people could sit for 5-10 minutes and click through some of the activities and info that would have the biggest benefit – as a next step.”</i></p> <p><i>“I would expect a regular rider, who is also a target group would collapse in front of that mass of information – lots of technical terms and specific expressions”</i></p> | |
| Usability, accessibility & presentation | |
| <ul style="list-style-type: none"> • As an older person: not all the boxes were easy to read due to the colours used, lack of contrast, and small font in some cases. • Not all the people use PowerPoint... what about “free” software like LibreOffice Impress. • The slide are in English, what about other languages? If only in English not useful... | <p>This was just the first version, the intention was to translate into multiple EU languages, however, perhaps this is not the right stage for translation which should be done after the program is refined.</p> |



Comments: *"I really like the information boxes, especially with very short text and pictures beside"*

Content – regional relevance & data gaps

- | | |
|---|---|
| <ul style="list-style-type: none"> • Missing crash data between motorcyclists and cyclists or pedestrians – these happen a lot in the Netherlands – important gap. • Crash data is too regionally limited. • Crash data is old (MAIDS) - many changes since, especially a lot of new distractors (phones). • Misses recent psychology and ergonomic research on the causes of failures. • Miss some proposals i.e. to improve the perception of speed of PTWs, improve PTW visibility by adding lights. • References are mainly Anglo-Saxon - missing research from other cultures. | <ul style="list-style-type: none"> • Translate into other languages to improve benefit. • Reference a broader literature source to reflect regional diversity (data) and inclusive review of available scholarship. |
|---|---|

Comments: *"To base the work on German statistics is by definition limited and oriented... as stated in previous slides the socio-cultural characteristics is quite important in the behaviours!"*

Interactive aspects – discussion points and exercises

Comments:

"Wow this is great to do in a group....or 2 riders together"

*"Going through in a group of people familiar w/ mc safety research there – was almost fun to go through and check own knowledge against the collection of data in the course...the **discussion points and exercises** were fun to do together".*



3.3.4 Drivers and bicyclists course

This course was evaluated by 7 users. The areas of expertise of the respondents are the following:

- Bicycle Safety.
- Research on vehicle safety and vehicle-user interaction (incl. VRU), including autonomous vehicles. Development of training material and tools for road safety addressing all user groups.
- Education, Research on micro mobility-related risks and alcohol impairment.
- Vehicle Dynamics.
- HMI, elderly, VRUs, etc.
- Accident Prevention in Transportation and Mining using advanced technologies (driving and heavy machinery simulators, software, roll over cars and seat belt convincers, trainings, audits, research and development).
- Drivers training for people with disabilities.

The organization of the experts varies, having one respondent from NGO, one OEM, one Research Centre, one from Federation, two from Universities and one from other non defined (Figure 66).



Figure 66: Which best describes your organisation.

Regarding the primary activities that are aligned with road user safety, the respondents declared the following:

- Information provider / knowledge hub, Advocacy for road users, Policy development
- Safety promotion, risk reduction, Safety research & testing, Technology innovation, Translation, mobilisation, dissemination of research results, Safety initiatives, campaigns, public outreach, Policy development, Road transport design or management, Education and training



- Safety research & testing, Translation, mobilisation, dissemination of research results, Education and training
- Safety research & testing, Technology innovation, Safety initiatives, campaigns, public outreach, Education and training
- Safety promotion, risk reduction, Safety research & testing, Technology innovation, Information provider / knowledge hub, Translation, mobilisation, dissemination of research results, Safety initiatives, campaigns, public outreach, Road transport design or management, Education and training
- Safety promotion, risk reduction, Safety research & testing, Technology innovation, Translation, mobilisation, dissemination of research results, Safety initiatives, campaigns, public outreach, Advocacy for road users, Road transport design or management, Education and training
- Education and training

Regarding the question if the content addresses identified needs for road user knowledge and skills the majority of the users agree (Figure 67). According to the comments of the users the course covers identified needs related to safety needs for passengers and drivers and in fact it does it in a neglected field of road safety, which mostly focuses on drivers. Additionally, respondents declare that the content is sufficient, but the connection to SAFE UP is not clear (i.e., AVs).

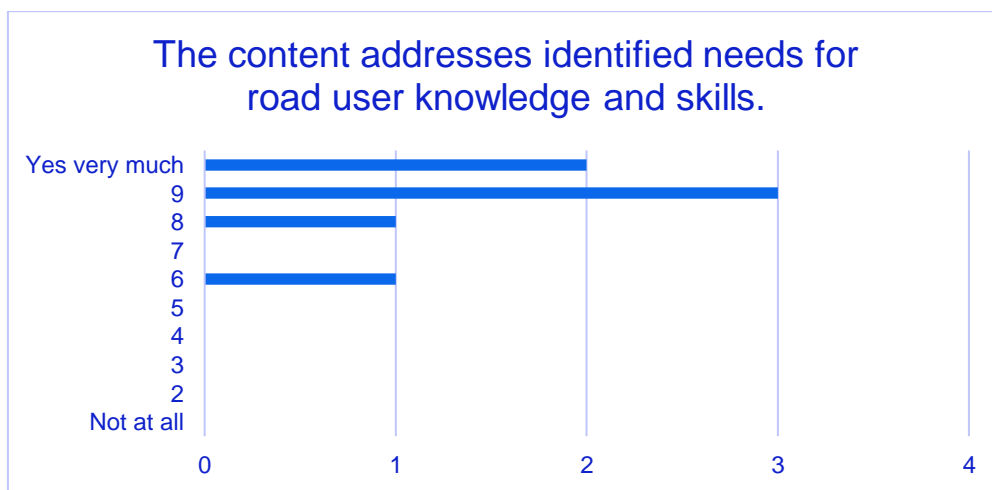


Figure 67: The content addresses identified needs for road user knowledge and skills.

Regarding the question, if the course addresses recognized gaps in road user training and safety awareness, the majority of the experts were very positive. Only one user thinks that the course does not addresses recognized gaps in road user training and safety awareness (Figure 68).



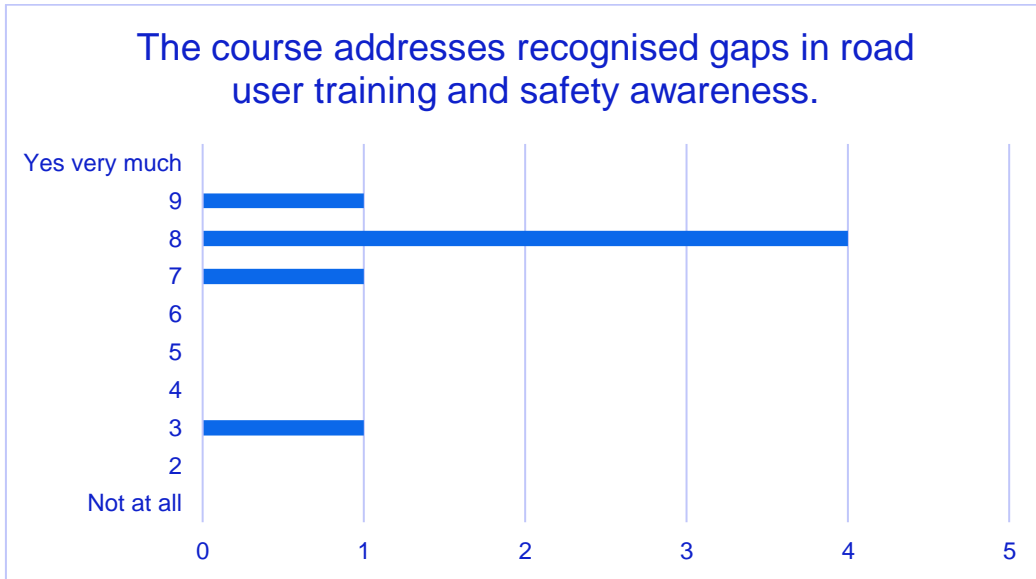


Figure 68: The course addresses recognised gaps in road user training and safety awareness.

Regarding the question if the approach reflects evidence-based recommendations for driver training and/or safety awareness programs, the majority of the experts were positive, providing comments such as “Yes, there are links to knowledge developed by highly-respected institutions and organizations.”, “Some results are presented in text and video form.” (Figure 69).

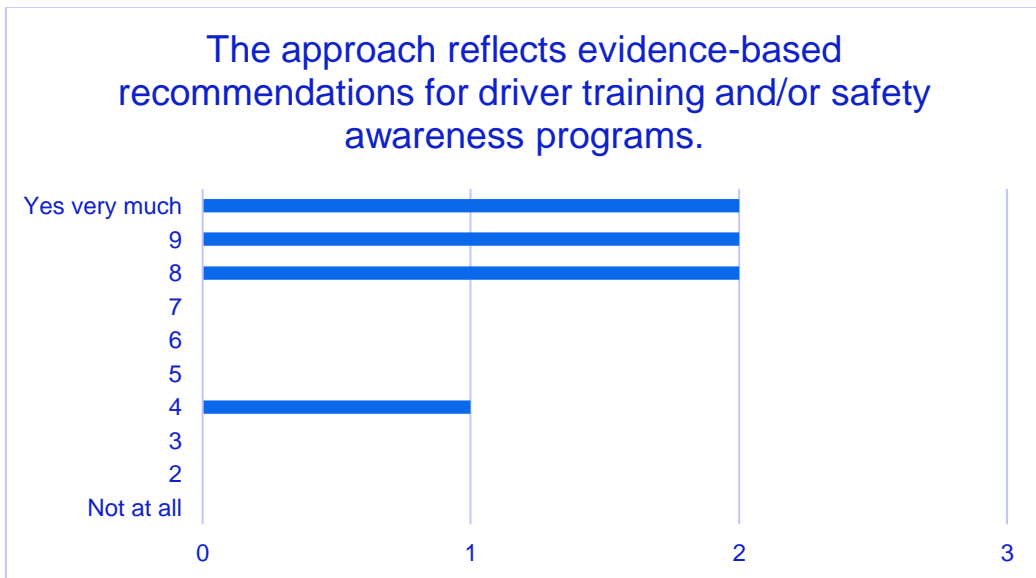


Figure 69: The approach reflects evidence-based recommendations for driver training and/or safety awareness programs.

Regarding the question if the course has the potential to contribute to improved safety for unprotected road users (pedestrians or cyclists), the majority of the experts were very positive, providing comments such as “Yes. For the time being the set of threats that cyclists face is not well documented and many cyclists ignore them”, “Yes, it does, examples could



help”. Only one user thinks that the course does not have the potential to contribute to improved safety for unprotected road users (pedestrians or cyclists) (Figure 70).

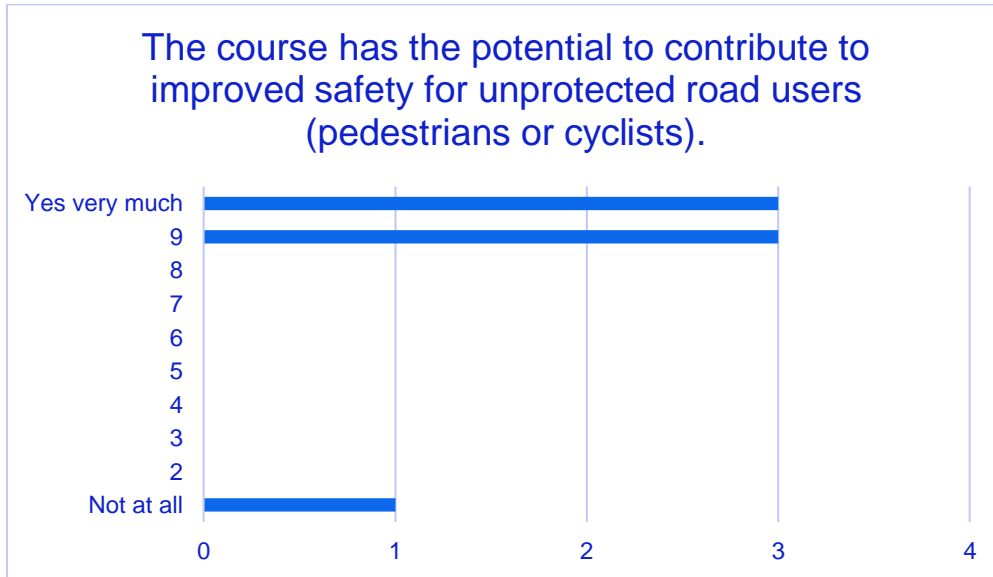


Figure 70: The course has the potential to contribute to improved safety for unprotected road users (pedestrians or cyclists).

