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# Cyber in Practice

Erasmus+ KA2 - KA220-HED - Cooperation partnerships in higher education  
2021-1-TR01-KA220-HED-000031993

## R3/A3

# PILOT-TESTING RESULTS IN PARTNER COUNTRIES



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## PILOT-TESTING RESULTS IN TURKEY

### Introduction

This document is intended to reflect and disseminate the results regarding the Turkish pilot test. It presents the procedures followed, the results obtained, and the recommendations extracted from the feedback questionnaire standardized for this purpose. In order to facilitate further comparison between different participating countries, the same questionnaire has been prepared in the national languages of the partner countries involved. Participants have been ensured total anonymity, meaning that conclusions from the feedback contributed can be applied widely to analyze the efficacy of the training material developed among the participating countries.

The pilot, in which 30 student participants from Istanbul and Muğla took part, consisted of a presentation on the project's objectives and results, followed by a walkthrough of the learning materials and platform by the Turkish partners and participant-led exploration of the platform and the materials. Afterward, the feedback questionnaire was completed. The feedback tool was formatted in a Google form and was designed to assess the quality of the materials as well as assess the platform's user-friendly features. It included various sections, which aimed to assess the results obtained overall, the results of individual learning nuggets, the e-learning platform, and provide an overall evaluation. A mix of multiple-choice and open-ended questions was chosen. Each section was precluded by clear instructions, both to guide the respondent and ensure their understanding of the survey questions, and their options.

### Pilot Testing Evaluation

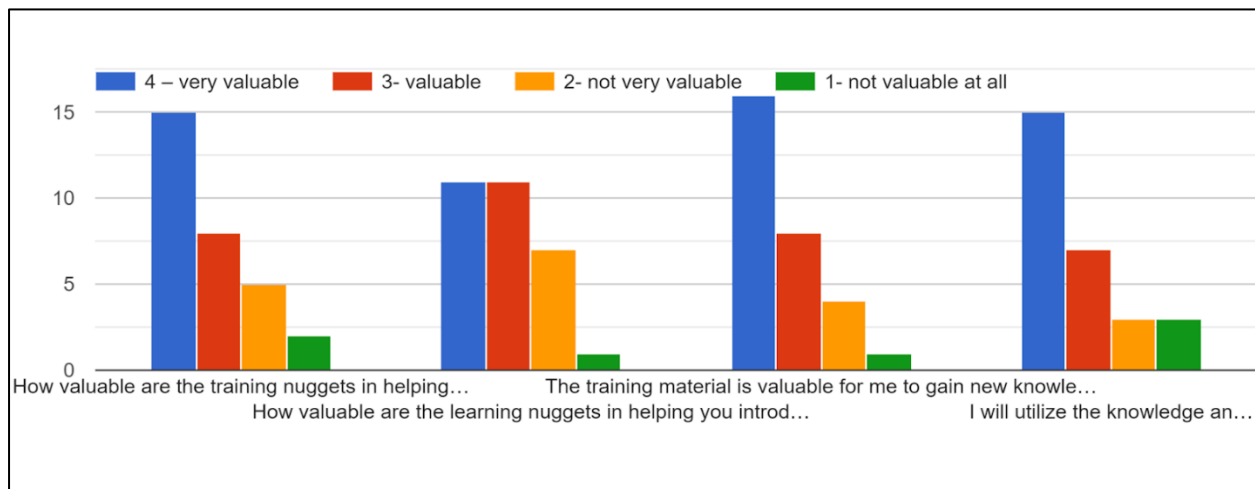
After an introductory question about the respondent profile, the questionnaire is structured in 4 main sections, namely:

- Section 1: Overall quality of the results;
- Section 2: Quality of the Learning Nuggets;
- Section 3: Quality of the E-Learning Platform
- Section 4: General Evaluation

All participants in the Turkish pilot study are students.

## Part 1: OVERALL QUALITY

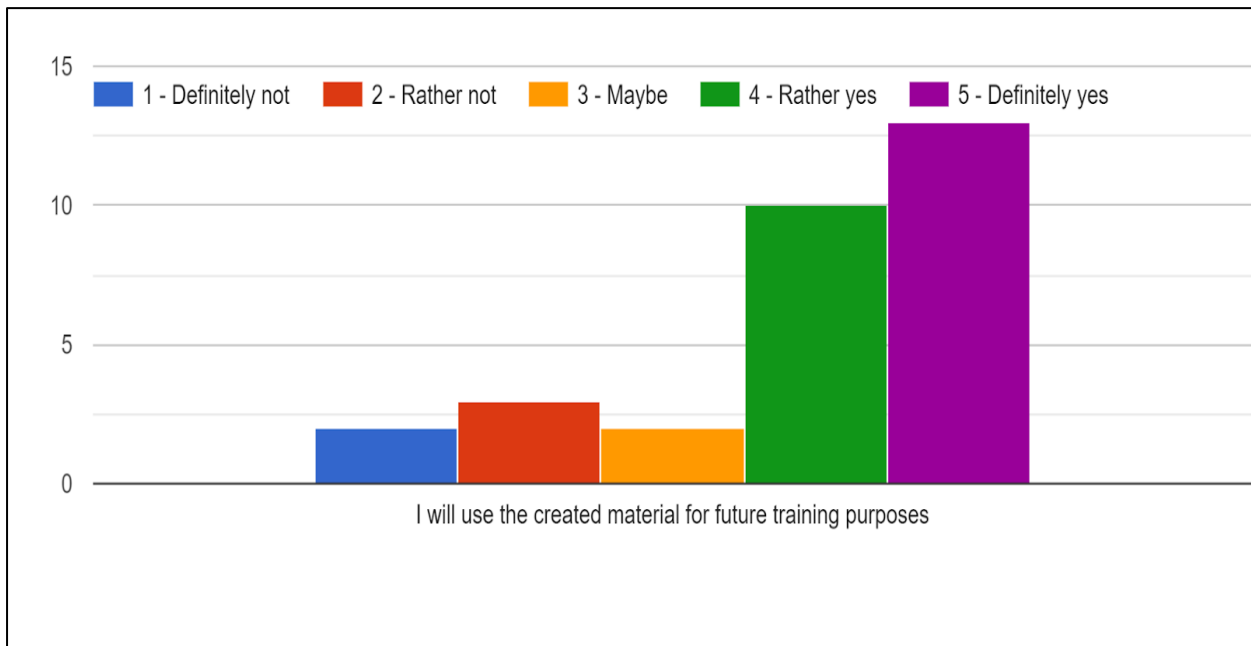
According to the responses, it was determined that the platform and the learning nuggets prepared were very rich and useful in terms of content and quality, and that they were considered by the respondents to be worth using in the future. The distribution of the 30 different results obtained is shown in the graph below:



In addition to the survey results obtained, two participants who wanted to give additional opinions made the following comments:

*“Everything was good.”*

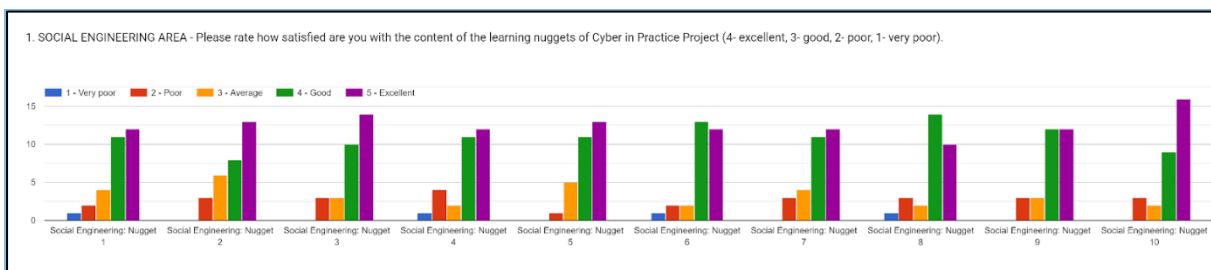
*“The content of nuggets are brief and very well explained.”*



## Part 2: QUALITY OF THE LEARNING NUGGETS

In this section, learning nuggets in 7 different areas are evaluated separately. This section, in which each nugget in each area is evaluated, provides us with an external audit eye as well as the internal audit that has already been carried out.

The survey results regarding the nugget evaluations related to the Social Engineering Area are as shown in the graph below:



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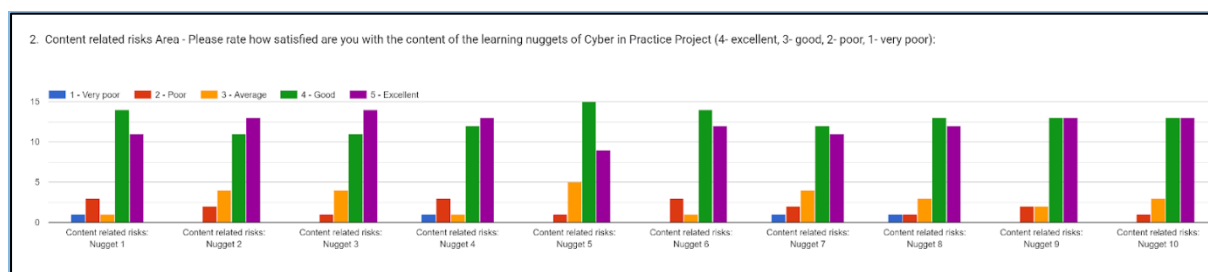
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In addition to the survey results obtained, two participants who wanted to give additional opinions made the following comments:

*“Some nuggets’ language is a bit theoretical.”*

*“Article content could be more spesific.”*

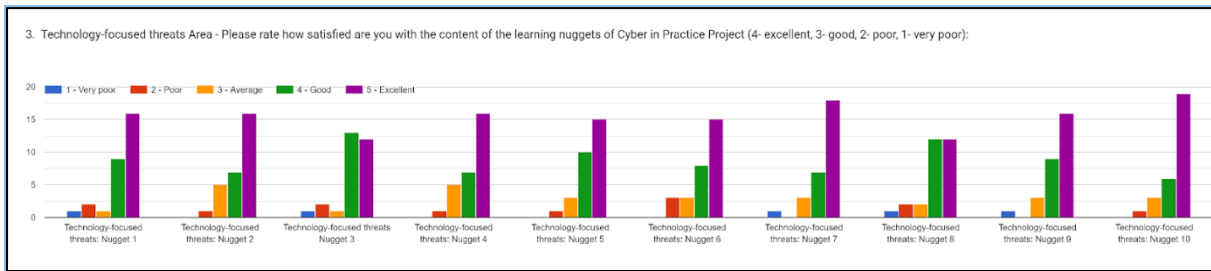
The results of the survey on nugget evaluations related to content related risks are as in the graph below:



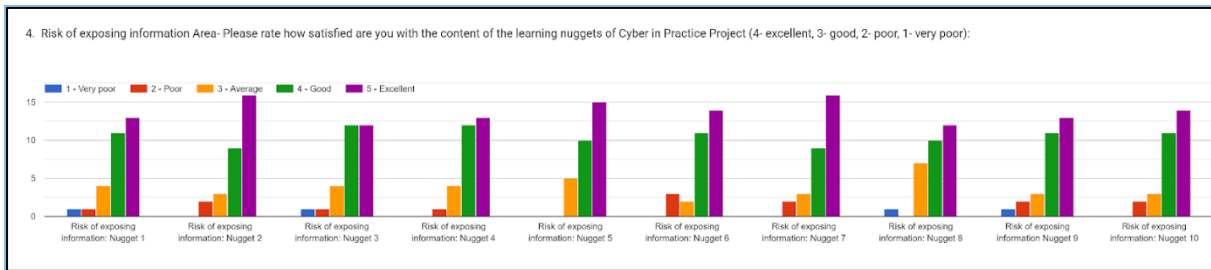
In addition to the survey results obtained, a participant who wanted to give additional opinions made the following comments:

*“Language can be more simple.”*

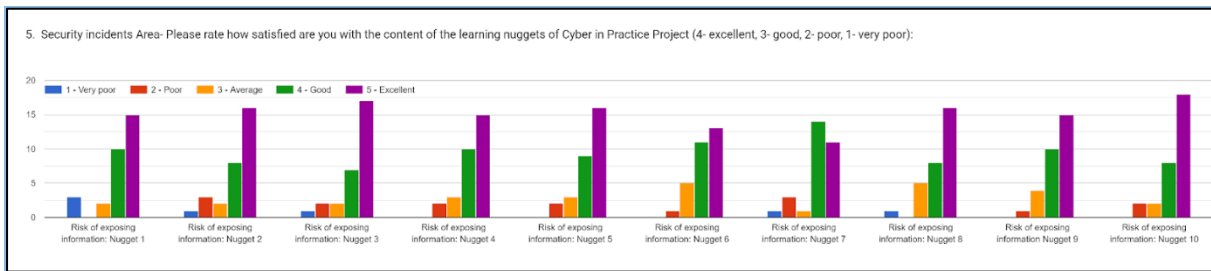
The results of the survey on nugget evaluations related to technology focused risks are as in the graph below:



The survey results regarding the nugget evaluations on the risk of exposing information are as in the graph below:



The results of the survey on nugget evaluations related to security incidents are as in the graph below:

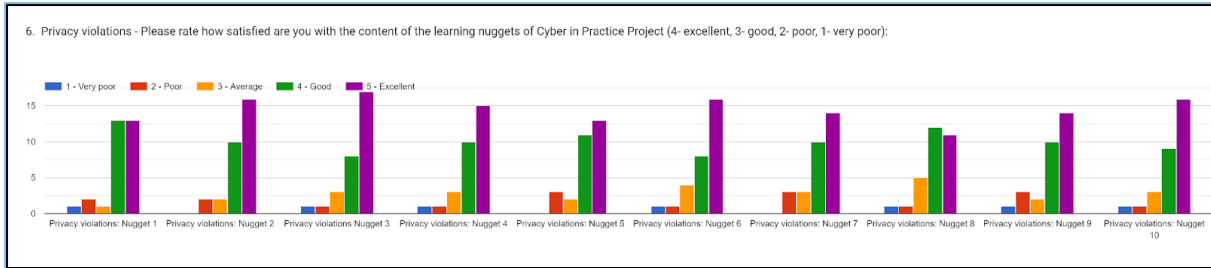


The results of the survey on nugget evaluations related to privacy violations are as in the graph below:

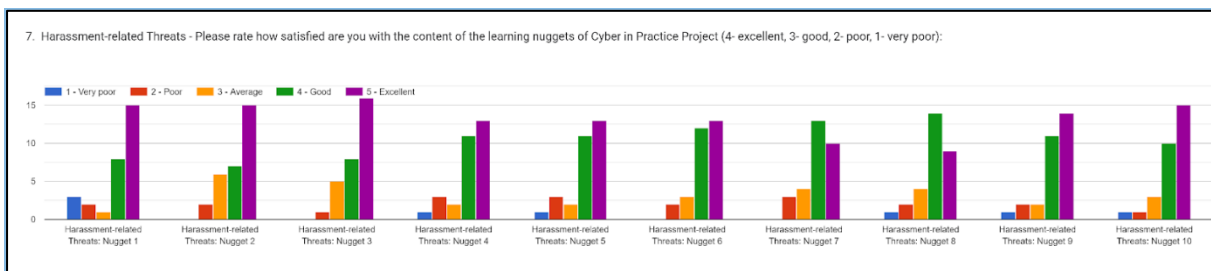
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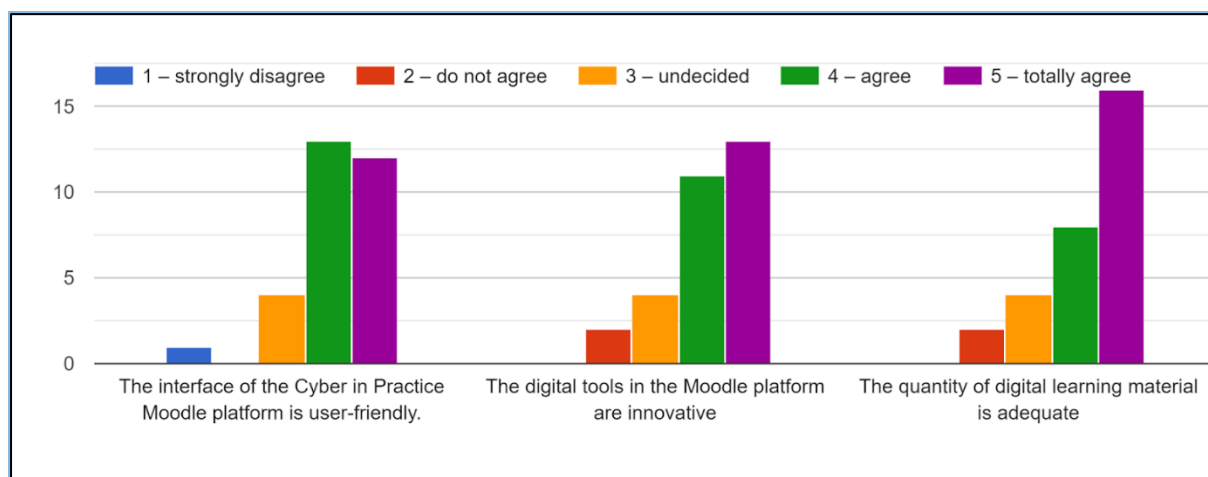
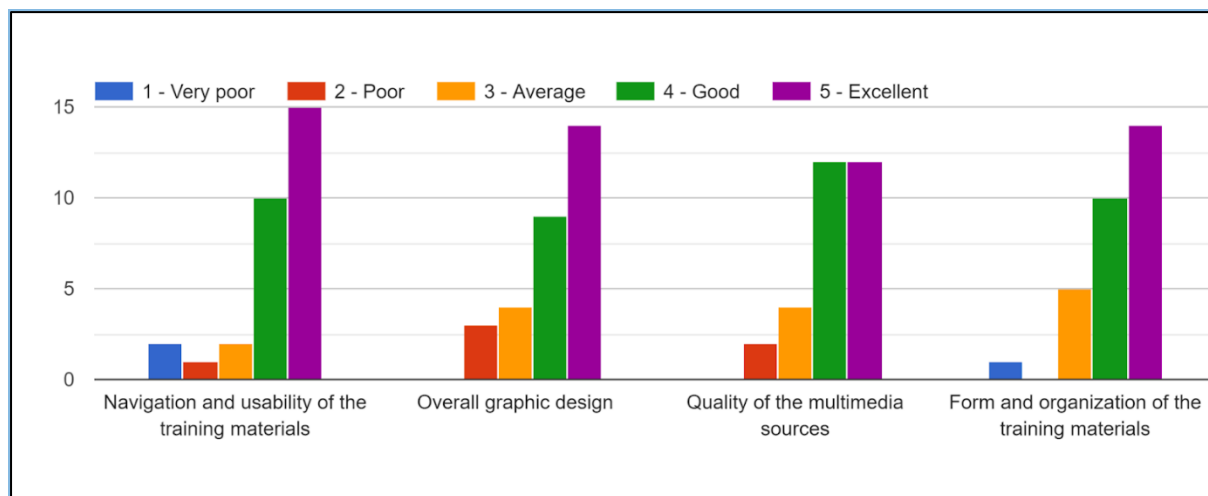
The results of the survey on nugget evaluations related to harassment related risks are as in the graph below:



### Part 3: QUALITY OF e-LEARNING PLATFORM

In the related section, the evaluations and opinions of the users about the e-learning platform are given. In this context, it is seen that users find the interface of the platform, the design of the visuals and graphics used, the quality of multimedia resources, and the innovation of digital tools very good.