Regarding the question if the course has relevance for target audiences beyond individual road users, the majority of the experts were very positive, providing comments such as “Yes, cyclist federations should be made aware of the course and urged to disseminate among users and stakeholders.”, “Yes, but the connection with AVs is missing”. Only one user thinks that the course does not have the potential to contribute to improved safety for unprotected road users (pedestrians or cyclists) (Figure 71).

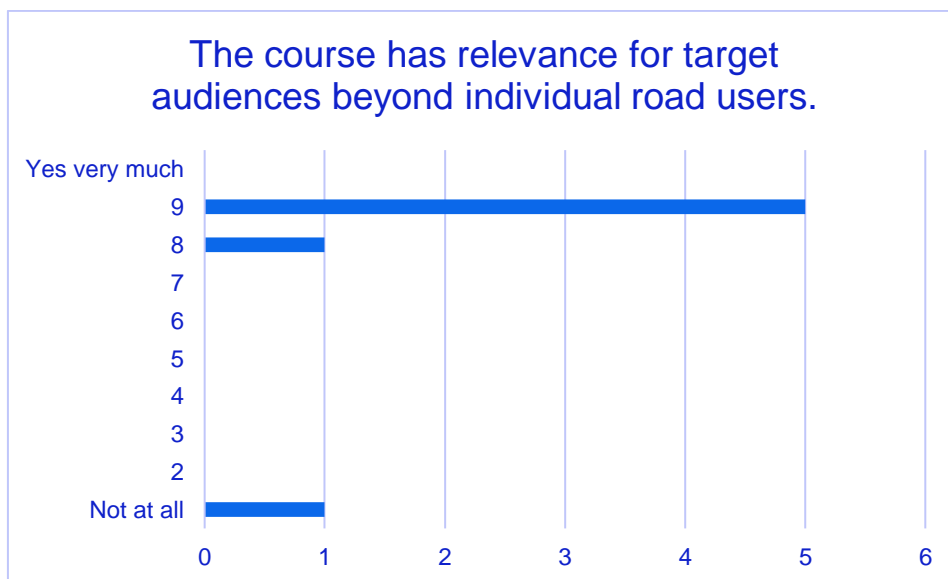


Figure 71: The course has relevance for target audiences beyond individual road users.



Regarding the question if the course provides missing and / or new information, the majority of the experts were positive, providing comments such as “Yes, regarding the movement of cyclists and their interaction with other road users.”, “I am not sure information is new, but is useful.” Only one user thinks that the course does not provides missing and / or new information. (Figure 72).

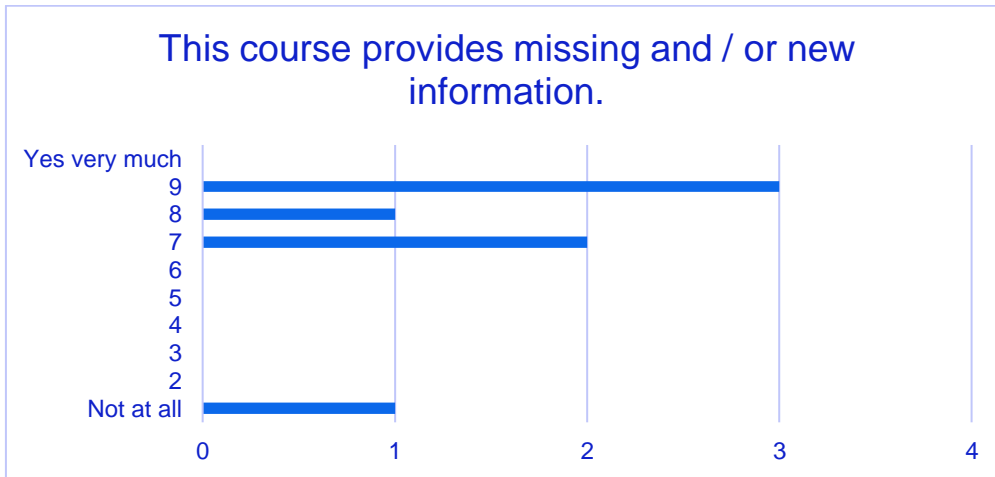


Figure 72 This course provides missing and / or new information.

Regarding the question if the course should be shared and implemented, the majority of the experts were very positive, providing comments such as “Yes, it should be shared and implemented as a way to reduce incidents that involve cyclists, which usually are quite severe.”, “Definitely with a few improvements, e.g. text size and placement (text boxes should be larger and text boundaries).”. Only one user thinks that the course does not believe that this course should be shared not implemented. (Figure 73).

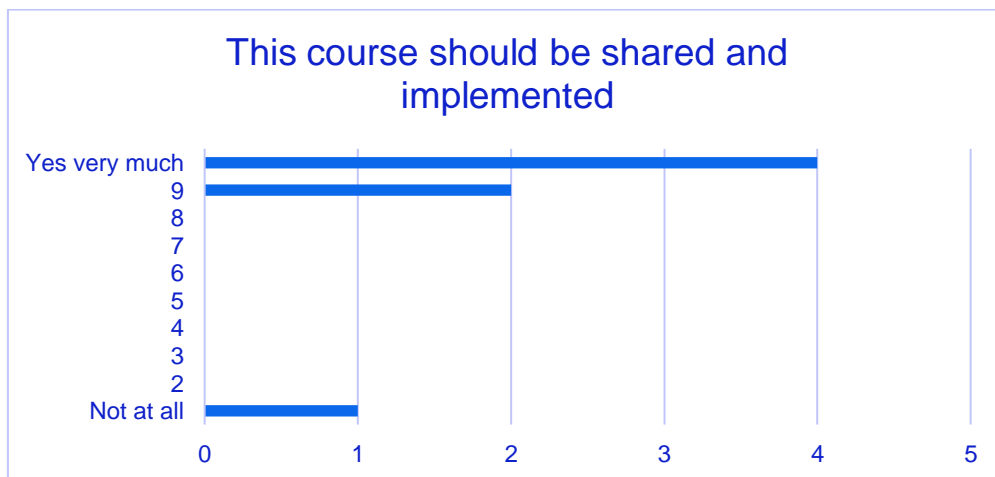


Figure 73: This course should be shared and implemented



Regarding the question if the course stimulates new research or policy questions/directions, the majority of the experts were very positive. Only one respondent does not think that the course stimulates new research or policy questions/directions (Figure 74).



Figure 74: This course stimulates new research or policy questions/directions.

Regarding the question who needs this course there were various answers. Most respondents believe that school boards, educators, driving schools and driving instructors need the course, as well as special interest groups. Next, the respondents believe that the new and pre-licensees as well as road transport and safety professionals need the course. The respondents believe that the stakeholders who need this course the less is the private sector and industry (Figure 75).



Who needs this course?

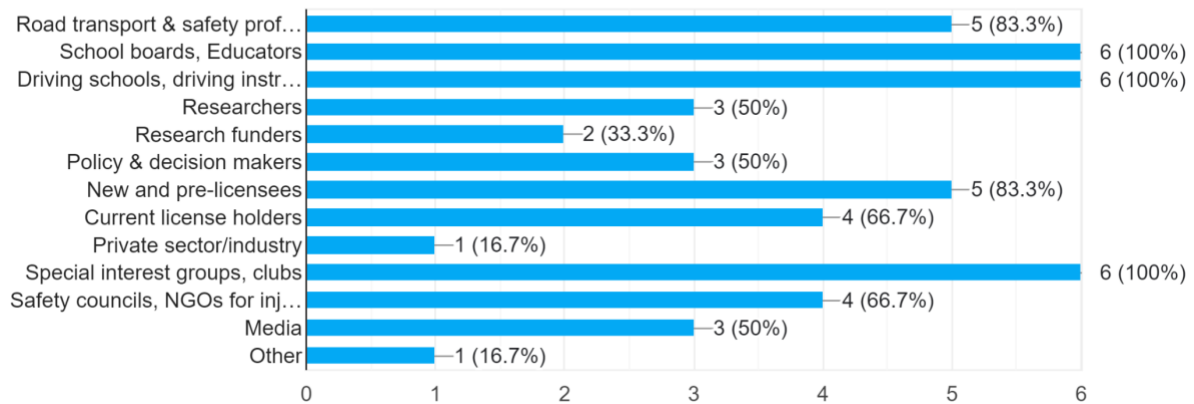


Figure 75: Who needs this course

Regarding the questions about what in this course works well, there were various answers from the respondents.

- Use of videos.
- Inclusive information about cyclist safety with nice visualisations and useful examples.
- Brevity, clarity and innovative approach.
- Layout, pictures, etc.
- Graphics.

Regarding the questions about what in this course needs in terms of improvement and / or further development, there were various answers from the respondents.

- Perhaps additional discussion about local regulations regarding cycling could be used.
- Perhaps to include micro mobility modes.
- Text size, placement, relation to SAFE-UP and AVs.

From the aforementioned results, we see that the majority of the respondents are satisfied with the course. Nevertheless, there was one respondent that was not satisfied. One of the main concerns of this respondent was that this course is not designed to teach, but to sell technology that is unlikely to be common in the next decade and that will degrade both quality of life and equity. However, it is important to clarify that the training course is not designed to sell specific technologies, but rather to educate and raise awareness about road safety and also SAFE-UP project which is not a selling product, but an ongoing research. Our goal is to promote safer road behaviour and create a more inclusive and equitable road environment. While technology advancements are mentioned, since it is a training course that wants to promote also SAFE-UP project, they are not the central focus of the course.



3.3.5 SAFE-UP demos course

This course was evaluated by 6 users. The areas of expertise of the respondents are the following:

- Research on vehicle safety and vehicle-user interaction (incl. VRU), including autonomous vehicles. Development of training material and tools for road safety addressing all user groups.
- Education, Research on micromobility-related risks and alcohol impairment.
- Vehicle Dynamics.
- HMI, elderly, VRUs, etc.
- Accident Prevention in Transportation and Mining using advanced technologies (driving and heavy machinery simulators, software, roll over cars and seat belt convincers, trainings, audits, research and development).
- Drivers training for people with disabilities.

The organization of the experts varies, having one respondent from NGO, one OEM, one Research Centre, one from Federation and two from Universities (Figure 76).



Figure 76: Which best describes your organisation.

Regarding the primary activities that are aligned with road user safety, the respondents declared the following

- Information provider / knowledge hub, Advocacy for road users, Policy development
- Safety promotion, risk reduction, Safety research & testing, Technology innovation, Translation, mobilisation, dissemination of research results, Safety initiatives, campaigns, public outreach, Policy development, Road transport design or management, Education and training



- Safety research & testing, Translation, mobilisation, dissemination of research results, Education and training
- Safety research & testing, Technology innovation, Safety initiatives, campaigns, public outreach, Education and training
- Safety promotion, risk reduction, Safety research & testing, Technology innovation, Information provider / knowledge hub, Translation, mobilisation, dissemination of research results, Safety initiatives, campaigns, public outreach, Road transport design or management, Education and training
- Safety promotion, risk reduction, Safety research & testing, Technology innovation, Translation, mobilisation, dissemination of research results, Safety initiatives, campaigns, public outreach, Advocacy for road users, Road transport design or management, Education and training
- Education and training

Regarding the question if the content addresses identified needs for road user knowledge and skills all users agree (Figure 77).

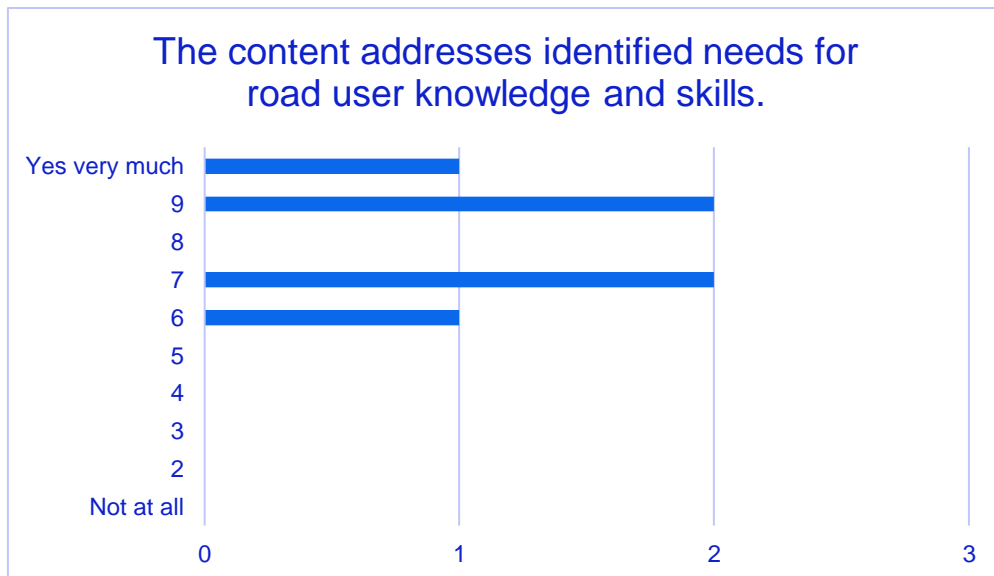


Figure 77: The content addresses identified needs for road user knowledge and skills.

Regarding the question, if the course addresses recognized gaps in road user training and safety awareness, the majority of the experts were positive (Figure 78).



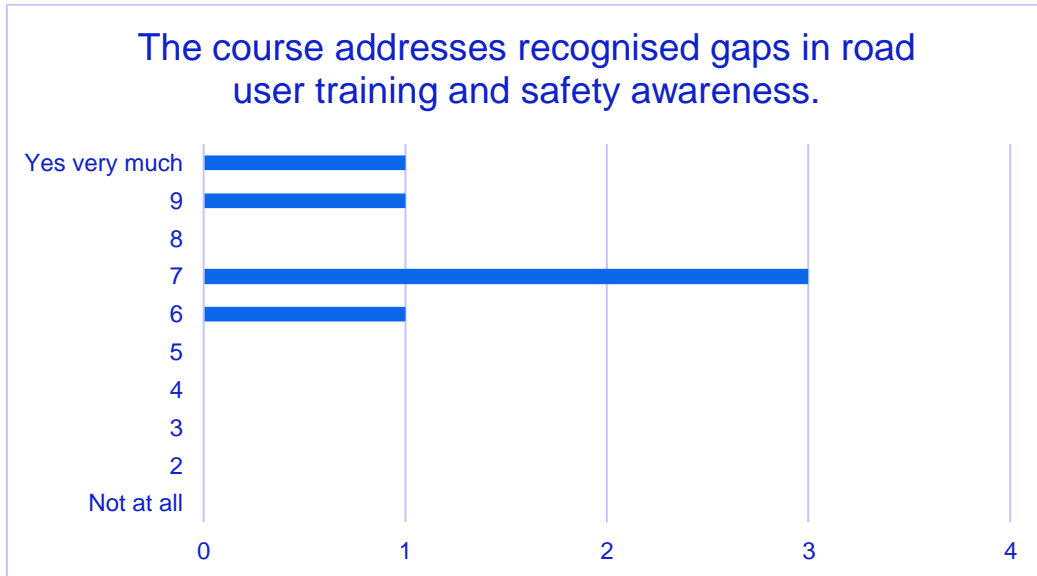


Figure 78: The course addresses recognised gaps in road user training and safety awareness.

Regarding the question if the approach reflects evidence-based recommendations for driver training and/or safety awareness programs, the majority of the experts were neutral to positive (Figure 79).

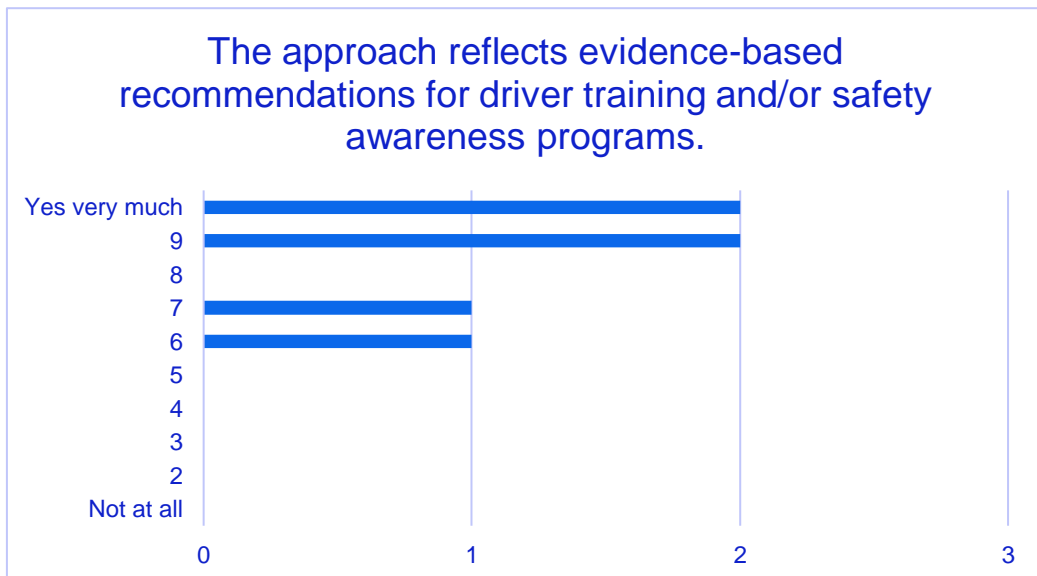


Figure 79: The approach reflects evidence-based recommendations for driver training and/or safety awareness programs.

Regarding the question if the course has the potential to contribute to improved safety for unprotected road users (pedestrians or cyclists), the majority of the experts were positive (Figure 80).



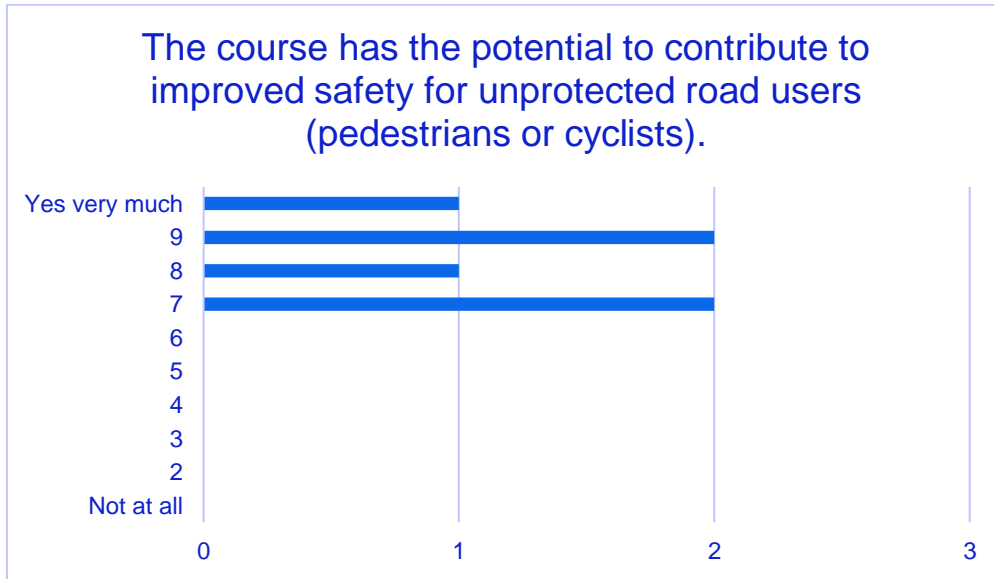


Figure 80: The course has the potential to contribute to improved safety for unprotected road users (pedestrians or cyclists).

Regarding the question if the course has relevance for target audiences beyond individual road users, the majority of the experts were very positive (Figure 81).

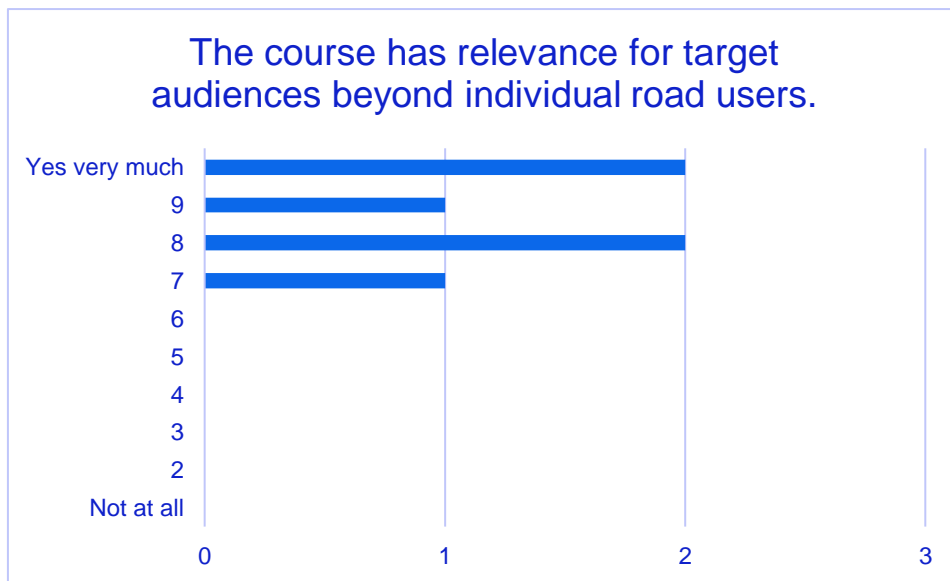


Figure 81: The course has relevance for target audiences beyond individual road users.

Regarding the question if the course provides missing and / or new information, all experts were very positive (Figure 82).



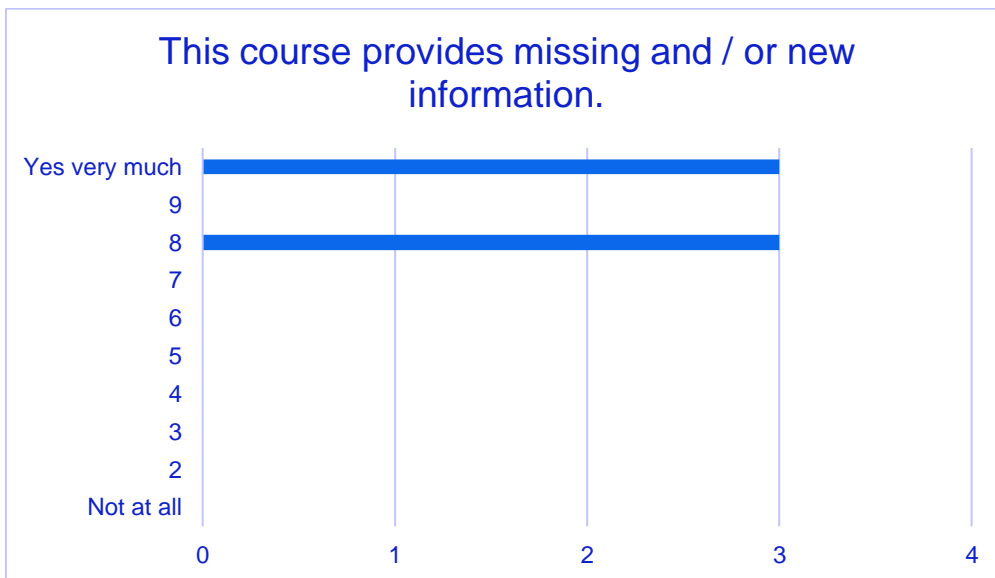


Figure 82 This course provides missing and / or new information.