In this context, the graphs related to the results obtained are shared below:



#### Part 4: GENERAL EVALUATION

Following the specific evaluations regarding the content of the learning nuggets and the use of the e-platform, users were asked to make general evaluations and subjective comments. In this context, the sentences of the users who expressed their opinions are given below:

*“Nuggets are really practical for quick learning process.”*

*“They aim to reduce regional disparities about cybersecurity skills and competencies in partner countries.”*

*“They support the identification of cyber threats and security gaps in higher education.*

*“They help the main target groups to become aware of cyber risks by putting the requirements of cybersecurity in higher education institutions in the EU.”*

*“They promote transitions in putting cybersecurity by providing innovative learning nuggets and disseminating the main deliverables of the Project”*

*“They strengthen networking to solve common problems about putting cybersecurity in partner countries by generating and sharing knowledge among partners.”*

*“In general, I can say that the content of the articles is good. A simple language for learnability.”*

When asked about the prominent weaknesses of the prepared learning nuggets, the participants made the following comments:

*“Some enuggets are a bit theoretical.”*

*“The learning nuggets may not cover all the relevant topics and scenarios that non-IT students may encounter in their future careers. Cybersecurity is a dynamic and complex field that requires constant updating and adaptation.”*

*“The learning nuggets may not be engaging or interactive enough to motivate and retain the attention of the learners. Cybersecurity can be perceived as boring or intimidating by some students, especially if they lack prior knowledge or interest in the subject.”*

*“The learning nuggets may not be aligned with the learning outcomes and assessment methods of the non-IT courses that they are integrated into. This could create confusion or inconsistency for the students and the instructors.”*

## PILOT-TESTING RESULTS IN ITALY

### Introduction

This document is a national report produced under the scope of the Cyber in Practice Cybersecurity in practice for non IT oriented HE courses Erasmus+ project, hereinafter referred to as Cyber in Practice.

This national report summarizes the processes, the activities, the feedback, the improvements and the changes needed according to the pilot testing.

The main aim of the report is to present the results from the pilot-testing that was conducted in Italy between September 2023 and January 2024.

The methodology followed consisted in an evaluation phase at distance and a final questionnaire with multiple choice and open and closed questions for at least 30 participants that collaborated during the pilot-test between September 2023 and January 2024.

During the pilot testing phase, the project, the learning nuggets and the platform were presented and the pilot evaluation was carried out. The introduction to the project was followed by an individual/group navigation through the platform and nuggets. Participants were introduced to the project and then navigated through the platform and specific nuggets, specifically those focusing on "**Social Engineering**," "**Technology-focused threats**," "**Security incidents**," and "**Privacy violations**" of the testees interest. The Italian team selected these nuggets based on their relevance and importance according to previous project research and use cases. All the respondents have evaluated the training through the Google form questionnaire that was created by the partners for the purpose of this activity.

The evaluation addressed the following main topics:

#### A) OVERALL QUALITY

#### B) QUALITY OF THE LEARNING NUGGETS

#### C) QUALITY OF E-LEARNING PLATFORM

#### D) GENERAL EVALUATION

The results of the pilot-testing in Italy are thus compiled in this national report.

## Pilot Testing Evaluation

In Italy, a total of 33 participants took part in the pilot-testing between September 2023 and January 2024. All of the participants were involved in the face-to-face evaluation process. The evaluation process consisted of three stages: firstly, the trainers introduced the objectives of the event and presented the main results of the Cyber In Practice project. Secondly, the participants were shown the Cyber In Practice Nuggets Platform to familiarize them with its functionalities, how to access it, and the specifications of the nuggets frameworks. Lastly, the participants were given 30 minutes to explore the platform and review some of the provided nuggets on their own. Following this, they completed an evaluation questionnaire.

The pilot testing evaluation included various target groups such as high school teachers, university students, HE professors, and academic staff from both IT and non-IT faculties who actively participated in the event. As well as VET experts, trainers and representatives of the VET and Adult education system took part in the pilot testing evaluation within Cyber In Practice. More specifically:

- 24 university students from both IT and non-IT faculties
- 8 persons among trainers, adult educators and VET experts of the system
- 1 Researcher

The upcoming sections will outline all the insights gathered from the questionnaires completed by the pilot training participants. This feedback will be crucial in identifying areas of improvement for the Cyber in Practice training program.

## Part 1: OVERALL QUALITY of Cyber in Practice learning programme

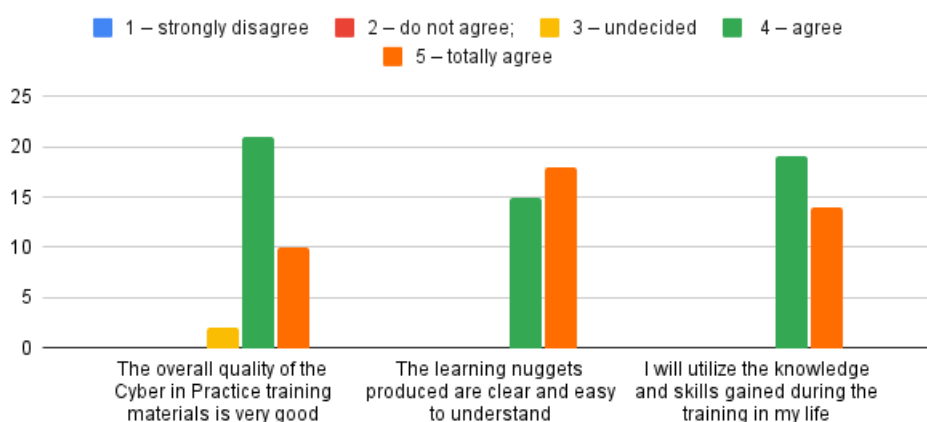
In this section, the participants answered the following 3 questions with a scale from 1 to 5 (1=strongly disagree, 2=disagree, 3=undecided, 4= agree, 5= totally agree) :

Q1- The overall quality of the Cyber in Practice training materials is very good

Q2- The learning nuggets produced are clear and easy to understand

Q3- I will utilize the knowledge and skills gained during the training in my life

### The overall quality of the Cyber in Practice training programme



Feedback collected on the training programme developed by the consortium was overwhelmingly positive. According to the data, 31 out of 33 participants either totally agreed or agreed with the quality of the overall programme, with only 3 remaining undecided. This indicates that the majority of respondents viewed the **training programme favourably**.

Additionally, all respondents expressed agreement with the clarity and ease of understanding of the training nuggets, suggesting that they found the material to be well-presented and comprehensible.

Furthermore, all participants indicated that they believed the knowledge and skills acquired during the training would be beneficial for future use, highlighting the value and effectiveness of the training material in enabling the acquisition of new capabilities.

Overall, the feedback received on the training programme reflects its high quality and effectiveness in delivering valuable knowledge and skills to participants.

## Part 2: QUALITY of THE LEARNING NUGGETS

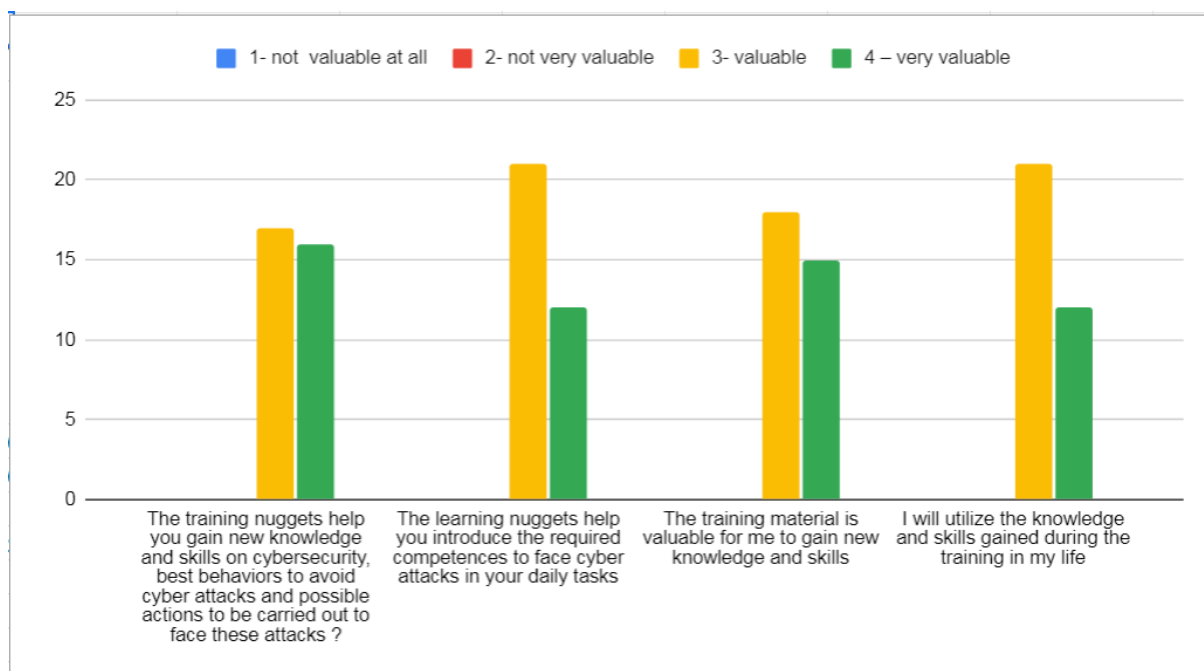
The Second section of the questionnaire addresses the quality of the Cyber in Practice Nuggets/modules. In this section, the participants answered the following 4 questions with a scale from 1 to 5 (1=Not valuable at all, 2=Not very valuable, 3=valuable, 4= very valuable):

Q1- The training nuggets help you gain new knowledge and skills on cybersecurity, best behaviours to avoid cyber attacks and possible actions to be carried out to face these attacks ?

Q2- The learning nuggets help you introduce the required competences to face cyber attacks in your daily tasks

Q3- The training material is valuable for me to gain new knowledge and skills

Q4- I will utilize the knowledge and skills gained during the training in my life



The analysis of the data from the chart revealed that every respondent provided extremely positive responses to all four questions, showing unanimous agreement on the value of the training nuggets.

The respondents unanimously agreed that the training nuggets are highly beneficial in expanding their knowledge and expertise in cybersecurity. The chart clearly illustrated that the content of the training nuggets was regarded as either "valuable" or "very valuable" in aiding respondents to develop new skills in the field.

Furthermore, the respondents expressed unanimous belief that the training nuggets effectively introduce the necessary competencies required to combat cyber attacks in their daily tasks. They also unanimously agreed that the training material is indispensable for acquiring new knowledge and skills in cybersecurity.

Moreover, all respondents indicated that they intend to apply the knowledge and skills gained through the training in practical situations. This overall positive evaluation of the training nuggets in cybersecurity suggests that they are successful in delivering valuable information and resources to individuals seeking to enhance their cybersecurity capabilities.

As open-ended question, they answered the following question: "Indicate what worked well and what did not." Here is the main answers collected:

When asked to share their thoughts on what went right and what could be improved, participants highlighted the seamless functionality of the overall experience. They noted the thorough yet concise content, the user-friendly platform, and the valuable information that was easily understood by those new to the topic. In short, the feedback was overwhelmingly positive.

The next question was specifically aimed at trainers and adult educators regarding their plans for incorporating the training programme into their future courses. The responses provided



valuable insights and perspectives on the potential impact and effectiveness of the program in various educational settings.

The section concludes with an open-ended question prompting respondents to share what aspects of the project they felt were successful and what aspects needed improvement.

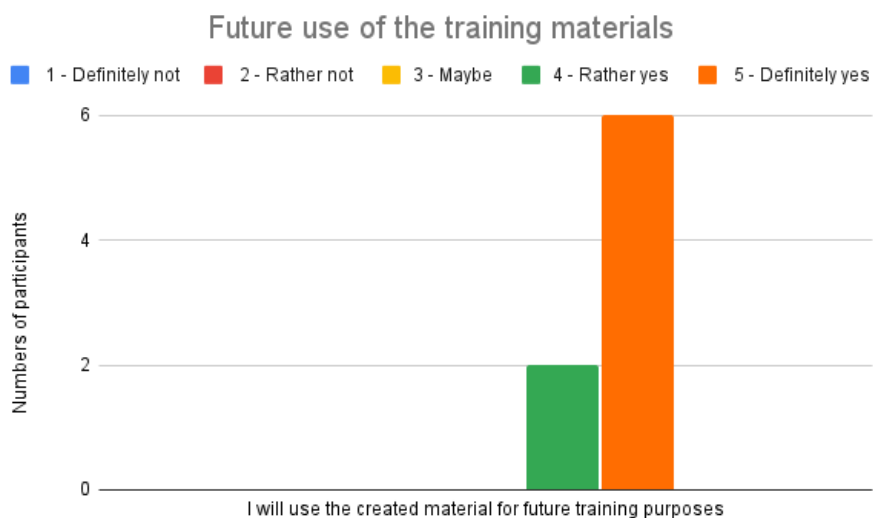
Feedback emphasized the necessity of clarity and brevity in the project's content, with users noting no issues with functionality and overall satisfaction with the platform.

Suggestions were made for the inclusion of more case studies specific to the Italian national context.

The platform was praised for its user-friendly interface and easily comprehensible content, even for individuals not well-versed in the subject matter.

In summary, the feedback was largely positive and highlighted the successful elements of the project.

The following question specifically targets trainers, educators, and university lecturers, inquiring about their intentions to utilize the developed material for forthcoming training sessions.



All participants in the pilot testing, including trainers, educators, and university lecturers, expressed their intention to incorporate the created material into their future training programs and educational courses.