Regarding the question if the course should be shared and implemented, all experts were very positive (Figure 83).

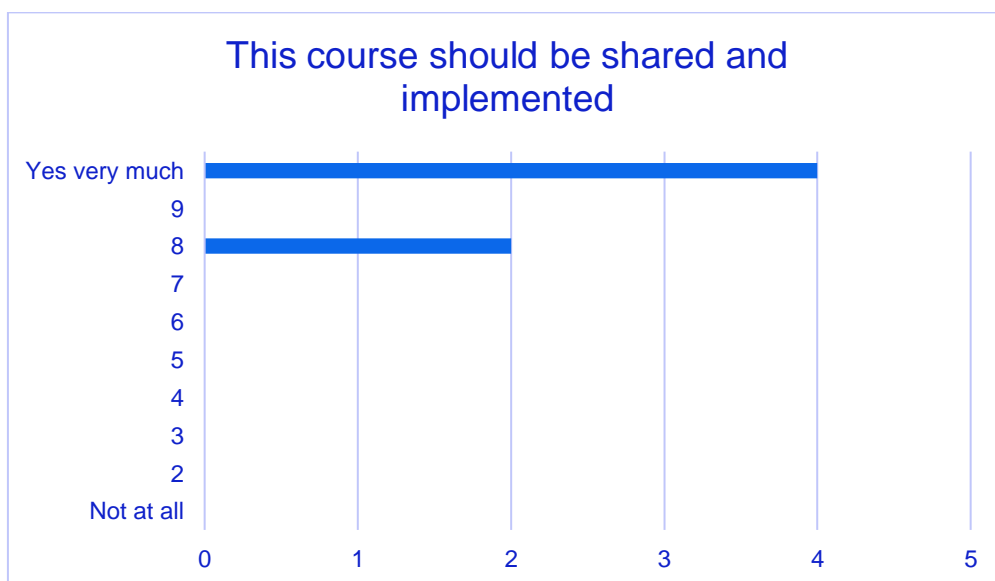


Figure 83: This course should be shared and implemented

Regarding the question if the course stimulates new research or policy questions/directions, the majority of the experts were very positive (Figure 84).





Figure 84: This course stimulates new research or policy questions/directions.

Regarding the question who needs this course there were various answers. Most respondents believe that the transport experts and researchers need the course at the most. Next, the respondents believe that the research funders need the course (Figure 85).

Who needs this course?

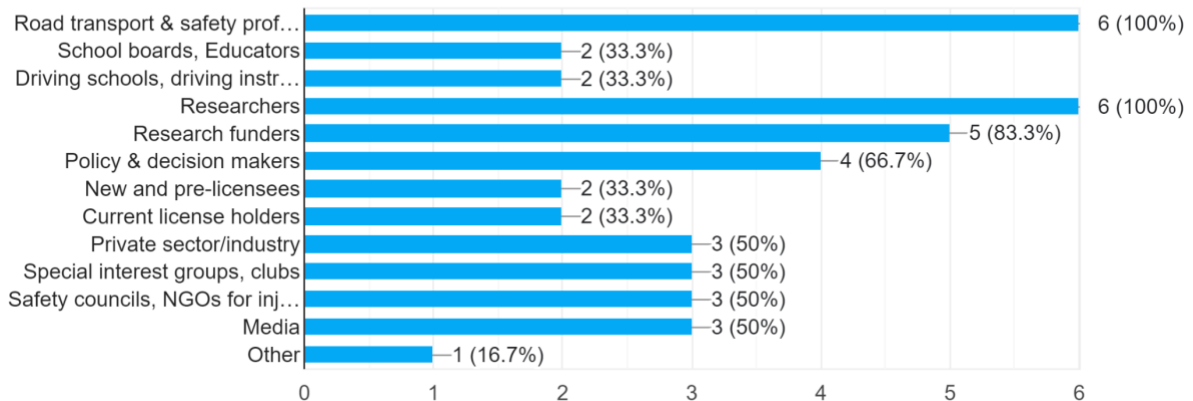


Figure 85: Who needs this course

Regarding the questions about what in this course works well, there were various answers from the respondents.

- Interesting demos on SoA applications, well presented in videos
- It is a targeted and integrated approach.
- SoA for AVs in one place.
- It provides the drivers with new, unknown so far, information



Regarding the questions about what in this course this course needs in terms of improvement and / or further development, there were various answers from the respondents.

- It is rather technical; not appropriate as such for the broad public
- Perhaps to accompany the course with more audio visual material so that the users could better understand these novel concepts.
- Reflect of how this SoA is different from the US and other countries, e.g. comparison with number and placement of sensors are different in US and Europe.
- It will need regular update based on the evolvement of automation technology.

3.3.6 Introduction to automation course

This course was evaluated by 6 users. The areas of expertise of the respondents are the following:

- Research on vehicle safety and vehicle-user interaction (incl. VRU), including autonomous vehicles. Development of training material and tools for road safety addressing all user groups.
- Education, Research on micro mobility-related risks and alcohol impairment.
- Vehicle Dynamics.
- HMI, elderly, VRUs, etc.
- Accident Prevention in Transportation and Mining using advanced technologies (driving and heavy machinery simulators, software, roll over cars and seat belt convincers, trainings, audits, research and development).
- Drivers training for people with disabilities.

The organization of the experts varies, having one respondent from NGO, one OEM, one Research Centre, one from Federation and two from Universities (Figure 86).



Figure 86: Which best describes your organisation.

Regarding the primary activities that are aligned with road user safety, the respondents declared the following



- Information provider / knowledge hub, Advocacy for road users, Policy development
- Safety promotion, risk reduction, Safety research & testing, Technology innovation, Translation, mobilisation, dissemination of research results, Safety initiatives, campaigns, public outreach, Policy development, Road transport design or management, Education and training
- Safety research & testing, Translation, mobilisation, dissemination of research results, Education and training
- Safety research & testing, Technology innovation, Safety initiatives, campaigns, public outreach, Education and training
- Safety promotion, risk reduction, Safety research & testing, Technology innovation, Information provider / knowledge hub, Translation, mobilisation, dissemination of research results, Safety initiatives, campaigns, public outreach, Road transport design or management, Education and training
- Safety promotion, risk reduction, Safety research & testing, Technology innovation, Translation, mobilisation, dissemination of research results, Safety initiatives, campaigns, public outreach, Advocacy for road users, Road transport design or management, Education and training
- Education and training

Regarding the question if the content addresses identified needs for road user knowledge and skills all respondents agree (Figure 87).

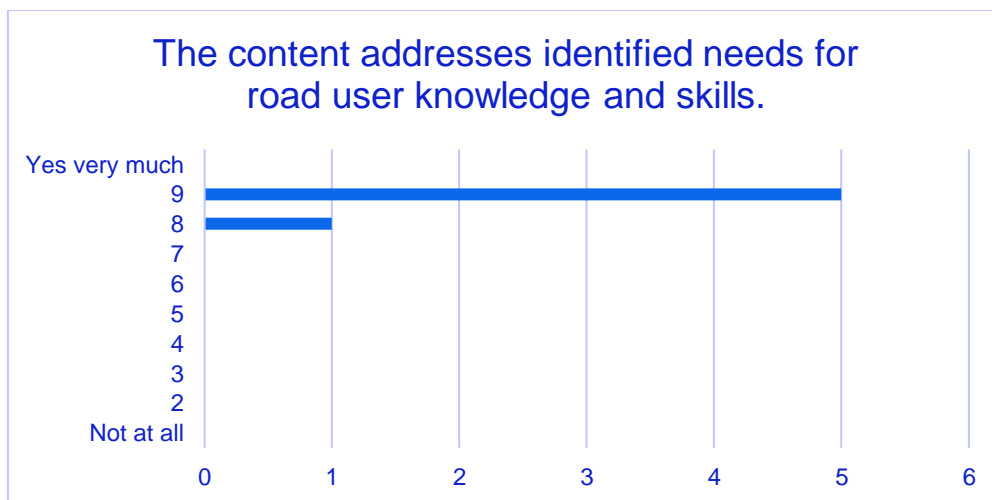


Figure 87: The content addresses identified needs for road user knowledge and skills.

Regarding the question, if the course addresses recognized gaps in road user training and safety awareness, all experts were positive, providing comments such as “Yes, the course targets important gaps about the use of autonomous vehicles” (Figure 88).



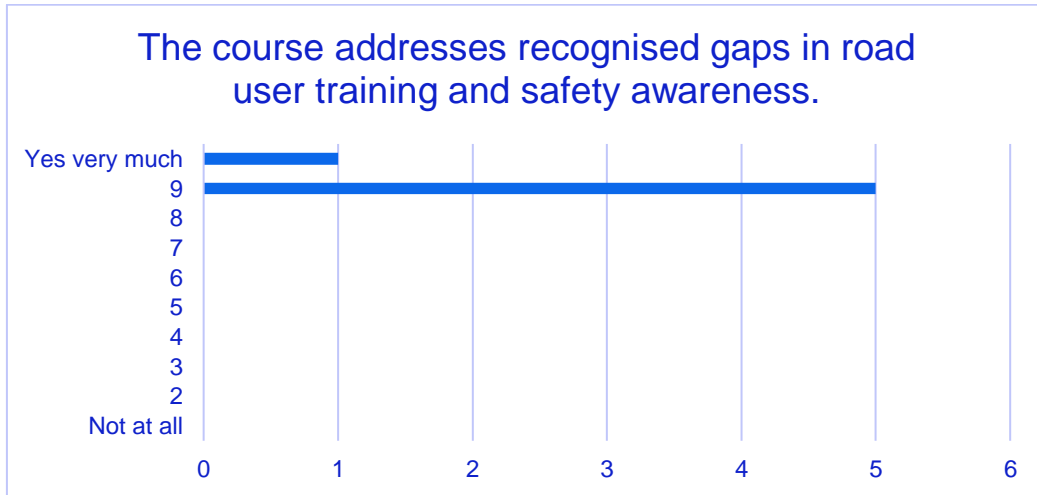


Figure 88: The course addresses recognised gaps in road user training and safety awareness.

Regarding the question if the approach reflects evidence-based recommendations for driver training and/or safety awareness programs, all experts were positive, providing comments such as “Yes, there is reference to NHTSA.” (Figure 89).

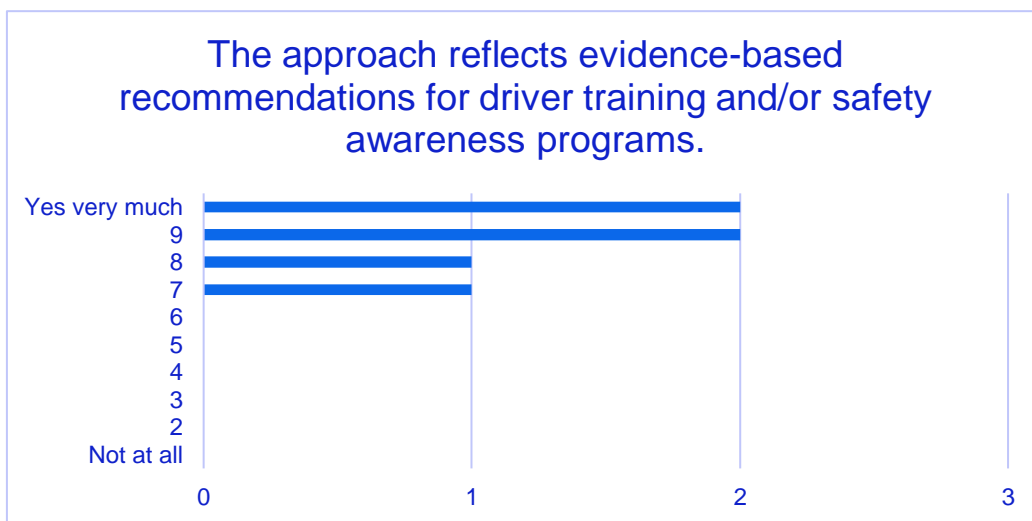


Figure 89: The approach reflects evidence-based recommendations for driver training and/or safety awareness programs.

Regarding the question if the course has the potential to contribute to improved safety for unprotected road users (pedestrians or cyclists), the majority of the experts were very positive, providing comments such as “Yes, the course points out the safety concerns faced by unprotected road users because of autonomous cars” (Figure 90).



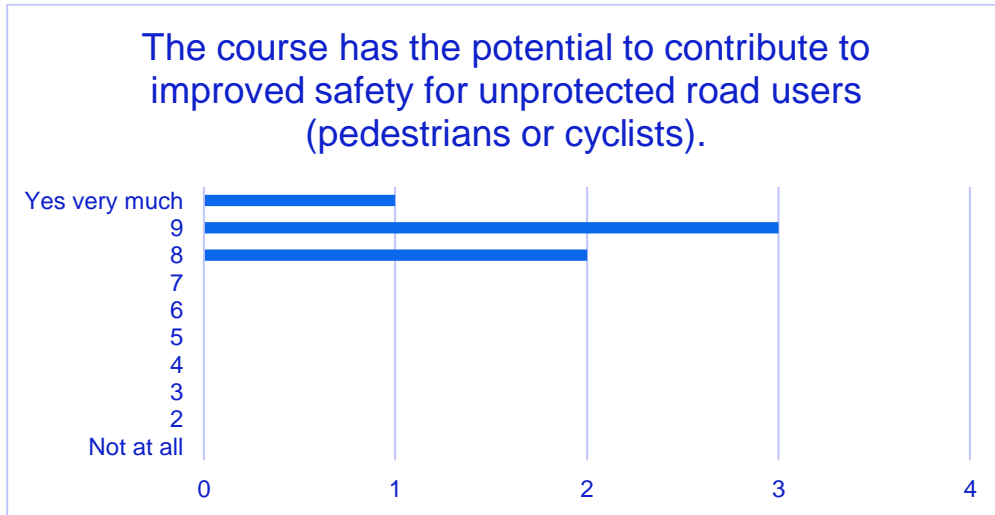


Figure 90: The course has the potential to contribute to improved safety for unprotected road users (pedestrians or cyclists).

Regarding the question if the course has relevance for target audiences beyond individual road users, all experts were very positive, providing comments such as “Certainly. There is a widespread need for many audiences to adjust to the new reality of autonomous driving and the course offers the incentive.” (Figure 91).

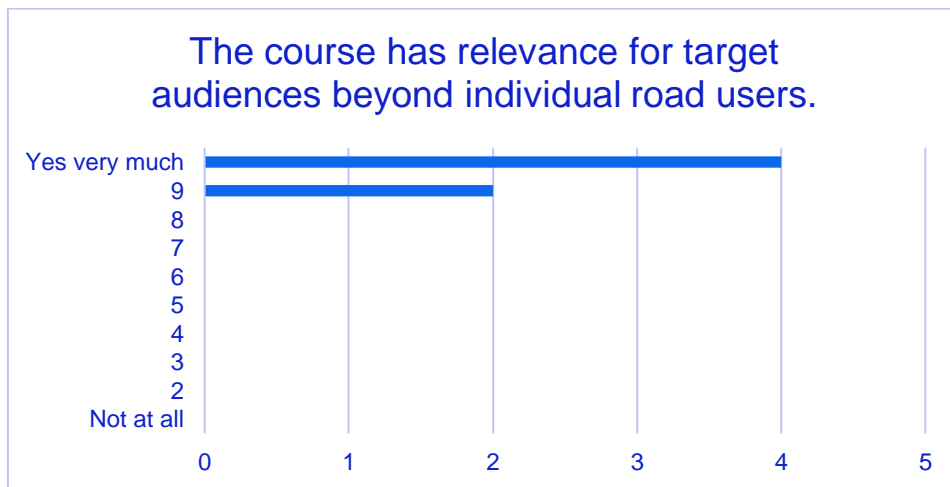


Figure 91: The course has relevance for target audiences beyond individual road users.

Regarding the question if the course provides missing and / or new information, all experts were very positive. (Figure 48).



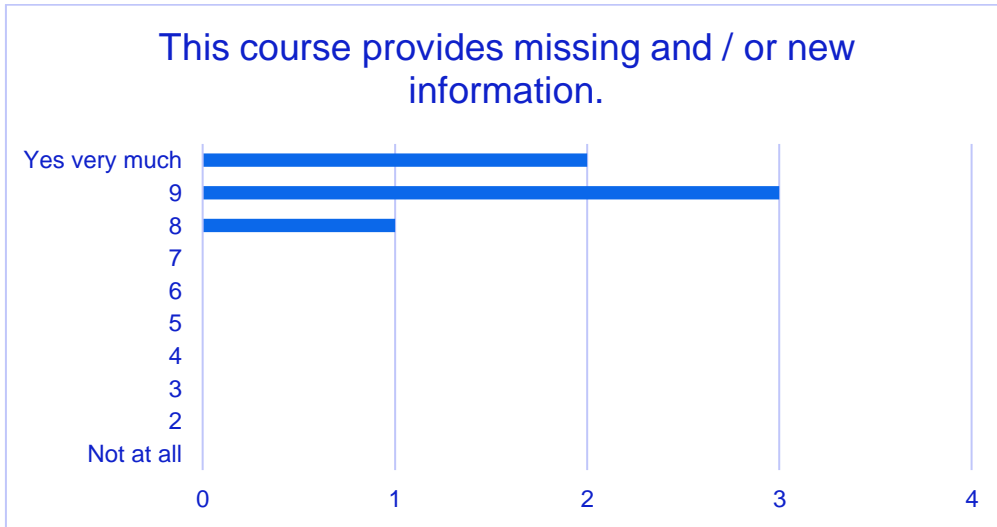


Figure 92 This course provides missing and / or new information.

Regarding the question if the course should be shared and implemented, all experts were very positive (Figure 93).

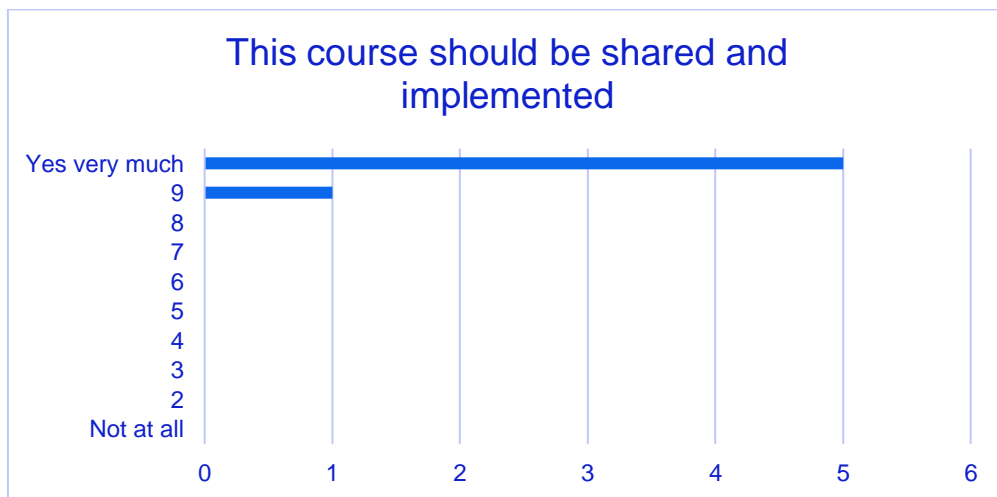


Figure 93: This course should be shared and implemented

Regarding the question if the course stimulates new research or policy questions/directions, the majority of the experts were very positive, providing comments such as “Yes. As stated above, it is important to kick-off the discussion for the coexistence of autonomous vehicles and other road users, as to outline the needs for training of all road users.” (Figure 94).



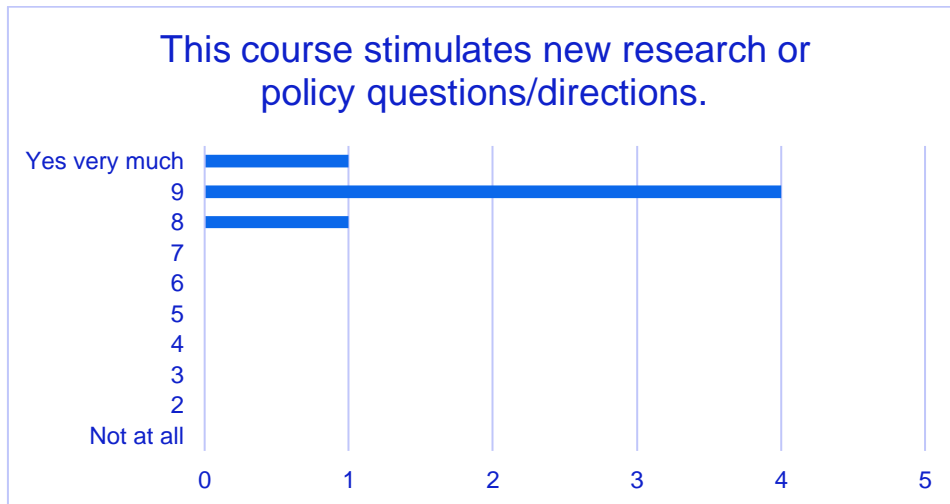


Figure 94: This course stimulates new research or policy questions/directions.

Regarding the question who needs this course there were various answers. Most respondents believe that the Road transport & safety professionals, Driving schools, driving instructors, Researchers, Policy & decision makers, New and pre-licensees, Current license holders, and Special interest groups need this course at the most (Figure 95).

Who needs this course?

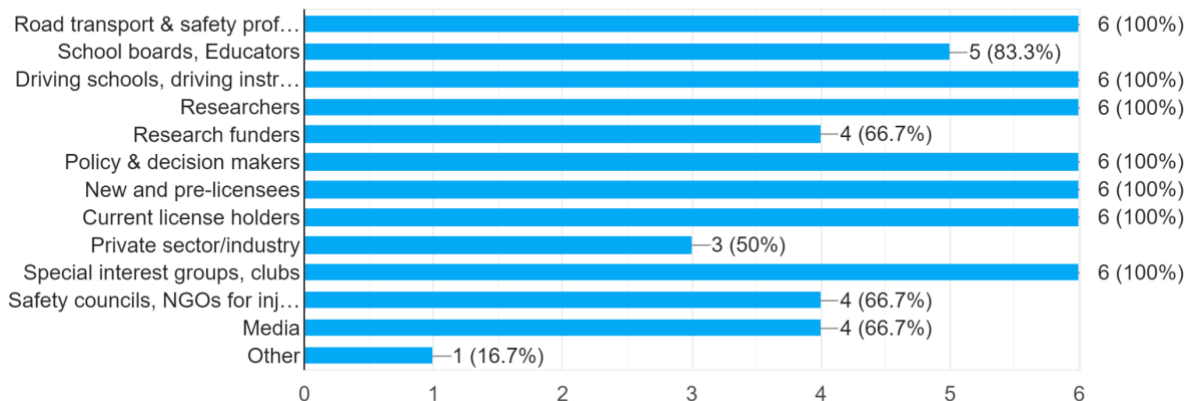


Figure 95: Who needs this course

Regarding the questions about what in this course works well, there were various answers from the respondents.