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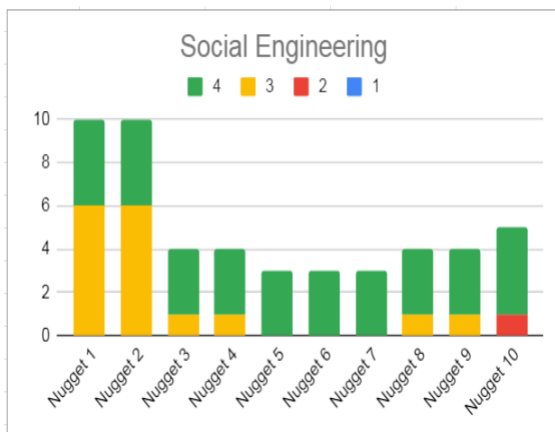
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### Part 3: LEARNING NUGGETS

In this section of the survey, participants were asked to rate the quality and satisfaction level of the training "nuggets." Specifically, they were requested to assess the thematic area and corresponding learning materials they had reviewed in order to gauge their quality. Each thematic area included 10 learning "nuggets," and respondents only evaluated those they had read and analyzed:

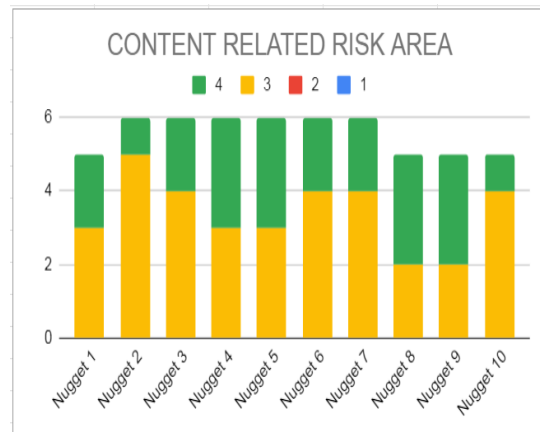
1. Social Engineering
2. Risks related to content
3. Technology-centered threats
4. Risk of exposure of sensitive data and information
5. Security incidents
6. Privacy breaches
7. Harassment-related threats

Social Engineering

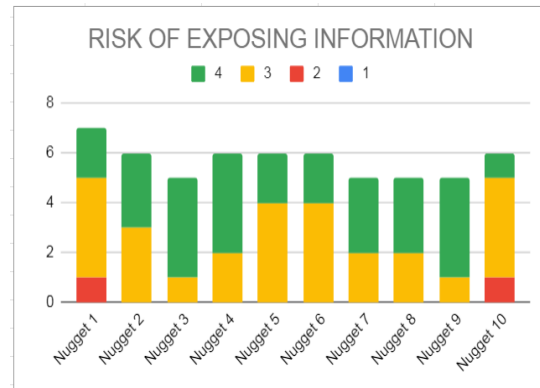
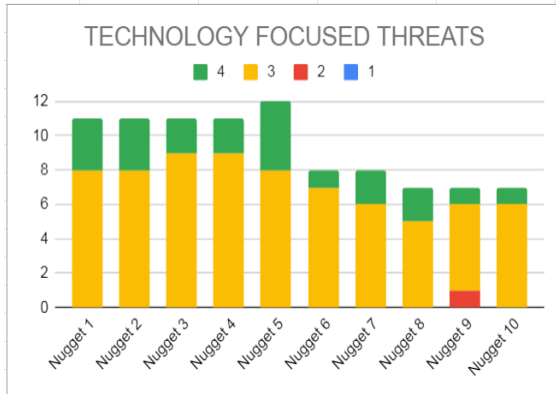


Technology-centred threats

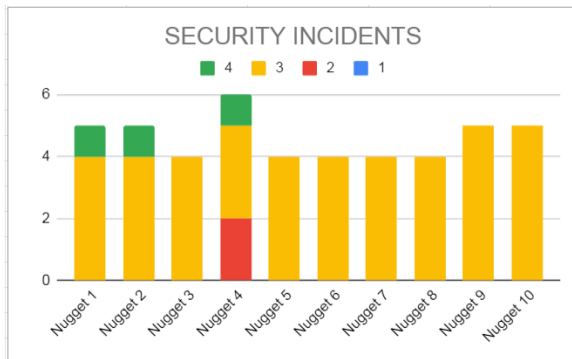
Content Related Risk Area



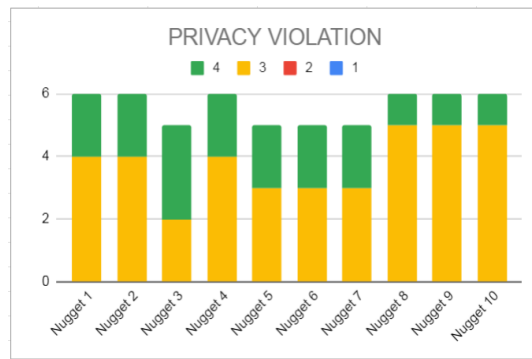
Risk of exposing information



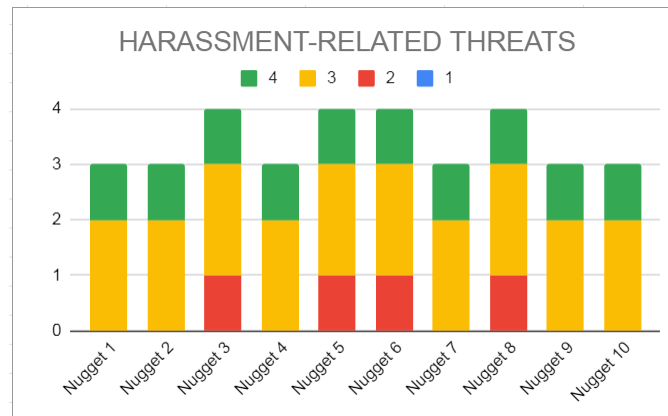
### Security Incidents



### Privacy Violation



### Harassment-related threats



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The next open-ended question at the end of the nuggets section asked, "How do you think the content of the learning Nugget could be changed or improved?"

AREA 1 The respondents were also asked to express what they think could be changed/improved in terms of the content of the learning nugget. Based on the primary feedback gathered from Area 1 and its nuggets, the evaluation criteria are generally well-defined, though the final element could be further defined. The videos are both captivating and educational, but it is suggested to incorporate a practical activity illustrating steps to combat social engineering attacks. Moreover, incorporating references and detailed case studies specific to the Italian national landscape would enrich the material. A concise overview of the possible outcomes of social engineering attacks within a university environment would also be beneficial. Lastly, some videos may benefit from additional content to ensure a thorough grasp of the topic.

AREA 2 The respondents were also invited to share their thoughts on potential changes or improvements to the content of the learning Nugget. Some feedback included concerns that certain videos may not sufficiently explain the topic at hand, and that others could benefit from a more concentrated focus on the theme.

AREA 3 In order to enhance user experience, it is important to establish a clear navigation path within the learning Nugget that guides users back to the beginning if they select path B. Another suggestion is to include multiple correct solutions to quiz questions, encouraging users to think critically and delve deeper into the topic. To reinforce learning on password and privacy management, consider incorporating hands-on exercises or quizzes. Additionally, incorporating practical exercises beyond multiple-choice questions will further engage users. Lastly, designing challenging quizzes that prompt users to apply their knowledge and think critically about the content will enrich the learning experience.

AREA 5 The exercise of nugget 4 is not very clear and the translation needs to be revised. Some videos are in English and may not be very interesting for those who do not know the language. The infographic is very interesting but it is not possible to click and open the links provided; however, it is possible to download the infographic to access all the content and links. The fact that there is more than one correct answer to the quiz can create problems for the user in finding all the correct answers. Perhaps including a list of the other correct answers in the feedback would be helpful. The videos are sometimes not very useful for explaining the topic

AREA 6 The first three nuggets are very clear and easy to understand. Nugget 7 could be enhanced by including more information relevant to the topic. Consider incorporating case

studies to provide additional insights. It is important to note that English videos may not be as effective for individuals who are not fluent in English. Consider providing translations or subtitles to improve understanding for all viewers.

AREA 7 Some possible improvements to the content of the learning Nugget could include adding a more extensive quiz section to the final quizzes. Additionally, it may be beneficial to remove the video in Nugget 1 and instead use the panels as in Nugget 2. It also appears that the target audience may be younger than intended, so adjustments may need to be made in order to better align with the desired demographic.

Nugget Area	Comments
Area 1	<p>No suggestions, everything is clear and well organized. The last evaluation element is sometimes not very clear.</p> <p>They are enjoyable.</p> <p>A hands-on activity to put into "practice" measures against a social activity attack.</p> <p>A concluding nugget on all the possible actual consequences of a social engineering attack in a university environment.</p> <p>Some videos contain very little content.</p>
Area 2	<p>Some videos could be more focused on the topic.</p>
Area 3	<p>Clicking on path B redirects users to random slides, rather than the starting slide.</p> <p>Adding a hands-on quiz for practicing password management and privacy could enhance learning.</p> <p>Incorporating practical exercises in quizzes, instead of just multiple choice questions, would be beneficial.</p>

	Users would appreciate more challenging quizzes that encourage deeper reflection on the content.
Area 4	
Area 5	<p>Some videos are in English and may not be very interesting for those who do not know the language. The infographic is very interesting but it is not possible to click and open the links present; however, it is possible to download the infographic to access all the content and links.</p> <p>Having more than one correct answer to the quiz can create problems for the user in finding all the correct answers. Maybe include a list of the other correct answers in the feedback.</p> <p>Videos are sometimes not very helpful in explaining the topic.</p>
Area 6	The case studies could provide some additional information.
Area 7	The learning Nugget could include adding a more extensive quiz section to the final quizzes

## Part 4: QUALITY OF E-LEARNING PLATFORM

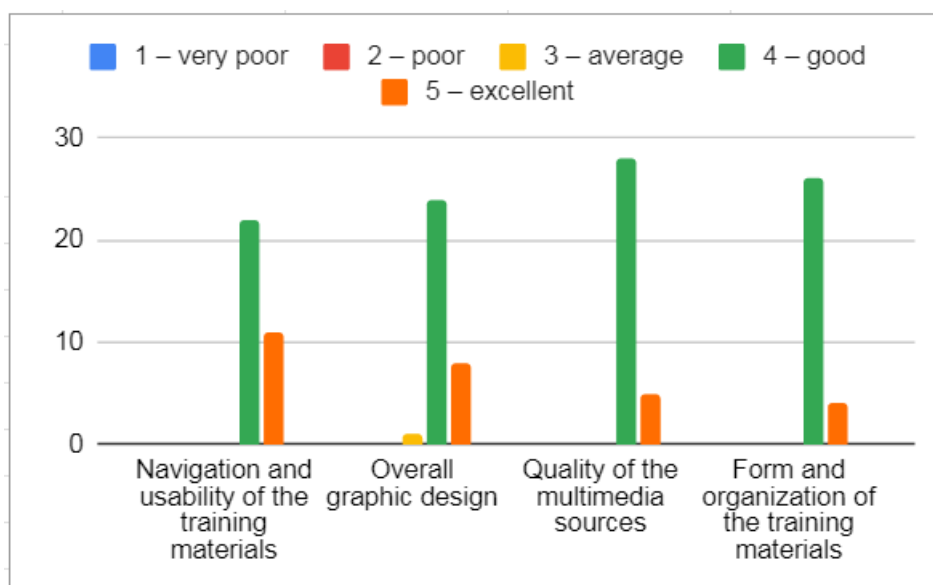
The fourth section of the questionnaire aimed at evaluating the quality and easiness to use of the e-learning platform. In this part participants were asked to assess the quality of the platform. The two types of questions were an open-ended question and a closed question is related to the quality of the platform. In this section, the participants answered 4 questions with a scale from (1 – very poor; 2 – poor; 3 – average; 4 – good; 5 – excellent):

1-Q1 Navigation and usability of the training materials

2-Q2 Overall graphic design

3-Q3 Quality of the multimedia sources

4-Q4 Form and organization of the training materials



The respondents unanimously praised the high quality of the e-learning platform. They all gave it high scores, indicating their satisfaction with the navigation and usability of the training materials, the overall graphic design, the quality of the multimedia sources, and the form and organization of the training materials. It is clear that the respondents found these aspects to be useful and effective in enhancing their learning experience.

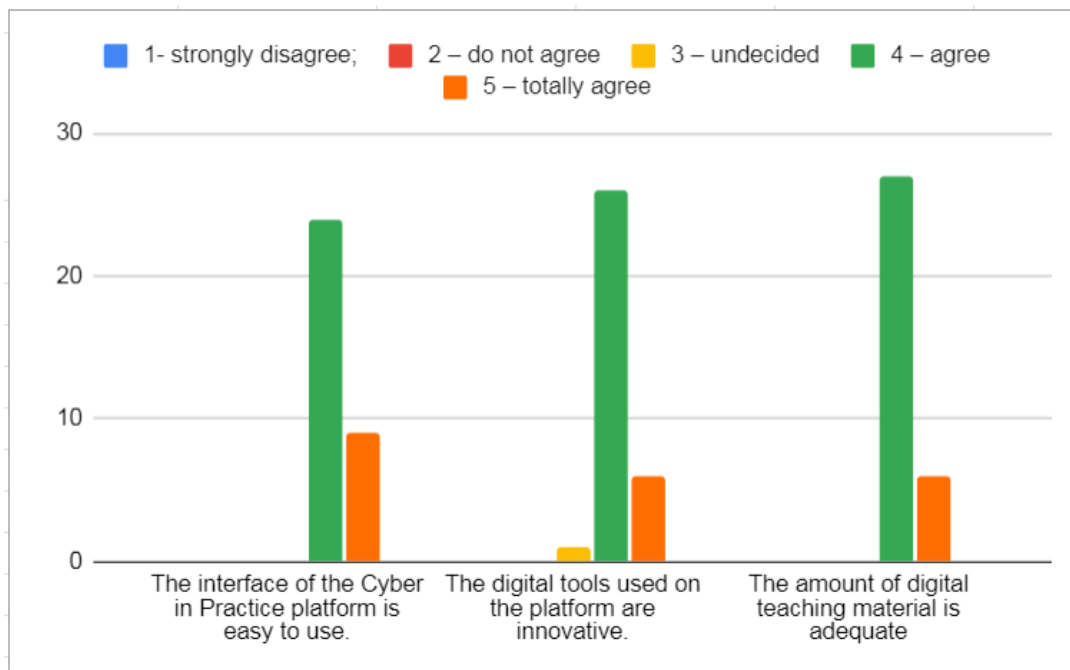
In the second part, the participants were asked to assess other elements of the platform answering the following questions:



Q1: The interface of the Cyber in Practice platform is easy to use.

Q2: The digital tools used on the platform are innovative.

Q3: The amount of digital teaching material is adequate



All respondents appreciated the high quality of the e-learning platform, giving it high scores across the board. Users were particularly satisfied with three key aspects: the user-friendly interface of the Cyber in Practice platform, the innovative digital tools used on the platform, and the ample amount of high-quality teaching materials available. These aspects received positive feedback from all respondents, highlighting the platform's overall effectiveness and usability.

After using the Moodle Cyber in Practice platform, respondents are asked to indicate if their needs were met and provide feedback on potential changes or improvements. One suggestion for improvement is to add a short initial guide with 4-5 steps for users to make the most out of the platform. Users find the nugget format helpful in addressing complex issues in small steps and appreciate the ability to track which nuggets they have viewed. Some users suggest adding a forum for discussion with other students. Overall, users find the platform easy to use and useful for both individual and classroom use.

## Part 5: GENERAL EVALUATION

The fifth and last section of the questionnaire is a global evaluation of the training program and platform. In the last three general questions the participants gave their feedback about the strengths and the weaknesses of the training program.

1. What are the most positive aspects (strengths) of the Cyber in Practice learning nuggets?
2. What are the most negative aspects (weaknesses) of the Cyber in Practice learning nuggets?
3. Do you have any other comments?

The Cyber in Practice learning nuggets offer numerous strengths. They are user-friendly and easy to navigate, making it simple to access and learn the content. The concise nature of the nuggets allows for focused learning on specific information, making them particularly beneficial for grasping basic concepts. The consistent format of the nuggets makes them enjoyable to follow and easy to understand. The variety of presentation materials enhances the overall learning experience, making the content engaging and stimulating. Additionally, the nuggets provide brief but complete information that is easy to retrieve and assimilate, helping users acquire micro knowledge and focus on meanings. Overall, the Cyber in Practice learning nuggets offer an effective and efficient way to learn important cyber concepts.

The most negative aspects or weaknesses of the Cyber in Practice learning nuggets include challenges in understanding the connection between certain nuggets, the lack of elaboration in quizzes, and the clarity of the penultimate slide. There are some areas for improvement when it comes to the Cyber in Practice learning nuggets. One issue is the difficulty in understanding how the nuggets are connected to each other. The quizzes provided are quite basic and there is a lack of more in-depth assessments. The slides could be clearer and more comprehensive. Users also have to keep track of their own progress, which can be a bit of a hassle.

Certain information may seem obvious to some users, and videos sometimes lack explanation. The content can feel fragmented at times, making it hard to follow a logical learning path. It can also be challenging to tell which nuggets have been viewed and which have not. Technical issues, such as videos not working properly, can also detract from the learning experience.

Feedback from users also suggests that providing external resources for further information would be beneficial. Additionally, a short guide on how to navigate the platform for those who are unfamiliar with LMSs like Moodle would be helpful in improving the overall user experience.

## PILOT-TESTING RESULTS IN BULGARIA

### Introduction

The aim of the present national report is to present and analyse the Bulgarian results received from the implementation of Result 3, Task 3 (R3/A3) “Conducting Pilot Testing in Partner Countries”. It summarizes the processes, the activities, the feedback, the improvements and the changes needed according to the pilot testing of the integrated nuggets into non IT oriented HE courses.

According to the project proposal, the Italian partner Training2000 developed a document with a Testing Methodology (R23/A4). The document was discussed and approved by all partners in the Consortium. It contains clear recommendations on the process of nuggets integration into non IT disciplines, thus supporting trainers and university lecturers in making use of the Cyber IN Practice outputs and in implementing future training courses or atoms of cybersecurity knowledge into their courses based on the materials created.

At the end of the Testing Methodology a prototype of the Feedback Questionnaire was proposed to be used by all partners. This approach enables the data obtained from partners in different countries to be comparable. The filled-in questionnaires give a feedback on the opinions of the end-users from the target groups.

The testing process in Bulgaria took place from the end of September to the middle of December 2023.

Total of 40 participants took part in the study, and their composition was quite diverse. The main group of participants (28) were students from non-IT majors plus 1 PhD student. In addition to them, university lecturers (3) and representatives of the university administration (4) were surveyed. A number of external participants (5) were also surveyed and given the opportunity to review all of the training video fragments (nuggets) created and give a specific opinion on 10 of them. The external participants are a special group because the approach to working with them was more specific – they have not attended academic lessons with incorporated nuggets in them, thus, they evaluated the learning fragments (nuggets) on their own.

For the university staff (students, lecturers, administrative and other staff) during the pilot testing phase, the project, the learning nuggets and the platform were presented and the pilot

evaluation was carried out. The introduction to the project was followed by an individual/group navigation through the platform and nuggets.

In addition to the selected learning video fragments (10 of 69) used in the teaching process, the participants had the opportunity to familiarize themselves with all the learning fragments (69) produced and published on the Platform under the implementation of the present project.

By the Feedback Questionnaire three main groups of components were evaluated.

- Overall quality of the approach and process of produced learning fragments (nuggets) with 6 questions asked;
- Content quality of the Learning video fragments (nuggets) – 10 out of 69 learning fragments were included into the online questionnaire. They had to be evaluated using 4 points scale. One more “open” question asked for a written opinion on what can be improved in the learning video fragments observed;
- Quality of the e-learning platform – 3 multiple choice questions were asked. The fourth question was of “free answer” type asking for an opinion and for giving suggestions how the platform can be further improved.

At the end of the teaching process, the feedback questionnaire was filled in. All the respondents have evaluated the training through the google form questionnaire. In order to facilitate filling in the questionnaire, it was translated into Bulgarian language following the standard approved by all partners in the consortium.

The sections below in this report present the results obtained from the research done.

## Pilot Testing Evaluation

The questionnaire is structured in 6 sections, namely:

- Section 1 of 6: Introduction;
- Section 2 of 6: Address Data;
- Section 3 of 6: Learning video fragments (nuggets);
- Section 4 of 6: Overall quality of the process;
- Section 5 of 6: Quality of the Learning Nuggets;
- Section 6 of 6: Quality of the E-Learning Platform.

All questions are preceded by clear instructions, which have a double task: on the one hand, to introduce the respondent to the meaning of the question asked, and on the other hand, to

instruct him how to act in the specific situation (see the template of the Questionnaire enclosed in the end of this document).

## Section 1 of 6: Interactive Cyber Security Learning Fragments. Feedback Questionnaire

This section presents the project within which the survey was developed and introduces respondents to the aims and objectives of the questionnaire.

This questionnaire has been developed within the Cyber in Practice project of the Erasmus+ programme. With it, the project team aims to get information about your opinion on the developed short learning fragments dedicated to cyber security and about your assessment of the platform on which they are published.

Please fill in the questionnaire honestly and carefully and thus support the reliability of the collected data!

## Section 2 of 6: Address data

This section contains a minimum number of address data, helping to specify the groups of respondents. The data in this section allows to identify the characteristics of the targets groups in terms of their number, personal profiles and area of expertise. Total of 3 questions are asked in this section: the first one is addressed to the respondents from the University. The next two questions are intended for the external individuals invited to take part in the survey.

The question 1 is: **If you are a member of the University community, please specify whether you are:**

- Teacher
- Student
- Employee in administration
- Other

Figure 1 below presents the distribution of the participants by their position in the University. Total 35 (out of 40) of the respondents declare that they are members of the UNIBIT community. From them, 28 (80%) are students, 3 (8,6%) are lecturers, 1 (2,9%) administrative staff, 2 (5,8%) participants define themselves as other university staff, and 1 (2,9%) PhD student took part in the study.



Figure 1: **If you are a member of the University community, please specify whether you are...**

As it was mentioned above, there is a small group of external specialists invited to fill-in the online questionnaire having a look only on the learning video fragments themselves without participating in the real training process. Total of 5 such individuals were invited to take part in the study. However, as you can see from the Figure 2 below total of 20 persons have answered to the **Question 3: If you work in another sphere of business/public life, specify the position held by choosing the most appropriate.**

- 8 (40%) respondents state that they belong to the group of Development staff;
- 7 (35%) respondents are working as an Executive staff;
- 3 (15%) persons are working as Service personnel;
- 2 (10%) respondents belong to the group of Management staff.

The greater number of respondents to this question can be explained by the fact that many of the surveyed students, along with their studies, they use to work in various spheres of economic and social life. Although questions 2 and 3 were intended only for the external respondents, they were worded in such a way that the students perceived it necessary to reflect the type of their employment.

Although additional information was obtained with these two questions, it can be assumed that the data on students' employment are not particularly relevant to the present study.

### 3. Ако работите в друга сфера на стопанския/обществения живот, уточнете заемания пост:

Copy

20 responses

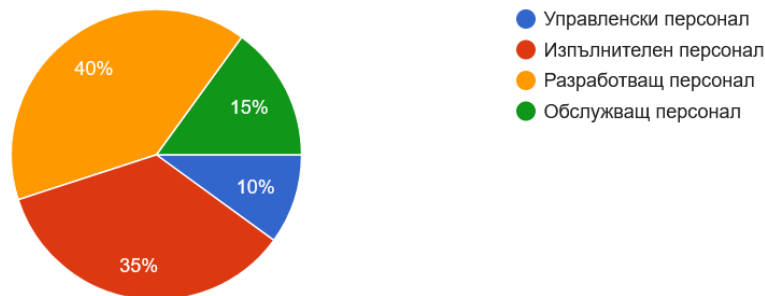


Figure 2: If you work in another sphere of business/public life, specify the position held by choosing the most appropriate

## Section 3 of 6: Learning video fragments (nuggets)

In order to facilitate the work of the participants in filling out the survey card, the 10 learning video fragments (nuggets) used in the training process, were embedded in the online survey from the very beginning.

The introductory text to this section was as follows:

#### Instruction

Please view the following video nuggets. The questions following the video clips are related to their content.

In order to improve the reading conditions, please press the "YouTube" button in the lower right corner of each educational video fragment. In this environment, you will be able to pause and rewind the recording for better perception. In "YouTube" mode, you will also be able to display the video in full screen by pressing the button to the right of the "You Tube" inscription.

The titles of the selected learning fragments (nuggets) are:

- No. 1: Love Story
- No. 2: Social Engineering Intro
- No. 3: Top 10 Emerging Cyber Security Threats (2023)
- No. 4: False Connection
- No. 5: Open Web Application Security Project (OWASP)
- No. 6: Do not Trust Emoted. The Case of Duisburg-Essen University, Germany
- No. 7: Cyber Attack at University Level
- No. 8: Be Aware - Connect with Care
- No. 9: It is a Trap
- No. 10: Cyber Bullying and Stalking

The survey was published in the environment of the Cyber IN Practice Moodle based platform. In addition to the 10 learning fragments used in the training process and then embedded in the questionnaire, the respondents were encouraged to view all 69 learning video fragments produced by the partners in the consortium and published in the platform, so to be more objective when evaluating the relevance of the platform created.

## Part 1: OVERALL QUALITY

### Section 4 of 6: Overall Quality

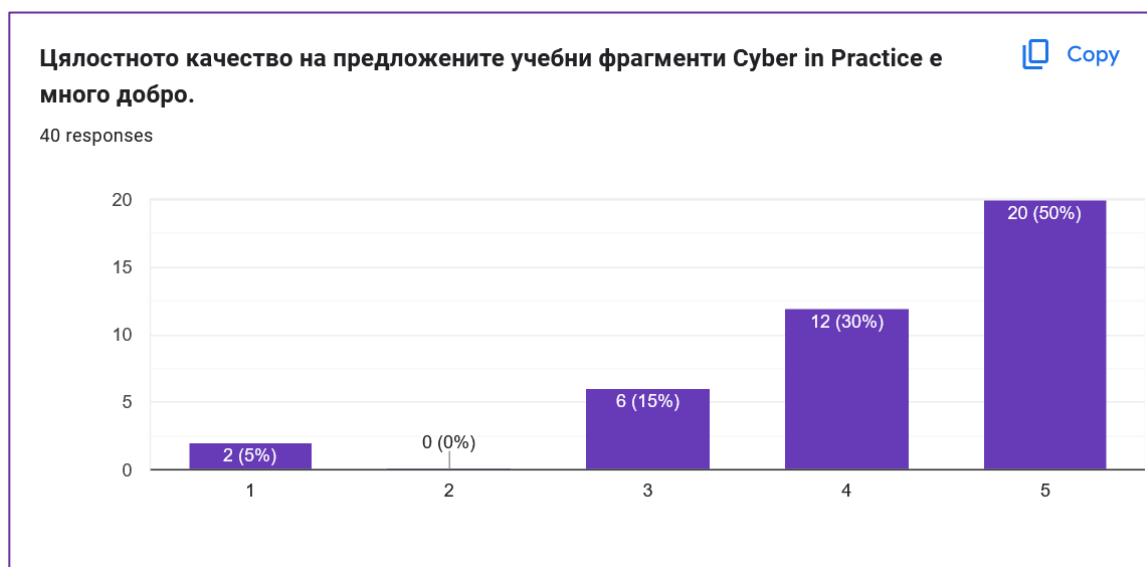
The questions designed to receive opinions on the overall quality of the aims, approaches and process of production of the learning fragments are included in Section 4. It contains 6 questions, type Multiple choice. Four of the questions use 5-degree scale, the other 2 questions use 4-degree scale for evaluation. The questions are structured as positive statements, the extent of which must be assessed.

To the first question: **The overall quality of the Cyber in Practice learning fragments is very good.**, 50% (20) of the respondents strongly agree the overall quality of the observed learning video fragments, 30% (12) agree the statement (see Figure 3).

It can be asserted that the overwhelming majority of respondents (80%) rate the overall quality of Cyber in Practice learning fragments as very good. Only two people (5%) strongly disagree with this statement. These two negative responses were given by the invited external respondents. On the one hand, they did not participate in the training in which the learning

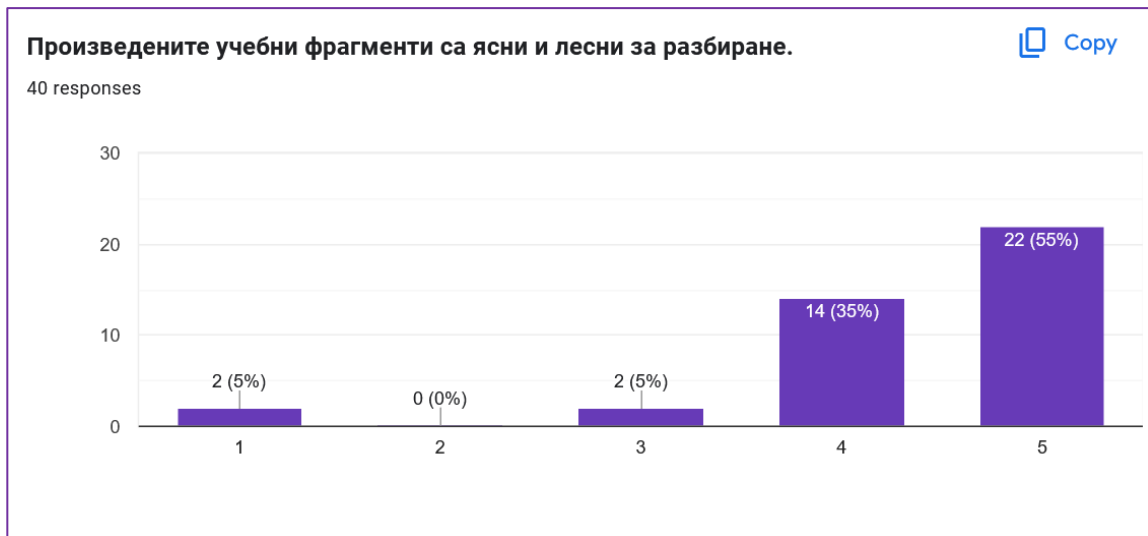


fragments were embedded. These fragments are detached from the general context of the learning topic in the particular lecture. On the other hand, these two respondents work in high-tech companies, where cyber security training is at a much higher level of development and conditioned by the specific nature of the work in the company.



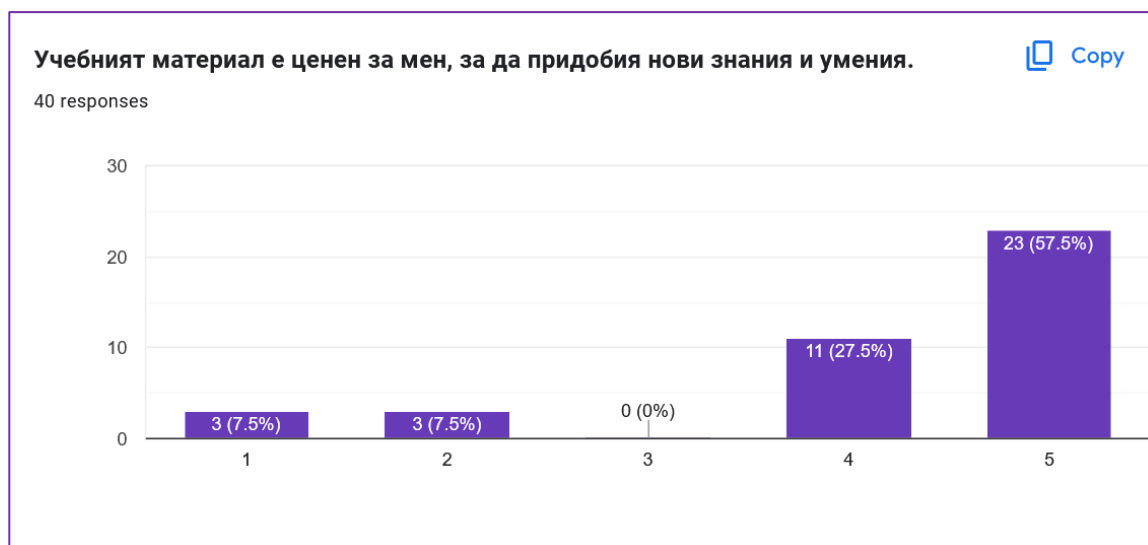
**Figure 3: The overall quality of the Cyber in Practice learning fragments is very good.**

The second question in this section (see Figure 4) seeks to reveal the level of clarity/comprehensibility of the message of the learning video fragment. The overwhelming majority of the respondents (55% strongly agree + 35% agree) felt that the observed learning fragments were clearly worded and easy to understand. Two of the respondents can not define their position and 2 two respondents found the video fragments unclear and difficult to understand. Later in the open-ended question, they justify the fact that most fragments are dominated by text instead of more dynamism and interactivity. Another of the respondents was motivated by the fact that there is too much specific terminology in the fragments that is unfamiliar even to experienced nonIT specialists.



**Figure 4:** The learning fragments produced are clear and easy to understand.

The third question (see Figure 5) aims to reveal how much the learning video fragments contribute to the acquisition of new knowledge and skills in the field of cyber security. Here again, the majority of respondents (34 out of 40) found that the created educational video clips were useful for them to gain new knowledge and skills. However, 6 respondents (15%) believe that the learning fragments did not enrich them with new knowledge. It can be assumed that this is because their training level is quite higher and they are already familiar with the cyber security issues addressed in these nuggets.



**Figure 5:** The study material is valuable for me to acquire new knowledge and skills.

The fourth question (see Figure 6) aims to explore the opinion of the respondents regarding the acquisition of capabilities to choose the most appropriate approach to respond to a specific cyber attack. 36 (90%) of those surveyed fully agree that the video fragments give them ideas for the right approach in a critical situation of a cyber attack. One respondent found it difficult to determine what the contribution of the video fragment was, and two did not think that the learning video fragment gave them good strategies to deal with cyber attacks.



**Figure 6:** How valuable are the suggested learning fragments (nuggets) to you that help you acquire new knowledge and skills about cyber security and choose the best behaviour and possible actions to deal with cyber attacks?

The last question in this section (see Figure 7) aims to reveal whether the trainees have received certain competencies to deal with cyber attacks in their day-to-day tasks. There is some overlap in this question with the previous two questions. However, it is useful for confirming or refusing previous statements. Here again the approval of the formulated statement prevails: a total of 86% of the respondents find the presented learning fragments valuable. Three people found it difficult to rate and again three disagreed with the formulated statement.



**Figure 7:** How valuable are the learning fragments that help you gain the necessary competencies to deal with cyber attacks in your day-to-day tasks?

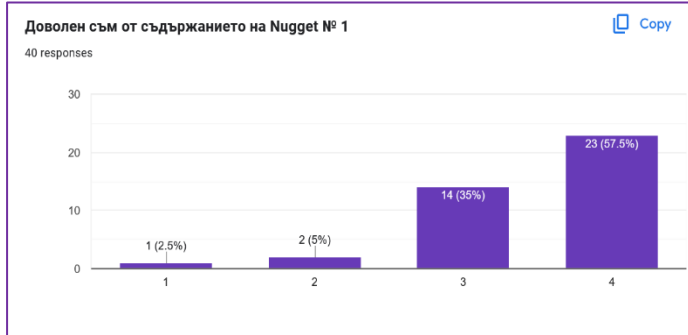
## Part 2: QUALITY OF THE LEARNING NUGGETS

### Section 5 of 6: Quality of the Learning Video Fragments

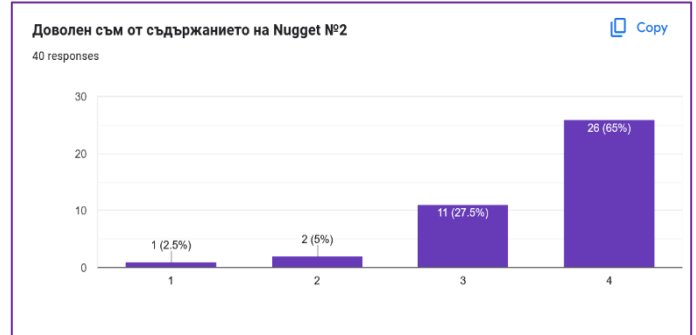
As it was mentioned above, the selected 10 video fragments were used in the training process and then they were incorporated in the online questionnaire in Section 3 of 6. The 10 observed video fragments are evaluated using 4-degree scale for each of them. The last question in this section requires an answer in free text.