- Interesting content on a topic that is "yet to come" in everyday practice. Nice and pleasant presentation in an understanding manner
- Innovative approach; presentation of information.



Regarding the questions about what in this course this course needs in terms of improvement and / or further development, there were various answers from the respondents.

- Highlight the challenges of autonomous cars
- More details on autonomous vehicles future issues and hazards

3.4 Evaluation outcomes in a nutshell

The table below shows a summary of the highlights, the lowlights and the comments of the evaluation with both general audience and experts and provides actions to tackle them.



Table 12: Evaluation results in a nutshell and actions towards tackling them within SAFE-UP

| Course | Highlights | Lowlights | Comments/ Concerns | Actions |
|---|--|---|---|--|
| 1. Drivers' and pedestrians' safety on the road | <ul style="list-style-type: none"> • Interactive elements • Examples • Simulation videos • Knowledge provision | <ul style="list-style-type: none"> • Lack of Adaptability to country specific elements • Lack of realistic environment at simulation videos | <ul style="list-style-type: none"> • Addresses subtypes of pedestrians (i.e. children, elderly, people with disabilities) • Avoid victim blaming • Make target groups (operators of dangerous devices, decision makers) aware of the "diversity" of users outside the vehicles | <ul style="list-style-type: none"> • To tackle the lack of adaptability <ul style="list-style-type: none"> ○ Within the project: translation to other languages ○ Future research: to include non EU countries data. • To tackle the lack of realistic simulation environment <ul style="list-style-type: none"> ○ Within the project: Fix possible errors and inform viewers that this is just an overview of an event. The conditions are not realistic. ○ Future research: to include more realistic simulation environment • To addresses subtypes of pedestrians <ul style="list-style-type: none"> ○ Within the project: not possible since this was not supported by SAFE-UP outcomes. ○ Future research: to include subtypes of pedestrians like children, elderly, people with disabilities • To avoid victim blaming <ul style="list-style-type: none"> ○ Within the project: create courses that combine user types (i.e. pedestrians with drivers) ○ Future research: to enhance Safe System Approach • To make target groups aware of the "diversity" of users outside the vehicles <ul style="list-style-type: none"> ○ Within the project: create courses that involve multiple user types (i.e. pedestrians, drivers, PTW riders, bicyclists) ○ Future research: to create awareness material for policy makers and operators. |
| 2. SafeRiders | <ul style="list-style-type: none"> • Well-structured and good collection of data for the experienced rider. | <ul style="list-style-type: none"> • Needs better structure on the slides. • Not very accessible and | <ul style="list-style-type: none"> • The analyses of past crashes (MAIDS is old) is interesting but not sufficient. | <ul style="list-style-type: none"> • To tackle the needs to have better structure. <ul style="list-style-type: none"> ○ Within the project: Divide into shorter chapters of 5 min each with a single message. ○ Future research: create specific modules for specific learning objectives. |



| Course | Highlights | Lowlights | Comments/ Concerns | Actions |
|--------|--|--|---|---|
| | <ul style="list-style-type: none"> Nice graphics. Provides material for excellent brainstorming. | <p>usable in terms of format.</p> <ul style="list-style-type: none"> Too complicated with too much information. To technical language. | <ul style="list-style-type: none"> The socio cultural aspects are poorly taken into account. The content misses crashes between motorcycles and bicycles or pedestrians. The academic world frequently states that training [programs] have no effect on rider safety. The course does not provide any new knowledge. | <ul style="list-style-type: none"> To tackle the lack of accessible and usable in terms of format: <ul style="list-style-type: none"> Within the project: Split content into two parts: one for general users, one for professionals, those seeking more technical detail and complexity Future research: use professional eLearning tools To addresses that the course is too complicated with too much information <ul style="list-style-type: none"> Within the project: Split content for novice riders/drivers vs. those with more experience Future research: Same as above, but taking it into account from the beginning of the course development. . To addresses that the course's language is too technical. <ul style="list-style-type: none"> Within the project: limit scope, use simpler language Future research: Use simple language To addresses that content misses crashes between motorcycles and bicycles or pedestrians <ul style="list-style-type: none"> Within the project: Not possible, out of SAFE-UP scope. Future research: Include crashes between motorcycles and bicycles or pedestrians. To addresses that academic world frequently states that training [programs] have no effect on rider safety <ul style="list-style-type: none"> Within the project: Not possible, out of SAFE-UP scope. Future research: Concentrate on Safety System Approach. To addresses that the course does not provide any new knowledge <ul style="list-style-type: none"> Within the project: More than new knowledge, the course provides new ways to communicate and teach based on up-to-date knowledge. |



| Course | Highlights | Lowlights | Comments/ Concerns | Actions |
|--|--|--|---|---|
| | | | | <ul style="list-style-type: none"> ○ Future research: Concentrate on Safety System Approach. |
| 3. Drivers' and bicyclists' safety on the road | <ul style="list-style-type: none"> • Documents well all the dangers of a bicyclists. • Interactive elements • Graphics • Videos • Knowledge provision | <ul style="list-style-type: none"> • Does not provide any new. unknown information • Does not include micro mobility modes | <ul style="list-style-type: none"> • The content is sufficient, but the connection to SAFE UP is not clear | <ul style="list-style-type: none"> • To addresses that the course does not provide any new knowledge <ul style="list-style-type: none"> ○ Within the project: More than new knowledge, the course provides new ways to communicate and teach based on up-to-date knowledge. ○ Future research: Concentrate on Safety System Approach. • To addresses that the course does not include micro mobility modes <ul style="list-style-type: none"> ○ Within the project: Not possible, out of SAFE-UP scope. ○ Future research: Include micro mobility modes • To addresses that the content is sufficient, but the connection to SAFE UP is not clear <ul style="list-style-type: none"> ○ Within the project: Create a sections with SAFE-UP demos, since Demo 4 is closely related to bicycle users. ○ Future research: N/A |
| 4. Getting to know SAFEUP's Demos | <ul style="list-style-type: none"> • New, unknown to the driver information • Representation | <ul style="list-style-type: none"> • To technical language • Few audio visual material in comparison to the other courses | <ul style="list-style-type: none"> • It will need regular update based on the evolvement of technology | <ul style="list-style-type: none"> • To addresses that the course's language is too technical. <ul style="list-style-type: none"> ○ Within the project: Use simpler language when possible and make sure that it is evident that the course incudes technical information. ○ Future research: Use simple language • To addresses that limitation in the amount of visual material. <ul style="list-style-type: none"> ○ Within the project: Add videos where possible. ○ Future research: Use multiple interactive elements and multimedia. • To addresses that regular update based on the evolvement of technology will be needed. |



| Course | Highlights | Lowlights | Comments/Concerns | Actions |
|---|---|---|--|--|
| | | | | <ul style="list-style-type: none"> ○ Within the project: Not possible since SAFE-UP is finishing and there will be no update of the technologies within its duration. ○ Future research: Create future calls that will allow the content to be regularly updated. |
| 5. Automated vehicles today and in the future | <ul style="list-style-type: none"> • New, unknown to the driver information • Representation. | <ul style="list-style-type: none"> • To technical language • More details on autonomous vehicles future issues and hazards. | <ul style="list-style-type: none"> • It will need regular update based on the evolvement of automation technology | <ul style="list-style-type: none"> • To addresses that the course's language is too technical. <ul style="list-style-type: none"> ○ Within the project: Use simpler language when possible and make sure that it is evident that the course includes technical information. ○ Future research: Use simple language • To addresses that more details on autonomous vehicles future issues and hazards could be added. <ul style="list-style-type: none"> ○ Within the project: create a section with specific next steps. ○ Future research: Have details on autonomous vehicles future issues and hazards studied and presented in more detail. • To addresses that regular update based on the evolvement of technology will be needed. <ul style="list-style-type: none"> ○ Within the project: Not possible since SAFE-UP is finishing and there will be no update of the technologies within its duration. ○ Future research: Create future calls that will allow the content to be regularly updated. |



3.5 Before and after analysis of SAFE-UP training video

In addition to the aforementioned training courses, a short video was created and it was presented to the Consortium at the SAFE-UP Final meeting at IDIADA’s premises. The evaluation of the video was realized on the spot. There were 30 respondents that cover exactly the number requested from the GA.

The GA participants answered a set of before questions, they watched the video, and after watching the video they answered the same questions again. The results are presented below.

At the question “As a driver, how would you rate your knowledge of road safety now”, before watching the video, 46,7% rate is a good, 43,3% as very good and only 6,7% as medium and 3,3% as bad. After watching the video, the percentage slightly changed, with some more people (46,7 % instead of 43,3% that was “before”) believe that have very good knowledge of the road safety as drivers (Figure 96).

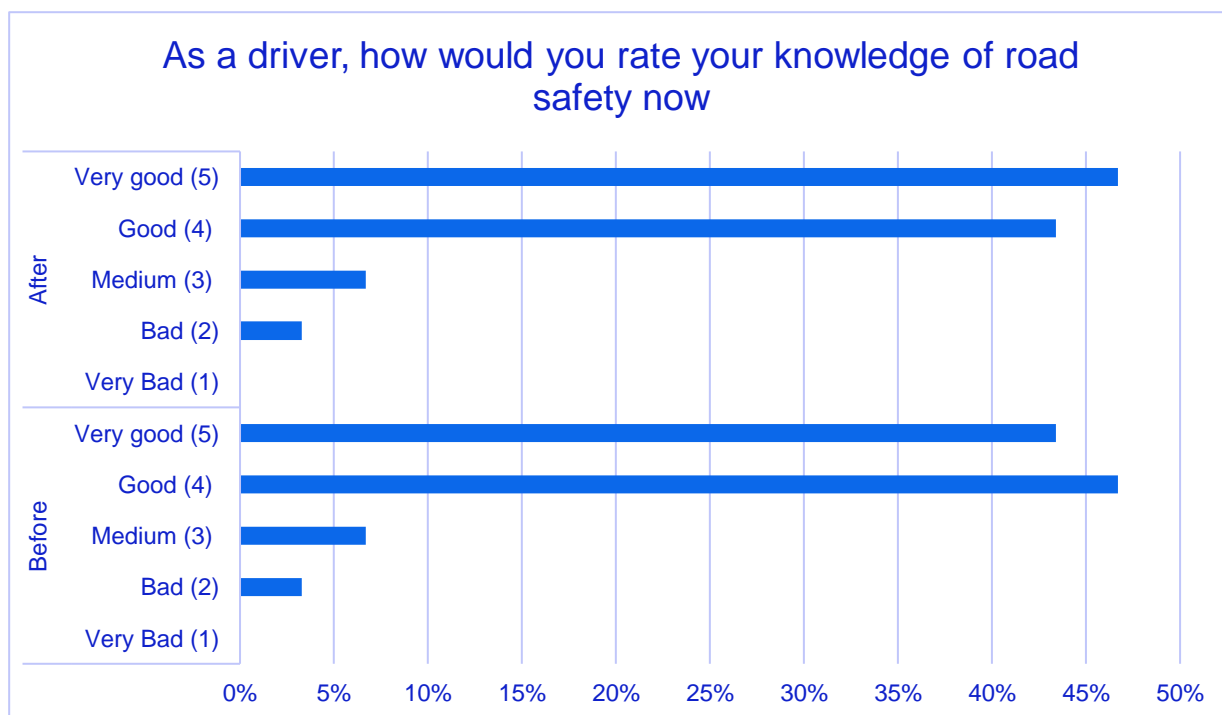


Figure 96: As a driver, how would you rate your knowledge of road safety now (before and after)

At the question “As a pedestrian, how would you rate your knowledge of road safety now”, before watching the video, 46,7% rate is a very good, 40% as good and only 13,3% as medium. After watching the video, the percentage slightly changed, with some more people (53,3 % instead of 46,7% that was “before”) believe that have very good knowledge of the road safety as pedestrians (Figure 97).



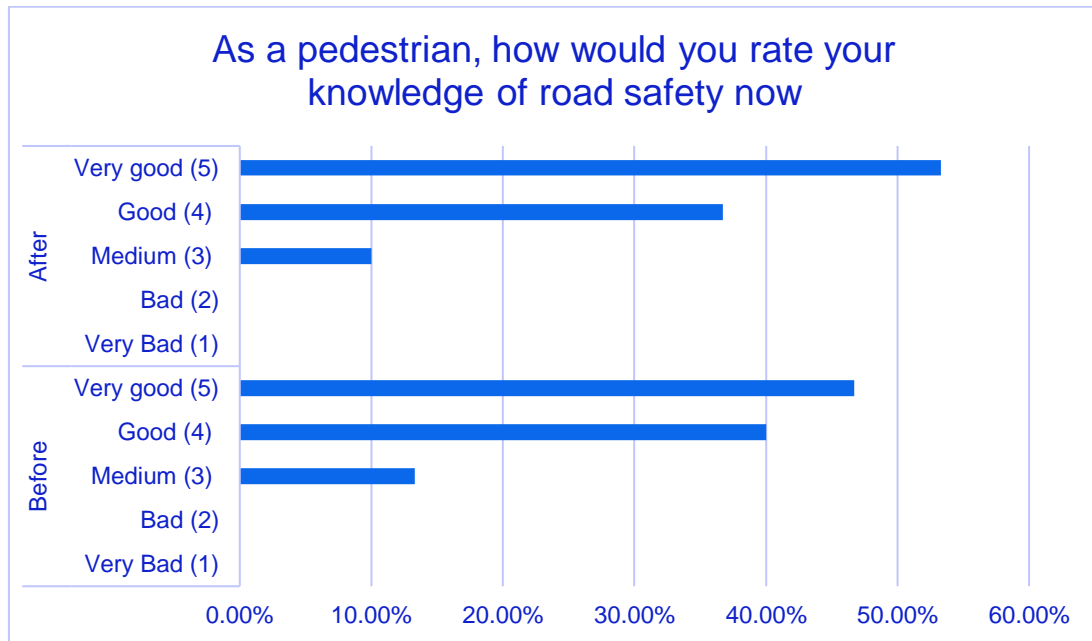


Figure 97: As a driver, how would you rate your knowledge of road safety now (before and after)

At the question “Do you feel confident in your knowledge of road safety rules and practices”, that was asked before watching the video, 83,3% answered yes, 13,3% were not sure and only 3,4% answered no. So the participants already had, or at least believe they had, very good knowledge of road safety rules and practices ().

Do you feel confident in your knowledge of road safety rules and practices?

30 responses

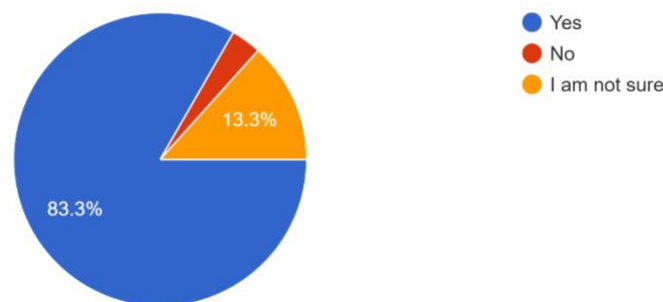


Figure 98: Do you feel confident in your knowledge of road safety rules and practices.

After watching the video the participants were asked if they feel more confident in their knowledge of road safety rules and practices, and 60% said that they did (Figure 99).



Do you feel more confident in your ability to avoid road accidents and hazards?
30 responses

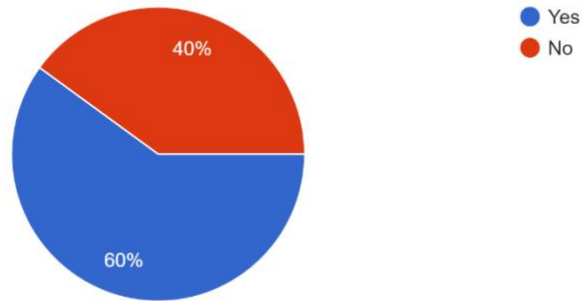


Figure 99: Do you feel more confident in your knowledge of road safety rules and practices.



4 Discussion on results, challenges, recommendations and future research

4.1 Challenges of the evaluation

The evaluation of the SAFE-UP Training, education and awareness materials presented certain challenges, but efforts were made to mitigate them and gather valuable feedback. The evaluation took place towards the end of the project and primarily involved Consortium members, both those directly involved in the project and those without direct involvement. Additionally, experts from the Key Safety Network were invited to participate in the evaluation process.

One of the main challenges faced was the language barrier, as the courses were conducted in English, which may not have been the native language of many respondents. Despite this, strategies were implemented to encourage participation and gather feedback. Consortium members were invited to take part in the evaluation as general users, in alignment with the project's requirements. By including members from the Consortium, the evaluation process could proceed without the need for external participants who might have required reimbursement that was not available.

Although these strategies allowed for a relatively high number of 94 respondents from the general public and 36 experts, it is important to acknowledge that the results may not be fully comprehensive. The limited scope of participants may have impacted the diversity and inclusivity of the evaluation. However, the feedback received from these participants and the external experts still provides valuable insights and informs the ongoing improvement of the Training, education and awareness materials.

Despite the budgetary constraints and other challenges, the evaluation process demonstrates the commitment to continuous improvement and the willingness to gather feedback from stakeholders. It serves as a stepping stone for future evaluations, highlighting the importance of expanding the participant pool and incorporating a wider range of perspectives. By learning from these challenges and refining evaluation strategies, future assessments can strive for greater inclusivity, comprehensive results, and ultimately contribute to the overall effectiveness and impact of the SAFE-UP eLearning Training, education and awareness materials.

4.2 Discussions on the results

The evaluation of the eLearning course has yielded encouraging results, highlighting its effectiveness in promoting safer road behaviours and SAFE-UP results. One notable achievement is the course's ability to present the perspectives of all road users. This inclusive



approach ensures that learners gain a balanced understanding of the challenges and responsibilities faced by drivers, pedestrians, and other road users.

The courses foster empathy and encourage a collaborative mind-set among learners. All courses emphasize the shared responsibility of all road users in creating a safer and more harmonious road environment. This approach is instrumental in promoting understanding and respect between different user groups, ultimately contributing to a more cooperative and considerate road culture. This inclusive approach within the courses' materials also helps to create a non-judgmental learning environment. Instead of focusing on individual faults or shortcomings, the course directs attention towards systemic factors. Furthermore, the course's emphasis on empathy and collaboration empowers learners to develop a broader perspective on road safety. By recognizing and appreciating the experiences and concerns of various road users, learners are more likely to adopt responsible behaviours and make informed decisions on the road. This shift in mind-set not only improves individual road safety but also contributes to a positive societal change in attitudes towards road use and interaction.

Furthermore, the evaluation underscores the importance of targeting both drivers and decision-makers as the primary audience for the e-learning course. By educating drivers, the course seeks to enhance their understanding of the risks associated with certain behaviours and the potential consequences for all road users. The evaluation also emphasizes the importance of adhering to speed limits, maintaining focus and alertness, and respecting the rights of pedestrians and vulnerable road users, which is something that the course is also taking into account. Moreover, it encourages drivers to critically assess their own driving habits and make conscious efforts to improve their skills and attitudes towards road safety.

Simultaneously, the evaluations suggest to engage decision-makers. The course at the moment does not target those users per se, but it aims to influence policies and initiatives that contribute to safer road environments. In future research specific material should be prepared for policy makers that highlight the need for infrastructure improvements, effective traffic management, and the integration of sustainable safety principles into urban planning. By targeting decision-makers, the Safety System approach will be applied and will enable to foster a proactive approach to road safety, ensuring that it becomes a priority in policy discussions and resource allocation.

The evaluation also highlights the importance of communication and accurate representation in the course materials. By striving for authenticity and realism, the course can better engage learners and facilitate a deeper understanding of road safety challenges. By providing realistic and relatable scenarios, the course can effectively convey its message and engage participants. The ability to communicate road safety principles in a clear, concise, and engaging manner is crucial for the course's success in educating and influencing drivers and decision-makers.

The evaluation results for the "Drivers and pedestrians course" and the "Drivers and bicyclists course" among the general public were predominantly positive. However, it is worth noting that certain advocacy stakeholders expressed criticism regarding the training of pedestrians and the perceived lack of new information for cyclists. The pedestrian advocacy stakeholder raised concerns about prioritizing the Safe System Approach over training pedestrians. While



this perspective aligns with future research directions, it may not be feasible to solely rely on user behavior in the current system. It is important to strike a balance between individual responsibility and systemic improvements to enhance road safety. Similarly, the bicyclist advocacy stakeholders criticized the course for not providing new information. However, it is important to emphasize that the focus of the course goes beyond simply imparting new knowledge. It aims to enhance communication and teaching methodologies based on the latest insights and research. The course offers innovative ways to educate and raise awareness, complementing the existing knowledge base. It is important to note that these instances of negative feedback were isolated, and the overall response from participants and experts involved in the evaluation process was favorable. The positive feedback from the general public, particularly regarding the walking safety tips and cycling tips, underscores the course's effectiveness in addressing key concerns and promoting safe practices.

In general, the feedback received from both participants and experts provides valuable insights for further refining the courses and incorporating relevant updates. By addressing the specific concerns raised by advocacy stakeholders and continuously improving the course content and delivery, the SAFE-UP project can ensure that the courses remain relevant, impactful, and aligned with the evolving needs of road users.

Overall, the positive results of the evaluation underscore the course's achievements in promoting a balanced perspective, emphasizing diversity, targeting the right audience, and employing effective communication strategies. By building on these strengths and addressing any identified areas for improvement, the course can continue to make a valuable contribution to road safety education and ultimately enhance the overall quality of life for road users.

4.3 Recommendations and future actions

Based on the findings and the goal of promoting road safety, several recommendations and future actions have been proposed during the evaluation phase. These recommendations aim to enhance the training program and address identified gaps. By implementing these recommendations, either within the project or as baseline topics of future initiatives, we can strive towards creating a safer road environment and reducing accidents and injuries.

Below we present the recommendations retrieved from the evaluation and how we plan to cope them within the scope of SAFE-UP and beyond.