Below the graphs of the separate video fragments show the results of their evaluation. As it can be seen, the majority of the respondents evaluated them as excellent and good. Only one respondent was negative to all video fragments (See the figures of the 10 learning fragments evaluated below).

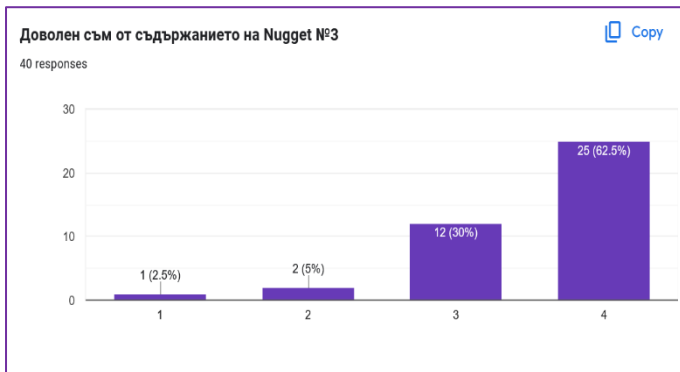
### Learning fragment (nugget) No 1: Love Story



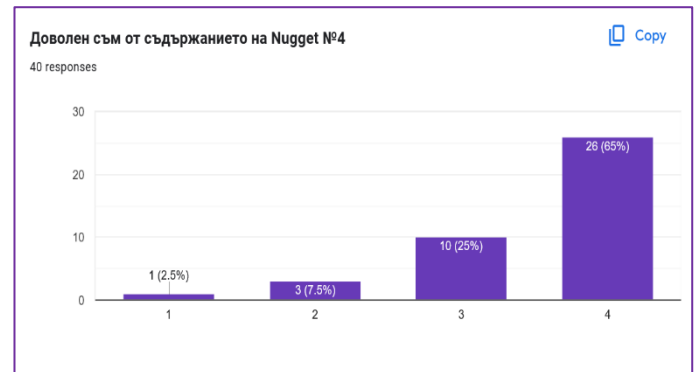
### Nugget No 2: Social Engineering Intro



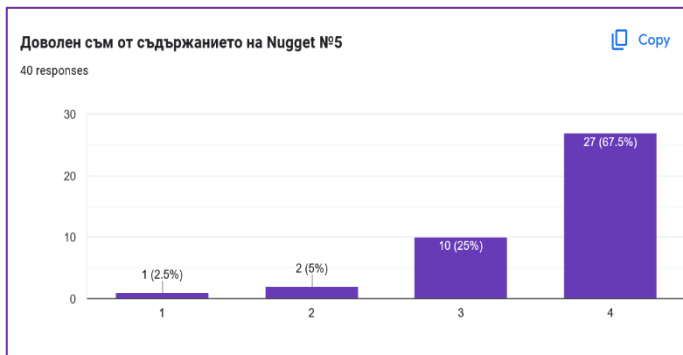
### No 3: Top 10 Emerging Cyber Security Threats (2023)



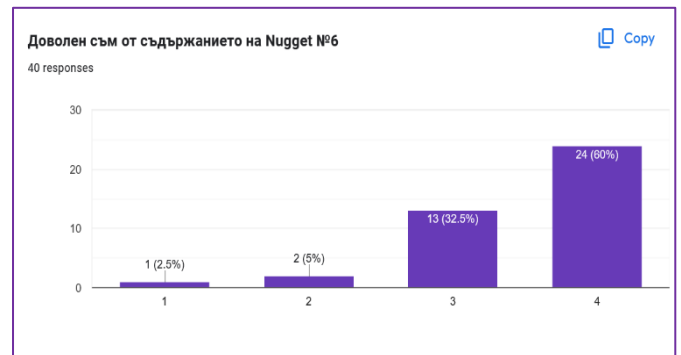
### No. 4: False Connection



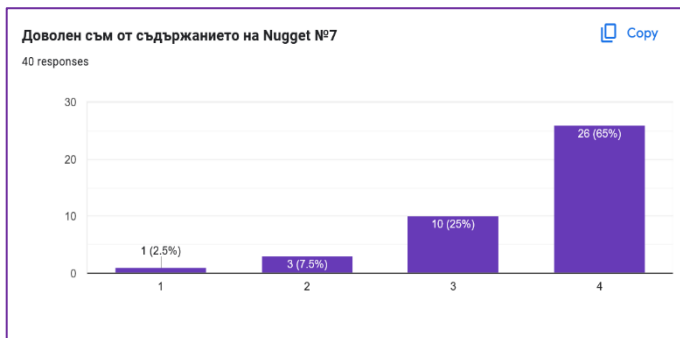
### No 5: Open Web Application Security Project (OWASP)



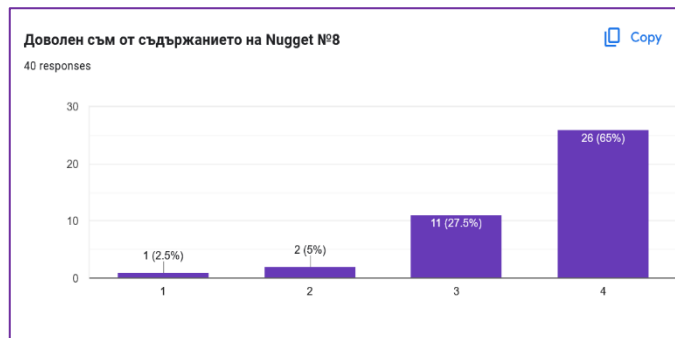
### No. 6: Do not Trust Emoted. The Case of Duisburg-Essen University, Germany



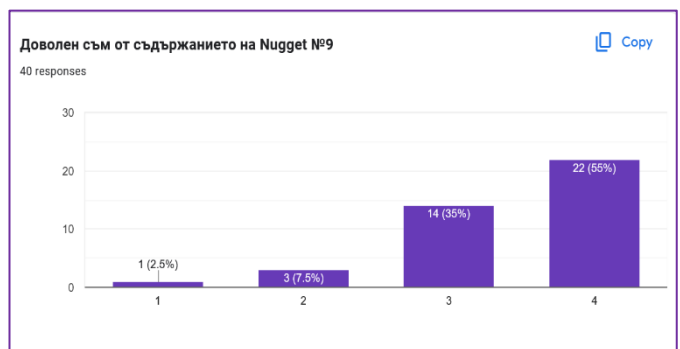
### No. 7: Cyber Attack at University Level



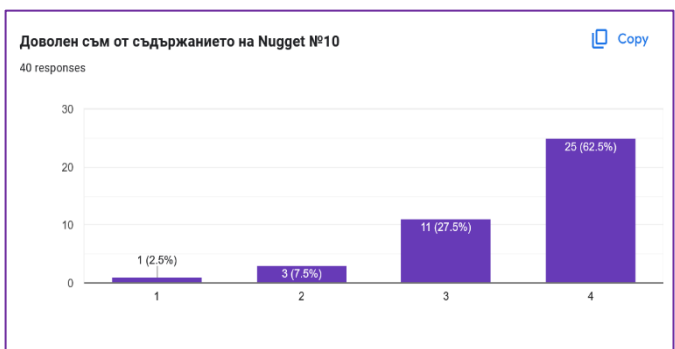
### No. 8: Be Aware - Connect with Care



### No 9: It is a Trap



### No 10: Cyber Bullying and Stalking



**Figure 8: Results from the evaluation of the learning video fragments No. 1 - No. 10**

The last question in this section requires an answer in free text to present perceived weaknesses and to give suggestions for improving the learning video fragments.

Although the overall evaluation of the qualities of the selected 10 learning video fragments is very high, the participants in the study also have their critical comments and suggestions for improving the video fragments.

Among the variety of critical remarks, the following can be summarised:

- Difficulties in perceiving the video material when it is not in the native language;

- Use of overly specific terminology for which there is no explanation in the nugget;
- Some animations are unnecessarily slow until you get to the point of the message;
- Some inconsistencies between the title of a video fragment and the content deployed in it;
- Some Spelling errors or bad English translation.

Also of interest are the suggestions made to improve the nuggets, for example:

- To create conditions for working in the native language (it can be done also by introducing subtitles);
- To introduce more dynamism, at the expense of text messages;
- The introduction of sound would improve the impact of the animations;
- In addition to methods to protect against cyber attacks, to mention experts, institutions, responsible units from which to ask for help or to be informed.

Below are all the answers to the open question:

**Q: Please state in free text WHAT could be changed/improved regarding the content of the learning elements?**

- Video fragments are perceived much better if they are translated into the native language
- Too complex terminology, unfamiliar to the general user not well-formed English translation too fast changing slides on some of the slides the text is illegible extremely unprofessionally designed slides and clips with a lot of text, poor readability, cursor scrolling during the slide, almost no interactivity.
- The ratio between theory and practice is a little too much in favor of theory. Any knowledge is valuable in principle, but there doesn't seem to be enough concrete practical advice. Example: there are (if quite simple) skills and practices for spotting certain simpler cyber scams that would be more useful to any Internet user than paying special attention to what they do at OWASP.
- The animated videos were mostly quite distracting for me personally. Example: watching the little hand draw first the decor, then the little guy, then the little guy's dialogue bubble, so that the content (which actually matters the most) can finally appear is a little too much for me. The idea of putting in a video/animation instead of everything being plain text to read is a good one. The execution itself could be a bit more efficient.



- For nugget 8 specifically, it seems to me that two of the three assessment questions were not particularly relevant to the specific information presented in the nugget in question.
- The title slide of nugget 10 says that in this nugget I will learn to identify cyberbullying and types of stalking. In my opinion, neither one nor the other happened. The plus side is that it rather successfully sensitizes potential parents to what could happen to their children online and to take their concerns seriously if they want to sound "too trendy."
- Spelling errors appeared here and there.
- Adding sound and subtitles
- I have no suggestions, everything was comprehensive
- It is better to have more dynamism and interactivity instead of more text.
- Can be done interactively with a selection of options. And then have a quiz to see what was understood.
- Maybe if there is a short text introduction of what will be learned in the corresponding video
- At the moment it is updated to a good level, with continuous updates it will improve even more over time
- As a tip, I can give you to stick to the interactive parts and the questionnaires after the explanations.
- Automatically go through the steps
- There is no
- Despite the large number of embedded photographic and interactive material, more can be added at the expense of "dry text", which is difficult to perceive by users far from the scope of the course.
- I'm a technical person and prefer more technically oriented content, but considering this is aimed at people with a non-technical background, the course is really very well done.
- I personally do not find things in need of change. I think the format is easy to understand, I don't think it needs improvements or changes.
- The only thing I can share is if our material can be provided in a similar way. Everything looks great.
- Nugget #4 is not very readable
- Improvement: In addition to sharing methods to detect relevant attacks, it would be useful to share people, institutions, etc. in order to enrich/contribute to the methods of protection.

- Materials look good. They are comprehensive and clear. There is nothing to irritate and confuse.
- I find them accessible
- No need for additional content
- In my opinion, the content is relevant and very well presented in an interesting way to be understood by the mass user, the questions after the end of the learning elements are useful to reinforce what has been learned. As an improvement, it would be good to make extensions to the learning elements for more knowledgeable users.
- The content is presented easily and comprehensibly. I don't think there's anything to add
- Video fragments are sometimes difficult to understand in English. It would be easier if they were translated into Bulgarian. In some of the fragments there is too much text and no interactivity.
- There is no
- There are some unreadable visuals. Maybe bigger font and highlighting the important stuff.
- Be colorful and animated
- I found them to be accurate, clear and easy to understand. I wouldn't change a thing.
- In my opinion, there is nothing to change
- The drawing style of the pictures is relatively slow, the information is too much at times (split into more parts?)
- Add background sound. If it's just as a presentation, at least it should be in full screen mode and switch with keys while recording the video. The animations of several nuggets were unnecessarily slow and unattractive.

### Part 3: QUALITY OF e-LEARNING PLATFORM

#### Section 6 of 6: Quality of the e-Learning Platform

The last section in the questionnaire is dedicated to the qualities of the Cyber IN Practice Moodle platform created within the framework of this project.

It contains a total of 4 questions, 3 of which require evaluation on a 5-degree scale. The fourth question requires free text to explain opinion and give recommendations for improvement.

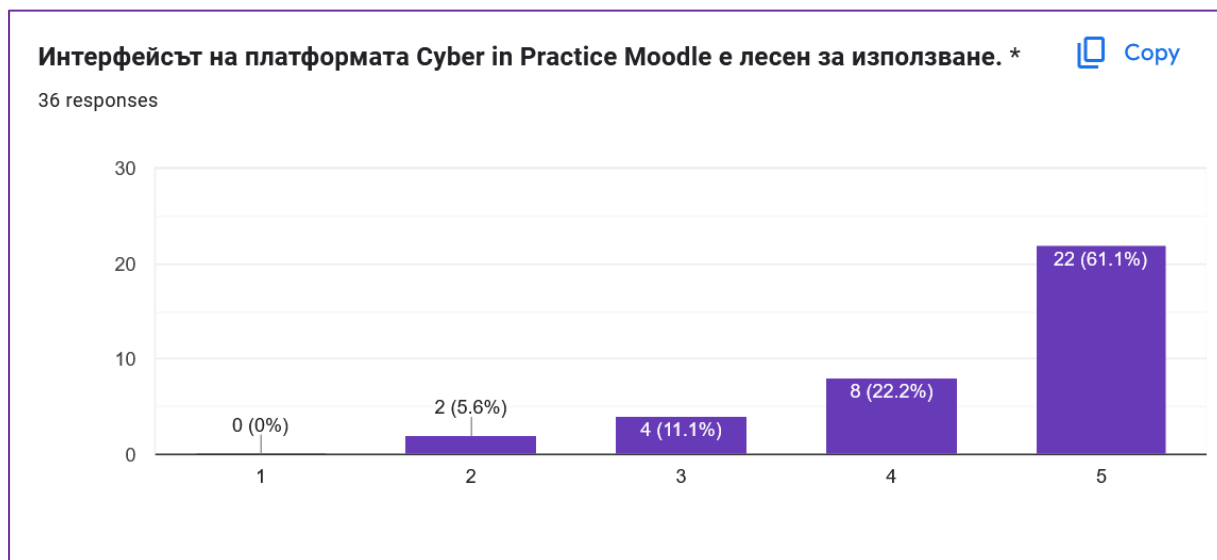
This group of questions was answered by 36 out of the 40 respondents. Since the external specialists invited to participate in the study did not have the opportunity to work in the Moodle platform and in order to prevent confusion on their part, a clarification was included in the instruction text that this set of questions only applies to people who have worked in this environment (see instruction below).

*The questions in this section are completed only by those who have worked on the proposed learning materials in the Cyber in Practice Moodle environment.*

**Instruction**

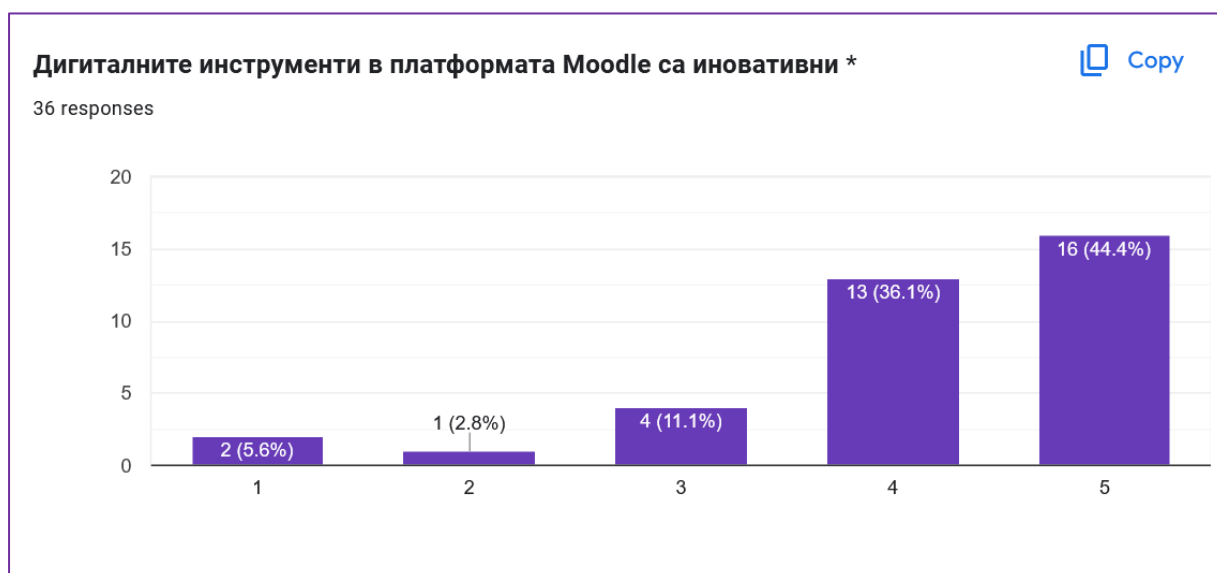
*Please look at the structure of the Cyber in Practice Micro Education page and answer the questions below by ticking the best option that reflects your opinion on the given statements by choosing the appropriate number: (1 - strongly disagree; 2 - no I agree; 3 – undecided; 4 – I agree; 5 – I completely agree)*

The first question seeks an assessment of the platform's interface in terms of its ease of use (see Figure 9). Here too, the ratios remain similar to the results in the previous questions. More than 83% of respondents give a positive assessment of the ease of working in the created platform based on Moodle. Only two respondents do not think that the platform is easy to navigate, and four (11%) find it difficult to define.



**Figure 9: The Cyber in Practice Moodle platform interface is easy to use**

The evaluation of the innovativeness of the platform (Figure 10) is slightly different: 29 people (80.5%) believe that the platform has innovative components, 3 people (8.4%) do not see innovation in the platform and 4 people (11.1%) make it difficult to assess.



**Figure 10: The digital tools in the Moodle platform are innovative**

The third question seeks to find out the degree of satisfaction with the amount of digital learning material (see Figure 11). Here again, more than 80% of respondents are satisfied with the amount of published learning video fragments (44.4% - completely agree and 36.1% - agree). 8.4% - do not approve the amount of learning materials, and 11.1% of respondents find it difficult to define their opinion.



**Figure 11: The amount of digital learning material is sufficient**

As in the previous sections, the open-ended question aims to get respondents' opinion on whether the platform meets their needs. The question also encourages sharing suggestions for future improvements. Among the proposals made, the following can be summarised:

- The variety of cyber attacks is great, so the platform can be enriched with more similar materials;
- There are no instructional texts for working in the platform;
- Better structuring of individual material blocks is needed;
- The module interface needs to be improved;
- Colour accentuation is generally lacking;
- A new look is needed with easy to find menus. There is room for improvement.

Below is a complete list of the proposals made by the respondents.

**Q: Please indicate whether the Cyber in Practice Moodle platform meets your needs. Write in free text what could be changed or improved in the Moodle platform?**

- The variety of cyber attacks is really great and it is good to have more such educational video clips to gain knowledge and skills.

- extremely unsatisfactorily arranged material, lacks interactivity, as well as accessibility for a wider audience.
- A more accurate schedule with tasks and their deadlines.
- Obviously, the platform is at the beginning of its construction. Instructional texts for working in the platform are missing. She is still too poor in materials to work with. A good start has been made, but much needs to be built on
- More icons to have
- Very convenient and easy to use. The content is very useful and easy to learn!
- In case I had no idea how to protect myself from cyber attacks Cyber in Practice Moodle would meet my needs
- No
- The platform is easy to use
- The module interface can certainly be improved. It looks a little dated right now, but that's a criticism of the platform, not the specific course.
- Improved navigation
- Without the use of accent colours it exudes a sense of simplicity and purity in design, very monochrome like most blogs with educational content. Colour accentuation is generally lacking.
- The platform is intuitive to use, I have left an average innovation rating because the functionality overlaps with Google's toolset, the amount of digital learning material depends on the level of the user.
- A new look is needed with easy to find menus. There is room for improvement.
- Everything published on the platform is useful. More materials on cyber security are needed. It will be good to have more exercises on cyber security topics
- It will be good to have more exercises on cyber security topics
- When I see it I will be able to appreciate it
- I wouldn't change a thing
- In the Moodle platform, everything meets my needs exactly

#### Part 4: GENERAL EVALUATION

The Bulgarian Questionnaire is structured in 6 sections.

The first three sections serve the purposes of the substantive questions, so to speak. Section 1 – introduces the essence of the study undertaken, Section 2 collects data on the professional

status of the respondents; Section 3 presents the selected 10 learning video fragments that participated in the pilot training process and which will then be evaluated.

The actual part of the questionnaire is placed in sections 4, 5 and 6. Total of 21 questions are defined and they are distributed in 3 thematic groups, based on 3 important criteria, namely: Overall Quality of the aims, approaches and process of nuggets development (6 questions) ; Quality of Cyber in Practice Learning Nuggets content (11 questions); Quality of Cyber in Practice Moodle e-Learning Platform (4 questions).

In addition to the main target groups, namely the university community in the form of students, teachers and university administration, the Bulgarian team decided to include a small reference group of external specialists. They were tasked with evaluating the produced learning video fragments by themselves, that is, taken out of the context of the educational content taught during the pilot trainings carried out in the period of September – December 2023.

Against the background of the generally positive assessment for all three selected criteria, part of the group of external respondents gave a low assessment of the quality of the studied learning fragments. The reasons for this can be sought in several directions: On the one hand, the external respondents consider the nuggets detached from the learning environment for which they were created and it is difficult to assess their significance in the specific learning context. On the other hand, the created nuggets are intended for initial training of students from non-IT majors, i.e. those who do not have sufficiently high knowledge and skills in the field of information technology and related cyber attacks. At the same time, the external respondents are working people in companies with a tradition of building cyber security systems for their activities. Therefore, the nuggets created fail to meet their higher expectations.

## Conclusions

As it is defined in the project proposal through the Feedback Questionnaire, the degree of achievement of the main goal must be checked – to develop training modules containing nuggets based portions of cybersecurity and risk management knowledge. The designed nuggets have a dual purpose: From one side, the nuggets support the academic staff for facing possible cyber threats and manage risks when offering remote lessons and exams. From another, the selected university teachers/trainers, teaching non IT disciplines, will use them to

incorporate small learning fragments (nuggets) of cybersecurity and risk management knowledge into the content of the relevant non IT discipline they teach for giving this knowledge to students.

Again, we have to emphasise that, in accordance with the project's goals, the nuggets provide basic knowledge about various high-frequency cyber attacks that affect all information technology users in their daily lives.

From this point of view, the following **CONCLUSIONS** can be made:

- The learning video fragments created cover all the important basic aspects of cyber security. Within the framework of the project, 69 such nuggets were produced and prerequisites were created for the production of new ones and enrichment of the arsenal of similar educational materials;
- Their duration of only a few minutes allows their successful integration into any educational content from non-IT scientific disciplines;
- A very important didactic component is the questions to verify what was learned from each video fragment. This trend should be saved when producing new nuggets;
- Although the Cyber IN Practice Moodle platform is at an early stage of development, it is a reliable toolkit that stores a large amount of such educational video fragments that can be used both in teaching a variety of scientific disciplines and to study in the independent work of all students;
- Conditions have been created for these learning video fragments to be used independently not only by students and teachers, but also by external stakeholders.

Based on the received recommendations, it can be summarised that in the further improvement and enrichment of the repository of educational video materials, the following **SUGGESTIONS** should be considered:

- To seek more interactivity when creating new nuggets;
- To reduce the preponderance of textual information at the expense of more dynamism, colour and graphics when presenting the specific cyber security case study;
- The developed video fragments should be in the native language of the users, or when foreign materials are used, translations with subtitles or voiceover in the native language should be introduced;
- Due to the short duration of the video fragment, it is very important that the main messages are grammatically correct and clearly formulated, and in such a way that they can be unequivocal understood by all users;



- Avoid overlap between the title and the statement of the nugget, and between them and the review questions at the end of each nugget.
- Given that the nuggets are intended for basic training of non-IT students, when specific terminology is used, look for ways to explain its meaning.
- To improve the work in the platform, it would be good to have instructional texts to support the work with the individual blocks in it;
- More work can be done on improving the menu system in the platform.

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## PILOT-TESTING RESULTS IN POLAND

### Introduction

This document serves as a comprehensive report detailing the outcomes of the Polish pilot test conducted as part of our project. It not only outlines the methodologies employed and the findings obtained but also extracts valuable recommendations derived from the feedback questionnaire specifically designed for this purpose. To ensure consistency and facilitate cross-country comparisons, identical questionnaires were prepared in the national languages of all participating partner countries.

Participants were guaranteed complete anonymity, thereby enabling us to draw broad conclusions from the feedback received, which can subsequently be applied to evaluate the effectiveness of the training materials across the participating nations. The pilot study, which engaged 30 student participants from Poland (representing Warsaw and Opole Universities), involved a structured presentation elucidating the project's objectives and outcomes. This was followed by a comprehensive demonstration of the learning materials and platform by our Polish partners, culminating in participant-led exploration of the platform and its associated materials.

Subsequently, participants were invited to provide their feedback through a specially crafted Google form questionnaire. This tool was meticulously designed to evaluate both the quality of the learning materials and the user-friendliness of the platform. Comprising various sections, the questionnaire aimed to gauge overall satisfaction, assess the efficacy of individual learning

components, evaluate the functionality of the e-learning platform, and solicit general feedback. To ensure clarity and facilitate accurate responses, each section was prefaced with clear instructions guiding respondents through the survey questions and available options. Through a combination of multiple-choice and open-ended queries, we endeavored to capture nuanced perspectives and insights from the participants, thereby enriching our understanding of their experiences.

## Pilot Testing Evaluation

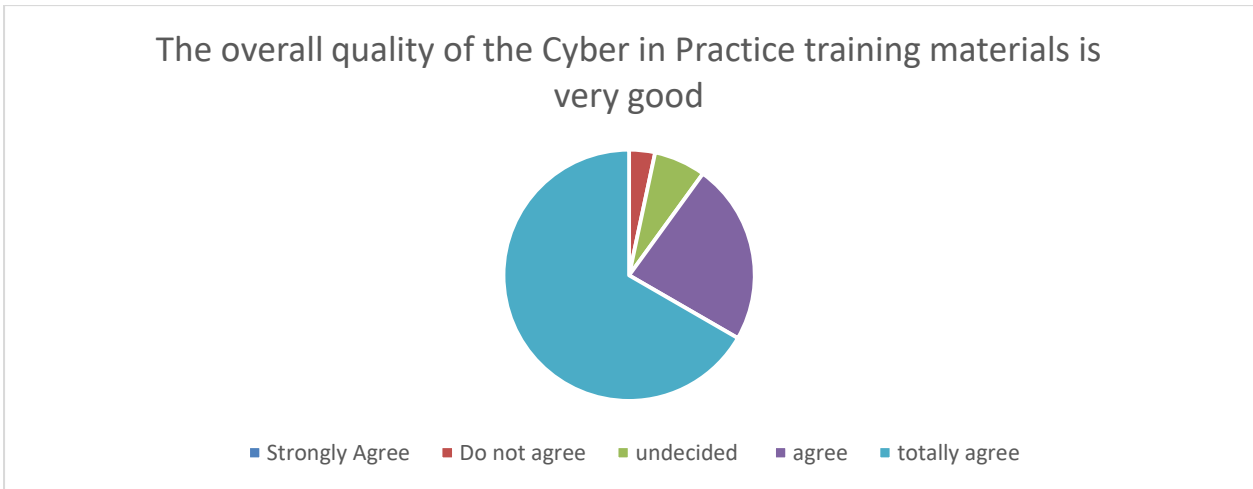
After an introductory question about the respondent profile, the questionnaire is structured in 4 main sections, namely:

- Section 1: Overall quality of the results;
- Section 2: Quality of the Learning Nuggets;
- Section 3: Quality of the E-Learning Platform
- Section 4: General Evaluation

All participants in the Polish pilot study are students.

### Part 1: OVERALL QUALITY

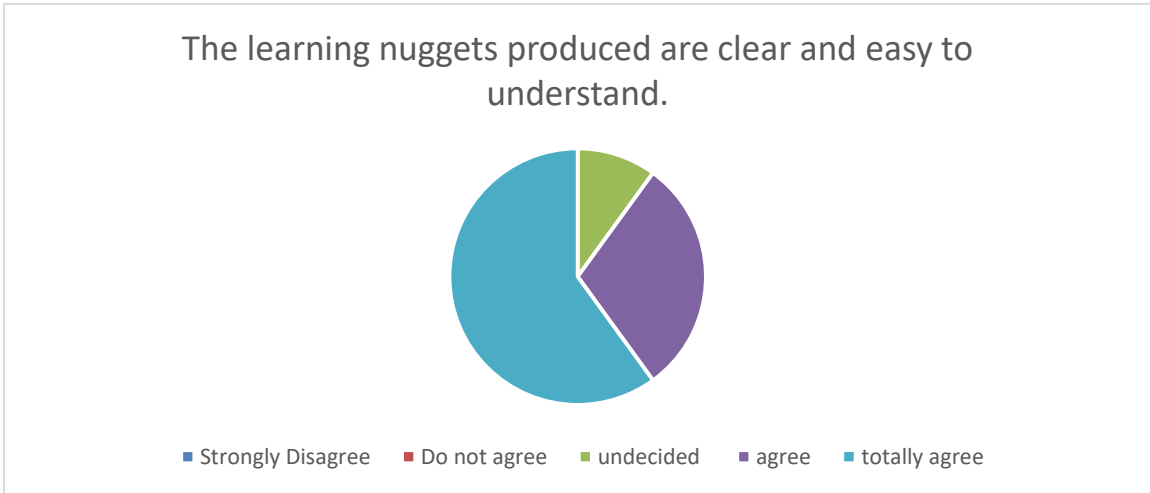
According to the responses, it was determined that the platform and the learning nuggets prepared were very rich and useful in terms of content and quality, and that they were considered by the respondents to be worth using in the future. The distribution of the 30 different results obtained is shown in the graph below:



In addition to the survey results obtained, two participants who wanted to give additional opinions made the following comments:

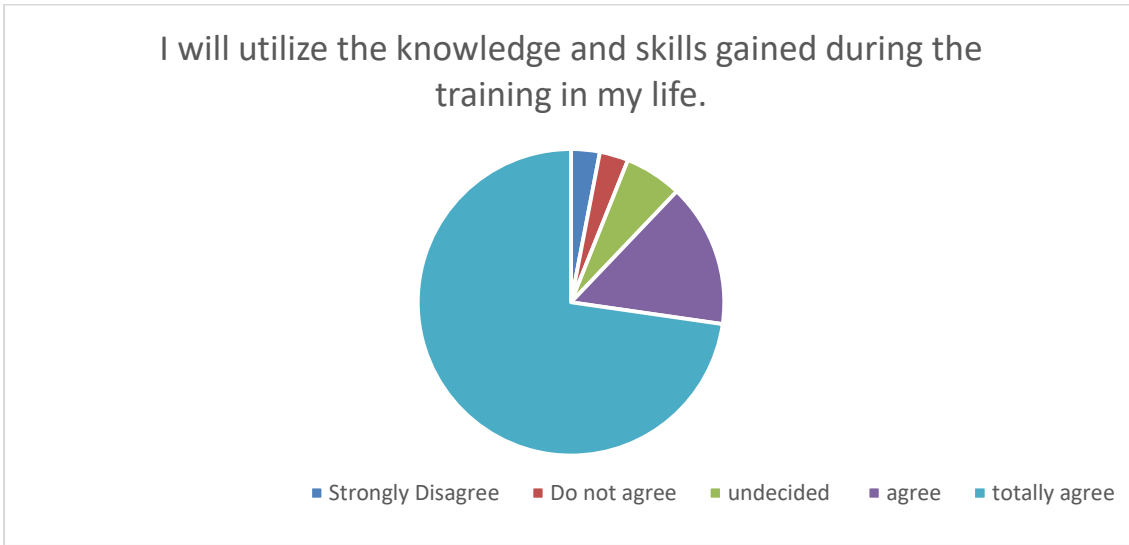
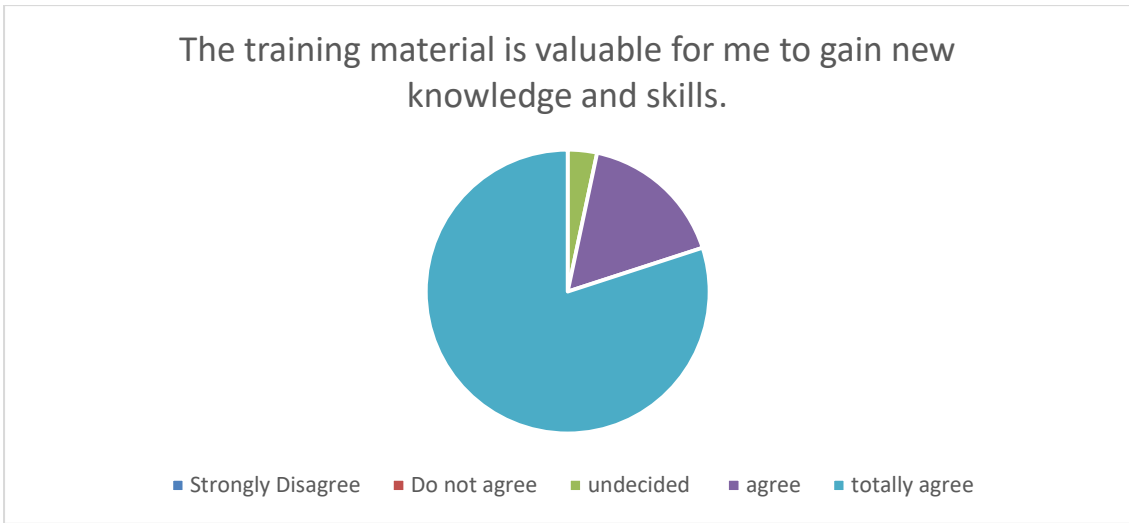
*“Everything was good.”*