Table 13: Main lessons learned from the evaluation process, action with and after SAFE-UP

| Lessons learned | Actions within SAFE-UP | Future Actions |
|---|--|--|
| Use interactive elements and multimedia materials. | In SAFE-UP most of the courses have been firstly developed in CAPTIVATE and then they were added to Moodle. This provides a very well interactive process, as it was highlighted from evaluation results. | As in SAFE-UP, all the training courses should include interactive elements, to capture the attention of the learner. |
| Target the course towards drivers and decision makers, focusing on reducing speeds and promoting sustainable safety measures. | The course at the moment focuses on all the types of road users that were subjects of SAFE-UP projects. There should be future research to create specific material for decision and policy makers, which will also enhance the Safety System Approach. | To effectively target decision-makers and promote the importance of reducing speeds and implementing sustainable safety measures, future steps should involve engaging with key stakeholders, such as government officials and policy influencers, to raise awareness about the benefits of these initiatives and advocate for their implementation. Additionally, developing persuasive and evidence-based arguments that highlight the positive impacts of speed reduction and sustainable safety on public health, mobility, and overall quality of life can further support the course's objective and drive action among decision-makers. |
| Refrain from victim blaming. | SAFE-UP courses have been designed in a way so as to address diversity of road users including both the one in and outside of vehicles and raise awareness among drivers about the existence of diverse road users and encourage drivers to consider the safety of all road users. | Regarding the criticism of victim blaming, it is important to approach the topic with sensitivity. Recognizing that pedestrians may exhibit behaviours that are difficult to control or predict is crucial. Instead of placing blame on individuals, the focus should be on creating a safe system that considers the well-being of all road users, promoting the Safe System Approach. The responsibility lies with those in control of potentially lethal machines, infrastructure managers, and policymakers. |



| Lessons learned | Actions within SAFE-UP | Future Actions |
|---|--|--|
| Use simple language when you refer to general public. | SAFE-UP courses have been designed in a way to create awareness about the project outcomes, which, at their majority are technical. So we will make sure that the people who reach these are aware that technical terms might be included. | Work in multiple evaluation phases to make sure that the language used is understandable for general audience. Make sure to involve general audience (not only experts) to all the process of developing training materials. |
| Have clear and well structure content. | In most courses of SASE-UP this is a highlight. | Have clear and well structure content that would allow learners not to get frustrated. |
| Collaboration with Stakeholders | In SAFE-UP we introduced the Safety Partners Network from the very beginning of the project, until the very end (evaluation of the materials). | Foster collaboration with relevant stakeholders, such as local government authorities, traffic management agencies, and road safety organizations. Engage in ongoing dialogue to exchange knowledge, share experiences, and coordinate efforts in promoting road safety. Seek input and feedback from these stakeholders to enhance the training program and ensure alignment with local road safety strategies. |
| Tailoring Training to Specific Audiences | Within the scope of SAFE-UP we have create courses for a common adult pedestrian. Since the scope of the project was not to specify different groups nor their needs were capture anywhere else in the projects, there was not enough effort in this WP to do in depth research and create tailored made courses for all pedestrians' types. | Recognize the diverse needs and characteristics of road users. Develop tailored training modules for different target audiences, such as drivers, pedestrians, cyclists, and public transport users. Customize the content, delivery methods, and language to effectively engage and resonate with each group. This approach will maximize the impact of the training and address specific challenges faced by different road user categories. |



| Lessons learned | Actions within SAFE-UP | Future Actions |
|---------------------------|--|--|
| Integration of Technology | We understand that it is essential to ensure that the course materials accurately reflect real-world conditions to maintain credibility. We check the simulation videos and present the more realistic views possible, based on our research simulator capabilities. | Embrace the potential of technology in enhancing road safety training. Explore the integration of interactive simulations, virtual reality, and augmented reality tools to create immersive learning experiences. These technologies can simulate real-life road scenarios, allowing participants to practice decision-making in a safe and controlled environment. Additionally, leverage online platforms and mobile applications to provide accessible and convenient training resources. |
| Evaluation and Monitoring | In SAFE-UP we established an evaluation and monitoring framework to assess the effectiveness of the training program, identifying the limitation, constraints and challenges of it. | Establish an evaluation and monitoring framework to assess the effectiveness of the training program. Continuously measure key performance indicators, such as knowledge retention, attitude change, and observed behaviours. Regularly review evaluation data to identify areas of improvement and inform future iterations of the training program. |



5 Conclusions

Currently, the project is in a critical phase as we approach the finalization of various developments. Based on the outcomes of the technical work packages thus far, we have successfully conceptualized and developed a comprehensive set of training materials that address the technical aspects of SAFE-UP and facilitate effective training. In the content of WP6, five eLearning courses have been designed to promote road safety for all road users, utilizing the valuable materials provided by the other SAFE-UP work packages. While the primary objective of WP6 is not to generate new knowledge, it aims to educate, raise awareness, and provide training based on the knowledge acquired through the other technical work packages. Thus, the following eLearning courses have been conceptualized, developed and evaluated within WP6.

1. Drivers and pedestrians course
2. SafeRider's course
3. Drivers and bicyclists course
4. SAFE-UP demos course
5. Introduction to automation course

The content of the five eLearning courses has been unanimously approved by the experts within the SAFE-UP Consortium, and the majority of the external experts, as valid and reliable information. In addition to the Consortium approval, the courses have undergone feedback from both the general public and experts. The general public evaluation was conducted through an online survey, while the expert evaluation included participation in two workshops and completion of another online survey, resulting in a total of **96** evaluations from the general public and **33** evaluations from experts.

The evaluation process had a comprehensive scope, encompassing multiple objectives and goals. Firstly, it sought to determine whether the training program successfully achieved its intended outcomes, defined already in D6.1, ensuring that participants gained the necessary knowledge and skills related to road safety. This assessment was crucial in measuring the overall effectiveness and impact of the program.

Secondly, the evaluation aimed to identify areas within the training program that could be enhanced or refined. By gathering feedback from participants, stakeholders, and experts, valuable insights were gained regarding aspects of the program that may require adjustments or further development. This information was instrumental in ensuring continuous improvement and enhancing the overall quality of the training materials and delivery methods.

Thirdly, the evaluation process played a crucial role in providing feedback to stakeholders. By sharing the evaluation results, stakeholders were informed about the strengths and weaknesses of the training program. This feedback was vital in supporting decision-making processes, enabling stakeholders to make informed choices regarding the future direction and investment in the training program.



Moreover, the evaluation aimed to assess the training program's alignment with the needs of the target audience. By analysing the feedback from participants, their road safety concerns and requirements were taken into account. This ensured that the training program adequately addressed their specific needs and concerns, leading to increased relevance and engagement.

In conclusion, the evaluation process served as an assessment of the training program's achievements, areas for improvement, stakeholder feedback, decision-making support, and alignment with the target audience's road safety concerns. The insights gained from the evaluation process played a vital role in shaping the future of the training program and ensuring its ongoing effectiveness and relevance.

We carefully considered all the responses received, aiming to address as many areas of concern as possible within the project's timeline, allocated resources, and the scope and outcomes of SAFE-UP. It is important to acknowledge that these training courses cannot encompass all road safety topics. Our objective is to focus on the safety topics relevant to the SAFE-UP project, ensuring they are delivered with the utmost acceptability to the target audience.

The evaluation of SAFE-UP eLearning courses has resulted in a set of recommendations and guidelines that can be addressed both within the project duration and serve as a vision for future research. By incorporating these recommendations and taking proactive steps based on the evaluation findings, we have the opportunity to improve the effectiveness of the training program and make significant contributions towards the overarching objective of establishing a safer road environment. These recommendations provide valuable insights for refining the content, delivery methods, and overall approach of the training program, ensuring that it aligns with best practices and meets the evolving needs of road users. By implementing these recommendations and embracing a continuous improvement mind-set, we can pave the way for more effective and impactful road safety training initiatives in the future.

In conclusion, the evaluation has shed light on areas for improvement in the eLearning courses which have been updated and uploaded on the dedicated page at the SAFE-UP web site. Incorporating the insights and recommendations emerged from the evaluation process will ensure that the course effectively educates learners and contributes to the goal of creating safer roads for everyone.



6 References

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- [2] Nugent, M. N., et al. (2021). D6.1 Training, education and awareness needs for VRU/URU safety in evolving mixed automated traffic. Project: SAFE-UP, Horizon 2020 GA 861570. <http://safe-up.eu>
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- [4] Chalkia, E., et al. (2022). D6.4 Training material. Project: SAFE-UP, Horizon 2020 GA 861570. <http://safe-up.eu>
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7 Annex A: SAFE-UP training evaluation questionnaire – general public

1. Email Address:
2. Your city, country:
3. Gender Identity:
4. Age:
5. License information:
 - Learner license
 - B - car license
 - Do not have a car license but plan to get one
 - Do not have a car license and do not plan to get one
6. How many years have you held your car license?
7. Please rank the following mobility modes according to how often you use them to get around in urban areas.

| | Usually | Often | Sometimes | Rarely | Never |
|------------------------------------|---------|-------|-----------|--------|-------|
| Car | | | | | |
| Motorcycle or scooter | | | | | |
| Public transportation | | | | | |
| Bicycle | | | | | |
| Escooter | | | | | |
| Walking | | | | | |
| Wheelchair, other adapted mobility | | | | | |
| Other | | | | | |

8. Three words to describe your experience of this course are . . .



9. What did you like most about the course?
10. What did you like least about the course?
11. What was the most surprising thing you learned? Why?
12. What was the most useful thing you learned?
13. What was the least useful thing you learned?
14. What was missing, if anything?
15. Did the course cause you to change any of your beliefs or opinions? Please explain.
16. What, if anything, did you find particularly important for new or learner car drivers?
17. What will you do differently as a result of your learning?
18. How will you use what you learned?
19. Please rate your opinion of the following statements

| | strongly agree | agree | agree somewhat | disagree somewhat | disagree | strongly disagree |
|---|----------------|-------|----------------|-------------------|----------|-------------------|
| The language was too technical | | | | | | |
| The slideshows/learning modules were easy to use | | | | | | |
| The course was fun | | | | | | |
| I would recommend this course to friends and colleagues | | | | | | |
| The information was not a good match for my situation | | | | | | |
| People can use this information to improve their safety | | | | | | |
| I found the course confusing | | | | | | |



20. Do you have any other comments or suggestions on how the course could be improved?

8 Annex A: SAFE-UP training evaluation questionnaire – experts

I. Your personal information

1. Your name
2. City of residence/work
3. Country of residence/work
4. I am providing this evaluation as
 - An individual
 - A representative of a public, private or charitable organization

What is(are) your area(s) of interest and expertise regarding road user safety, particularly those outside of vehicles?

II. Information on your organisation

1. Name of organization
2. Which best describes your organization?
 - Government
 - Policy developer
 - Standards developer
 - NGO, charity
 - OEM
 - Public service entity
 - Research centre
 - University
 - Educational institution
 - Federation of member organizations
 - Association or club
 - Other



3. What is your role?
4. What are your organisation's primary activities that are aligned with road user safety?
 - Safety promotion, risk reduction
 - Safety research & testing
 - Crash research and epidemiology
 - Technology innovation
 - Information provider / knowledge hub
 - Translation, mobilisation, dissemination of research results
 - Safety initiatives, campaigns, public outreach
 - Advocacy for road users
 - Policy development
 - Standards development
 - Road transport design or management
 - Education and training

III. Please rate the course on the following 8 aspects. One is the lowest possible score, 10 is the highest. You may provide comments if you wish to elaborate.

1. *The content addresses identified needs for road user knowledge and skills.*
2. *The course addresses recognised gaps in road user training and safety awareness.*
3. *The approach reflects evidence-based recommendations for driver training and/or safety awareness programs.*
4. *The course has the potential to contribute to improved safety for unprotected road users (pedestrians or cyclists).*
5. *The course has relevance for target audiences beyond individual road users.*
6. *This course provides missing and / or new information.*
7. *This course should be shared and implemented*
8. *This course stimulates new research or policy questions/directions.*
9. *Who needs this course?*
 - Road transport & safety professionals
 - School boards, Educators
 - Driving schools, driving instructors
 - Researchers
 - Research funders
 - Policy & decision makers



- New and pre-licensees
- Current license holders
- Private sector/industry
- Special interest groups, clubs
- Safety councils, NGOs for injury prevention
- Media
- Other

10. *What about this course works well?*

11. *What about this course needs improvement and / or further development?*



9 Annex C: SAFE-UP before and after questionnaire

Before

1. As a driver, how would you rate your knowledge of road safety aspects now on a scale of 1 to 5?
2. As a pedestrian, how would you rate your knowledge of road safety aspects now on a scale of 1 to 5?
3. Do you feel confident in your knowledge of road safety rules and practices?
4. How often do you encounter road safety situations in your daily life (even if you are not involved at them)?

After

1. As a driver, how would you rate your knowledge of road safety aspects now on a scale of 1 to 5?
2. As a pedestrian, how would you rate your knowledge of road safety aspects now on a scale of 1 to 5?
3. Do you feel more confident in your knowledge of road safety rules and practices?