*“The content of nuggets are brief and very well explained.”*



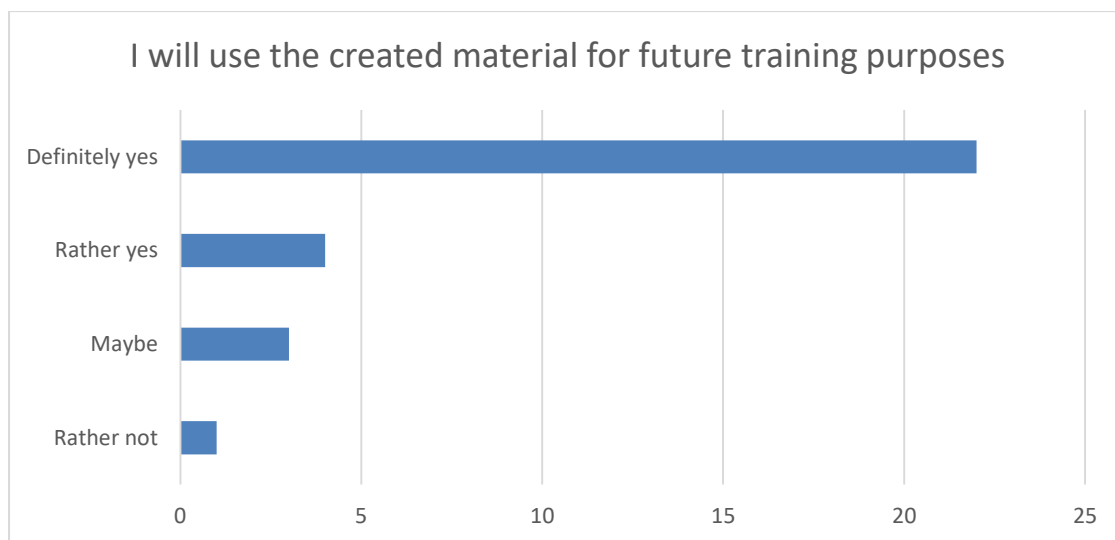
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## Part 2: QUALITY OF THE LEARNING NUGGETS

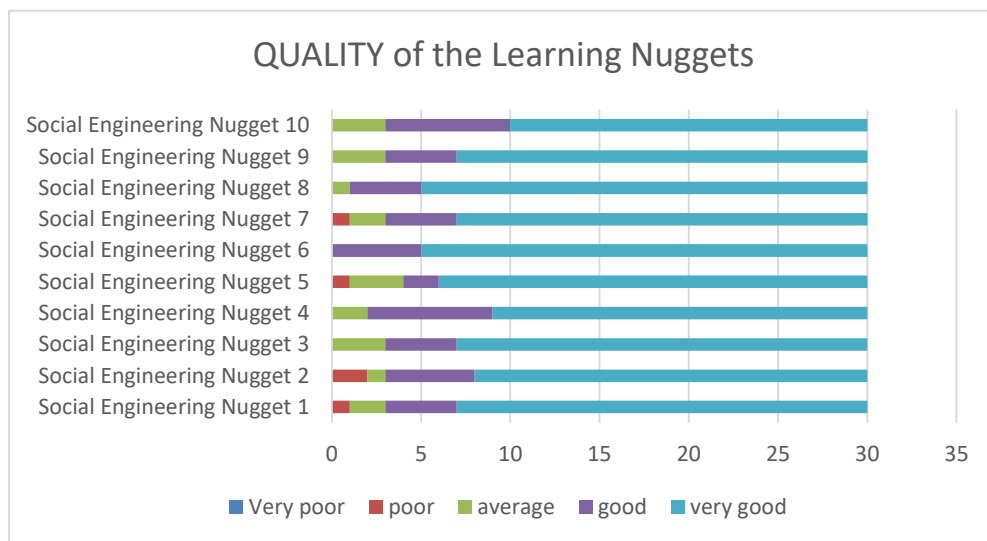
In this section, we meticulously evaluate learning nuggets across seven distinct areas, each subject to a separate analysis. By scrutinizing each nugget within its respective area, we gain a multifaceted perspective that enhances our understanding of the efficacy and relevance of the training material.

Each learning nugget is assessed against predetermined criteria, meticulously examining its alignment with the overarching learning objectives and its effectiveness in delivering key concepts. Furthermore, we consider factors such as engagement level, clarity of presentation, and relevance to real-world scenarios. Through this granular evaluation process, we aim to identify areas of strength and opportunities for improvement, thereby informing future iterations of the training material.

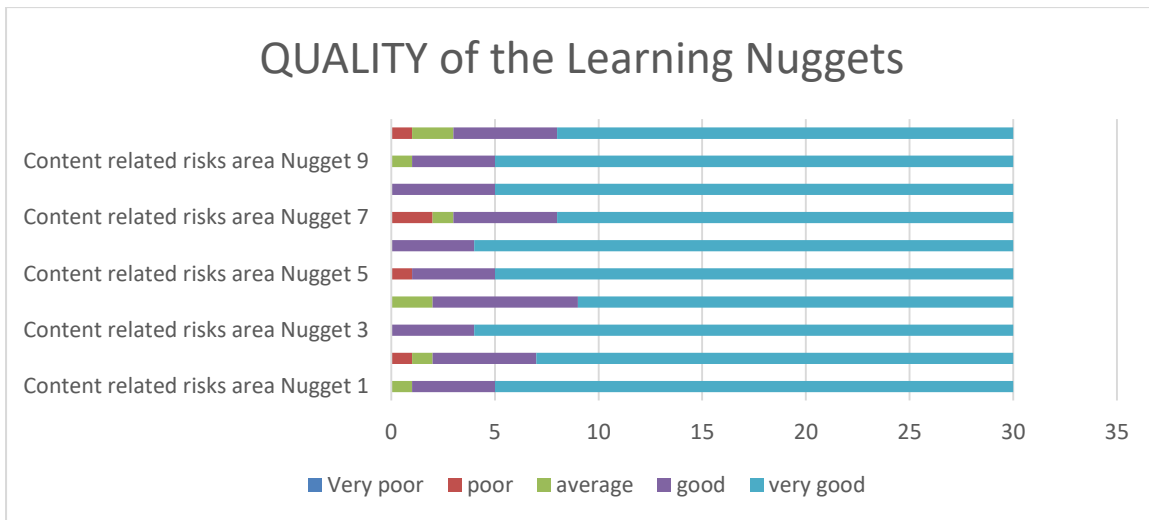
Additionally, by evaluating learning nuggets within distinct thematic areas, we gain insights into the coherence and comprehensiveness of the overall curriculum. This holistic approach enables us to discern patterns and trends across different subject domains, facilitating targeted interventions where necessary.

Ultimately, this detailed evaluation of learning nuggets in various thematic areas serves as a cornerstone for continuous improvement and refinement of the training material. By leveraging both internal and external perspectives, we strive to create a learning experience that is engaging, effective, and responsive to the needs of our participants.

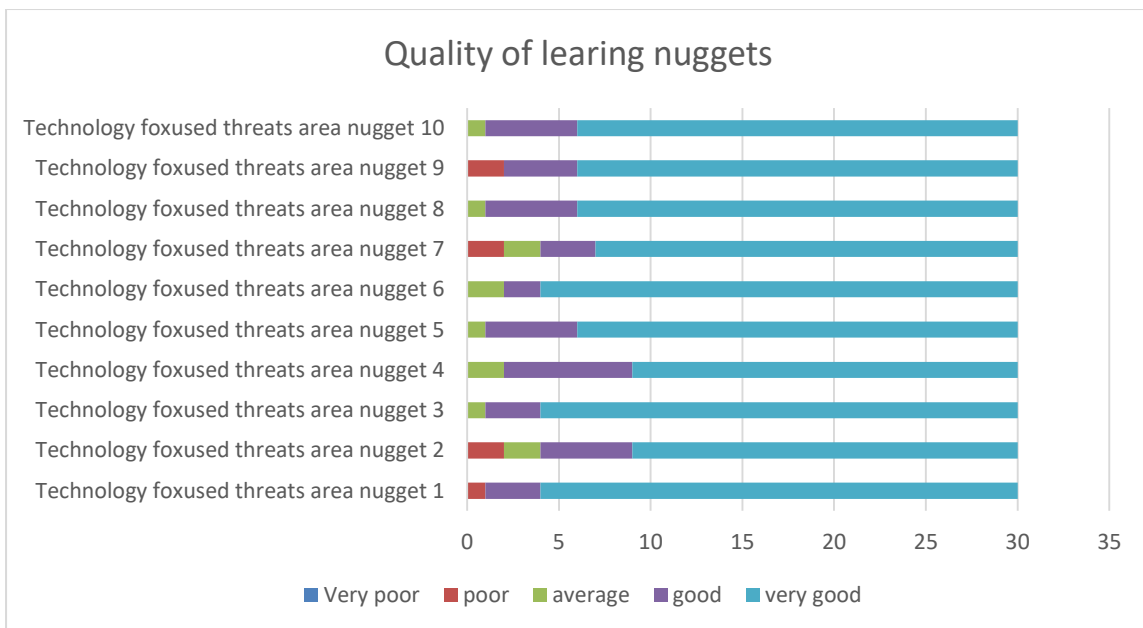
The survey results regarding the nugget evaluations related to the Social Engineering Area are as shown in the graph below:



The results of the survey on nugget evaluations related to content related risks are as in the graph below:



The results of the survey on nugget evaluations related to technology focused risks are as in the graph below:

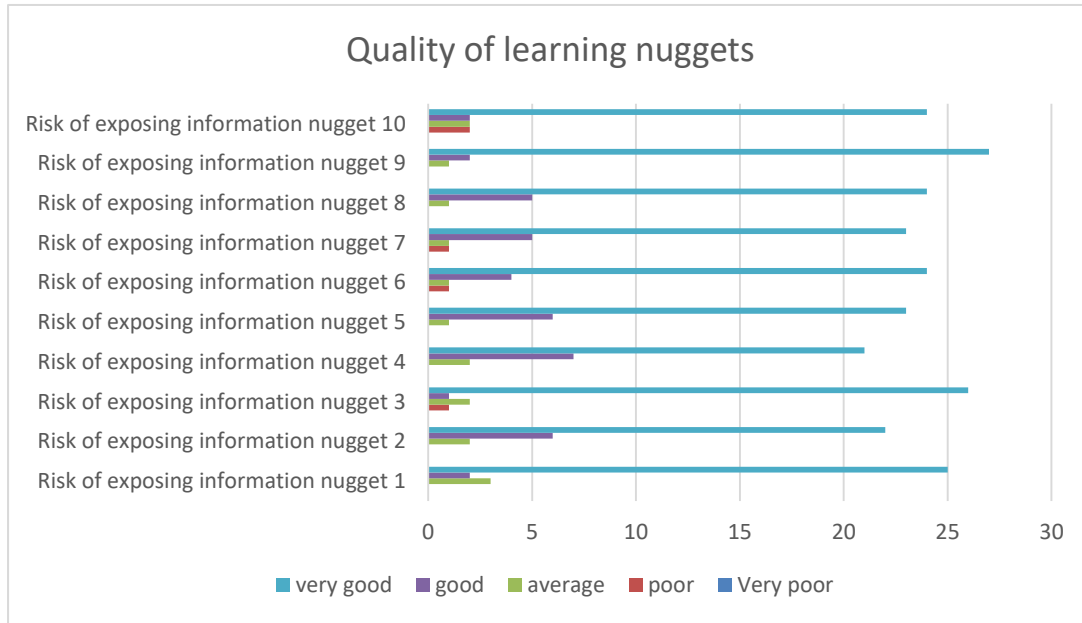


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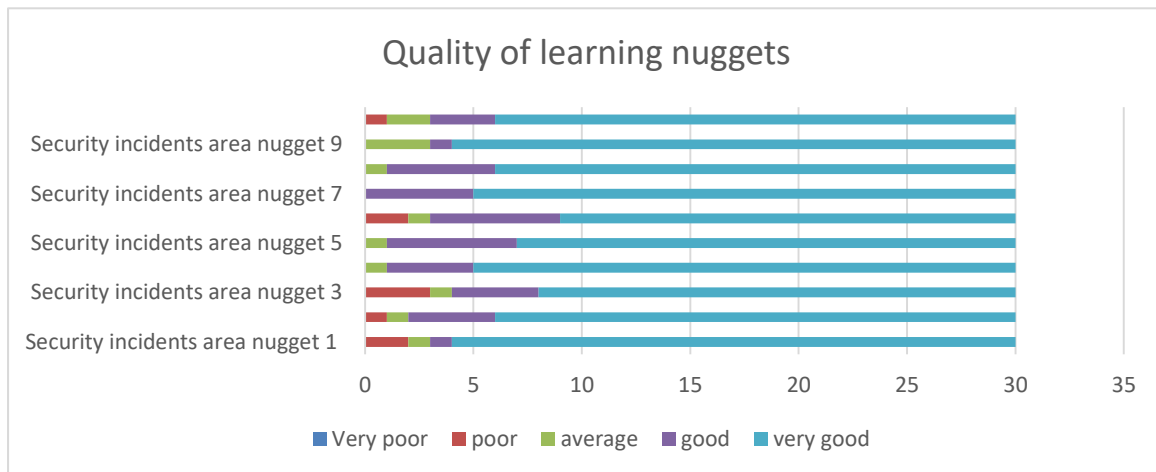
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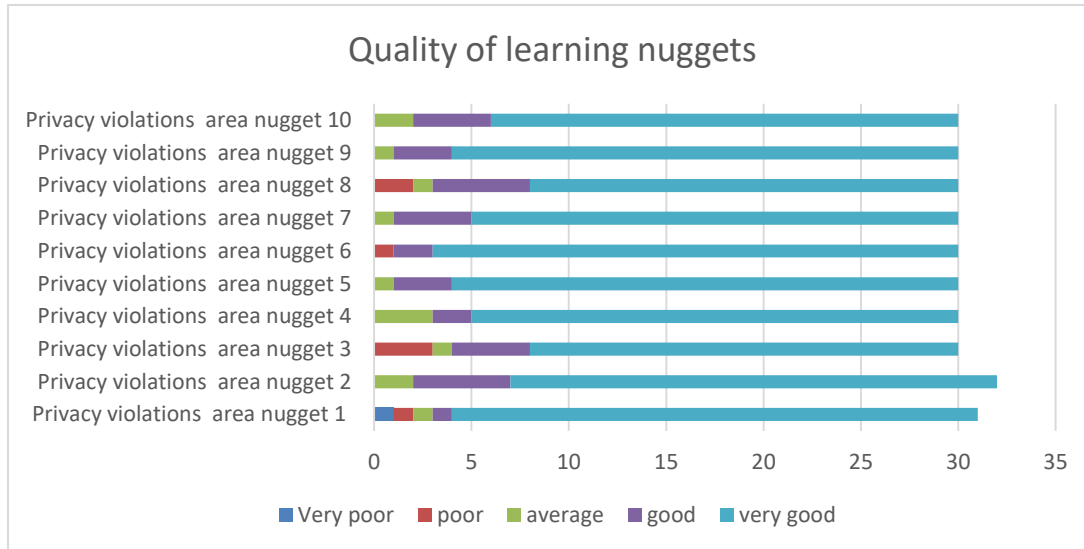
The survey results regarding the nugget evaluations on the risk of exposing information are as in the graph below:



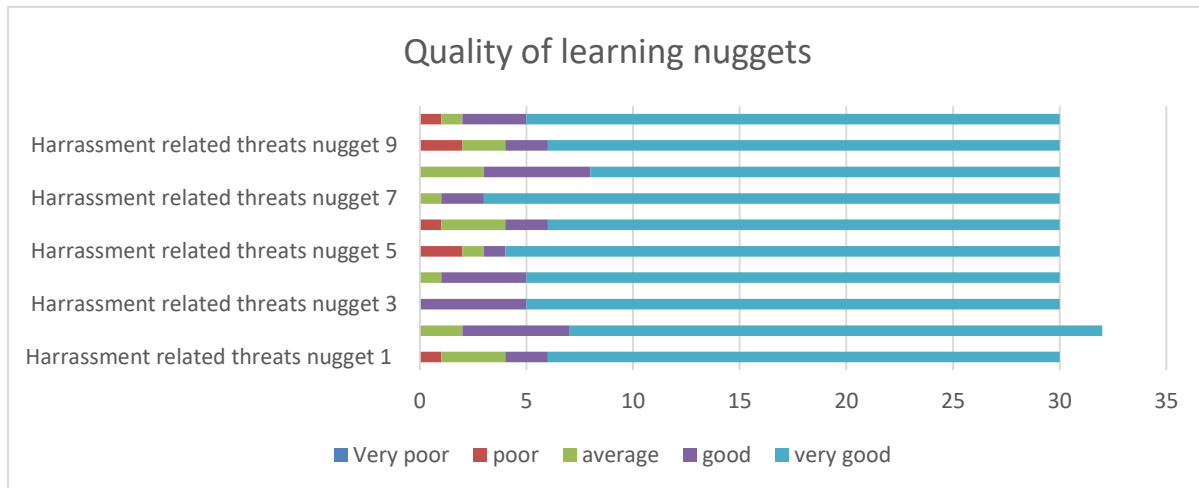
The results of the survey on nugget evaluations related to security incidents are as in the graph below:



The results of the survey on nugget evaluations related to privacy violations are as in the graph below:



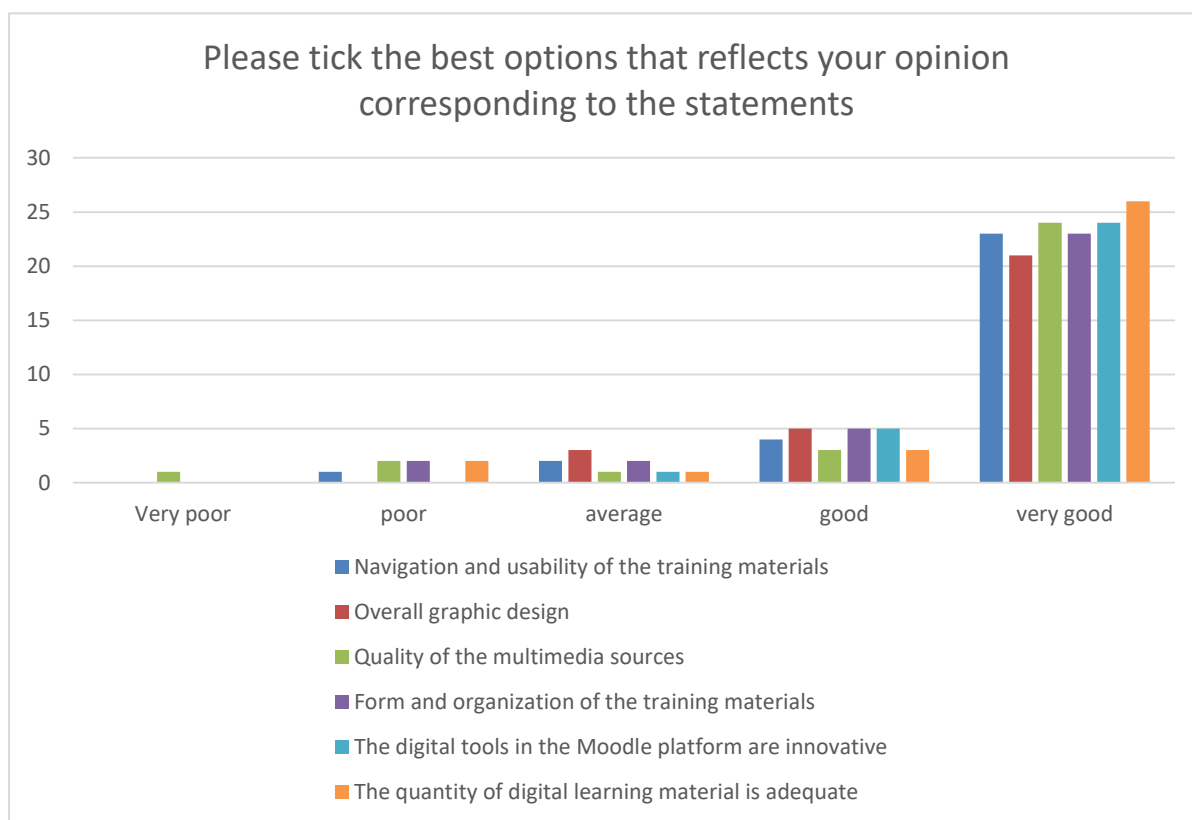
The results of the survey on nugget evaluations related to harassment related risks are as in the graph below:



### Part 3: QUALITY OF e-LEARNING PLATFORM

In the following section, we present the assessments and feedback provided by users regarding the e-learning platform. Within this context, users have expressed positive sentiments regarding various aspects of the platform, including its interface, visual design, multimedia quality, and the innovative nature of digital tools incorporated.

To provide a visual representation of these findings, we have included graphs depicting the results obtained below:



## Part 4: GENERAL EVALUATION

After evaluating the content and interface of the learning nuggets and the e-platform, participants were encouraged to provide overall feedback and personal observations. Their comments are as follows:

"The learning nuggets are well-prepared and provide good learning xperience

"They raise important issue of cybersecurity in higher education sector."

"Innovative educational materials and the dissemination of important project findings help advance cybersecurity education."

"Enhanced collaboration among partners contributes to addressing cybersecurity challenges through mutual knowledge sharing."

Regarding the shortcomings of the learning nuggets, the feedback included:

"Nuggets might be boring as some topics are repeated"

"Some scenarios are overly artificial and might not be encountered by the non-IT students.."

"The learning nuggets could be more interactive to better engage students and hold their interest."

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## PILOT-TESTING RESULTS IN SWITZERLAND

### Introduction

This report aims to present and analyse the results gained from the implementation of the Swiss pilot testing (Result 3, Task 3 “Conducting Pilot Testing in Partner Countries”), organized according to the testing methodology developed by Training2000 (R23/A4). The report summarizes the procedure, the results, and the recommendations emerged during the testing experience, collected through a “feedback questionnaire”. The same questionnaire, translated in national languages, was used in the different countries to get comparable results. The questionnaire is anonymous and the data collected are used to draw general conclusions across partner countries and improve the training material developed within the project.

The pilot testing was carried out in Switzerland from December 2023 to February 2024. A total of 23 participants took part in the study. The procedure followed during the test consists of the following steps: introduction to the project objectives and results, and presentation of the learning nuggets and platform by the Swiss partner to the participants; autonomous navigation through the platform and nuggets, and familiarization with all the learning material by participants; answer to the feedback questionnaire by participants.

The feedback questionnaire, created using Google form, aims to investigate the quality of the learning material, as well as the usability of the learning platform. It consists of different sections in order to evaluate the overall quality of results, the learning nuggets, the e-learning platform, and provide a general evaluation. The proposed questions are both multiple choice and open-ended. All questions are preceded by clear instructions to introduce the respondent to the meaning of the question, and explain the possible answer options.

### Pilot Testing Evaluation

After an introductory question about the respondent profile, the questionnaire is structured in 4 main sections, namely:

- Section 1: Overall quality of the results;
- Section 2: Quality of the Learning Nuggets;
- Section 3: Quality of the E-Learning Platform

- Section 4: General Evaluation

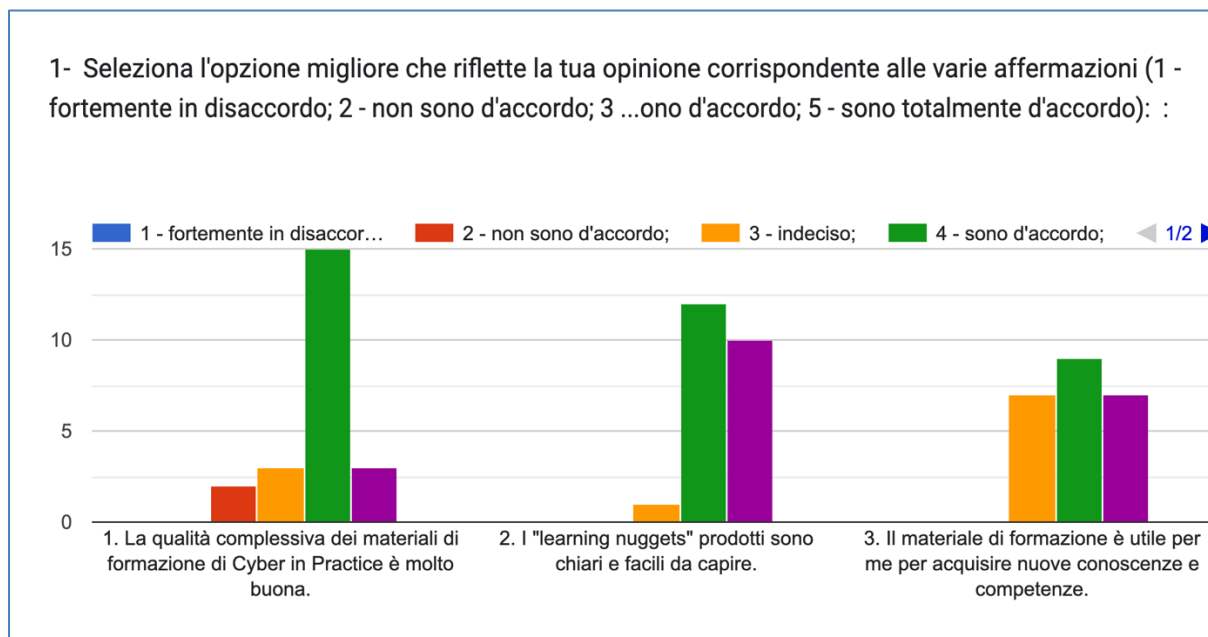
All participants in the Swiss pilot are students.

## Part 1: OVERALL QUALITY

The questions in this section are designed to get opinions on the overall quality of the Cyber In Practice training programme and the utility of the learning nuggets to acquire new competences. The questions are structured as positive statements on a 4-degree or 5-degree Likert scale.

About the first question “**The overall quality of the Cyber in Practice learning material is very good**”, it can be asserted that the majority of respondents (more than 78%) rate the overall quality of Cyber in Practice learning fragments as good or very good. Only few people (8%) strongly disagree with this statement (see Figure 1.1).

The second question aims to understand the **level of clarity** of the learning nuggets (see Figure 1.2). The overwhelming majority of the respondents (43% strongly agree, 52% agree) feel that the observed learning fragments are clear and easy to understand.



**Figure 1:** (1) The overall quality of the Cyber in Practice learning material is very good.  
(2) The learning nuggets are clear and easy to understand  
(3) The training material is useful for me to acquire new knowledge and skills

The third question (see Figure 1.3) aims to reveal how much the **learning nuggets** are considered **useful** to the acquisition of new knowledge and skills. Although the majority of respondents (about 70%) find that the created learning nuggets are useful for them to gain new knowledge and skills, a part of them (about 30%) believe that the learning fragments do not increase their knowledge a lot. This is probably because they are already familiar with some cyber security issues addressed in these nuggets.

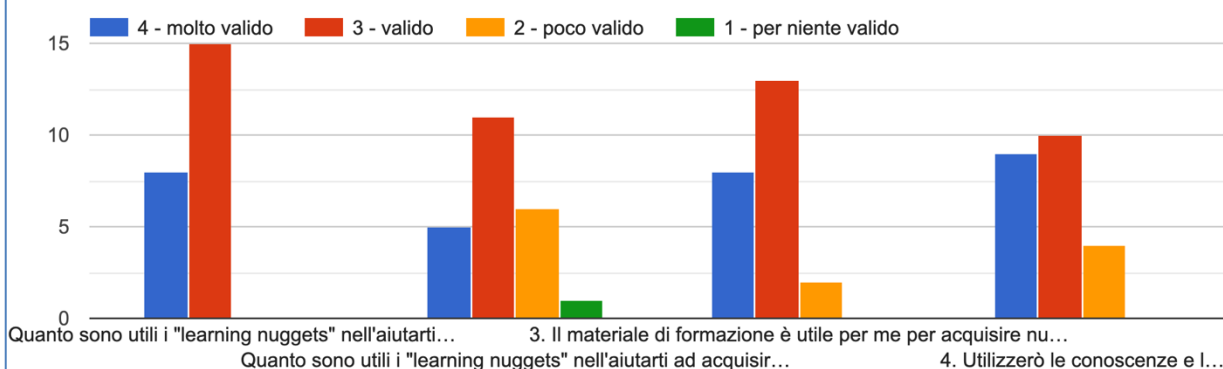
The fourth and fifth questions aim to explore the opinion of the respondents regarding the acquisition of new knowledge and competences on cyber-security, and to respond to cyber-attacks in their daily tasks. In this case we use a 4-degree Likert scale from “very valuable” to “not valuable”.

All the respondents believe that the learning nuggets are useful to increase their knowledge and competences on cyber-security (the answers are “valuable” or “very valuable”) (see Figure 2.1); a majority of them, about 70%, agree that the learning nuggets are useful to acquire new knowledge to respond to cyber-attacks (see Figure 2.2).

In the sixth and seventh questions participants are asked whether the training material is useful to gain new knowledge and skills (see Figure 2.3) and if they will use the knowledge and competences acquired during the training in their life (see Figure 2.4).

The majority of respondents (about 91%) believe that the training material is useful to gain new knowledge and competences and about 83% of the participants declare that they will use the acquired knowledge in the future. The overlapping in the last questions confirms that the major part of respondents find the presented learning fragments valuable.

2 - Seleziona l'opzione migliore che riflette la tua opinione corrispondente alle seguenti affermazioni  
(4 - molto valido, 3 - valido, 2 - poco valido, 1 - per niente valido)



**Figure 2:** (1) How useful are learning nuggets to gain new knowledge on cybersecurity  
(2) How useful are learning nuggets to acquire new knowledge to respond to cyber-attacks  
(3) the training material is useful to gain new knowledge and skills  
(4) use of knowledge and competences acquired during the training in their life

To complete this section an open-ended question has been added about what has worked well and what not. Hereafter a summary of the answers is reported:

- some videos did not play properly
- everything well done, simple and clear quizzes, clear and easy to understand concepts
- overall, the material is very good, useful and interesting
- provide more examples of non-certified sites
- the clarity and conciseness of the contents are a key element of this project
- a problem emerged in answering quiz 2 in nugget "the importance of being updated"; the nugget does not provide the information to answer the question; in the same nugget the button that should take back to the initial slide does not work; additionally, the path links in the last slide are not correct.



## Part 2: QUALITY OF THE LEARNING NUGGETS

The pilot testing was mainly based on the evaluation of about 40 learning nuggets belonging to 4 modules, which were also translated in Italian: “Social Engineering”, “Technology focused-threats”, “Security incidents”, “Privacy violations”. These are the nuggets were participants mainly focused their attention. However, some participants also explored the nuggets of the other 3 modules.

Each nugget was evaluated using a 4-degree scale. After the evaluation of the nuggets of a module, participants were asked to answer an open-ended question about perceived weaknesses and suggestions for improving the reviewed nuggets.

Below the graphs that report the evaluation of the learning nuggets, organized by modules, starting from the nuggets in Italian.

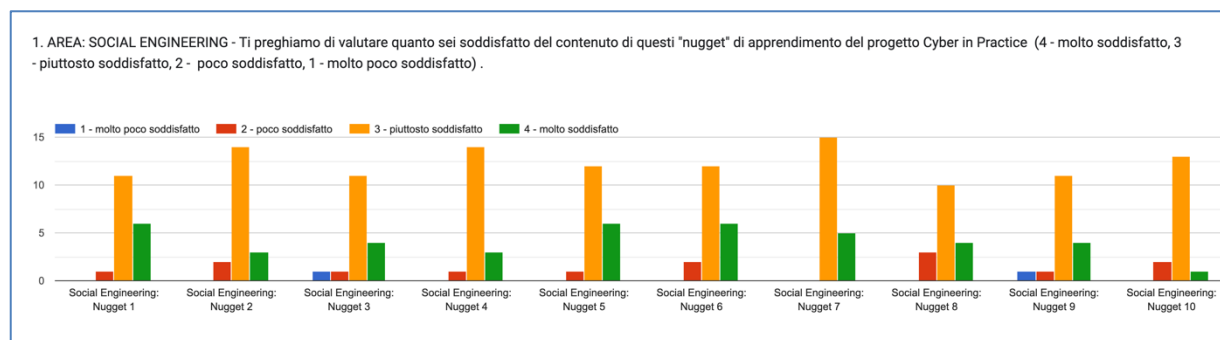


Figure 3: nuggets on Social Engineering

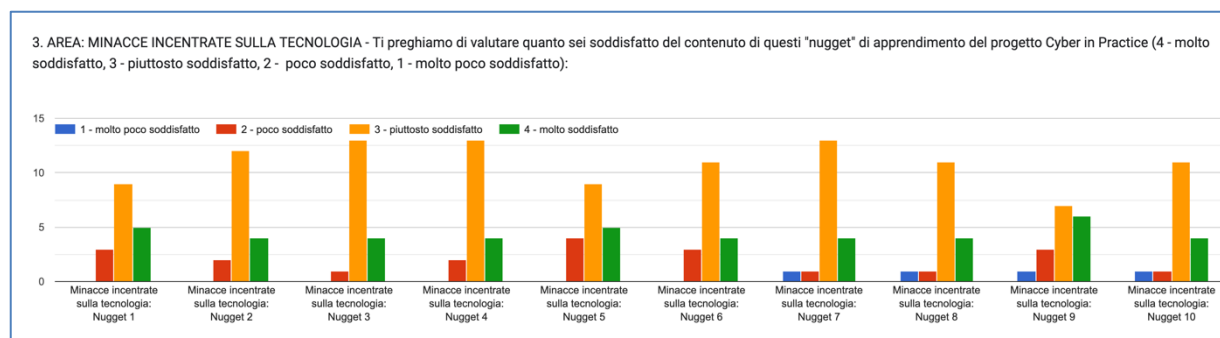


Figure 4: nuggets on Technology focused-threats

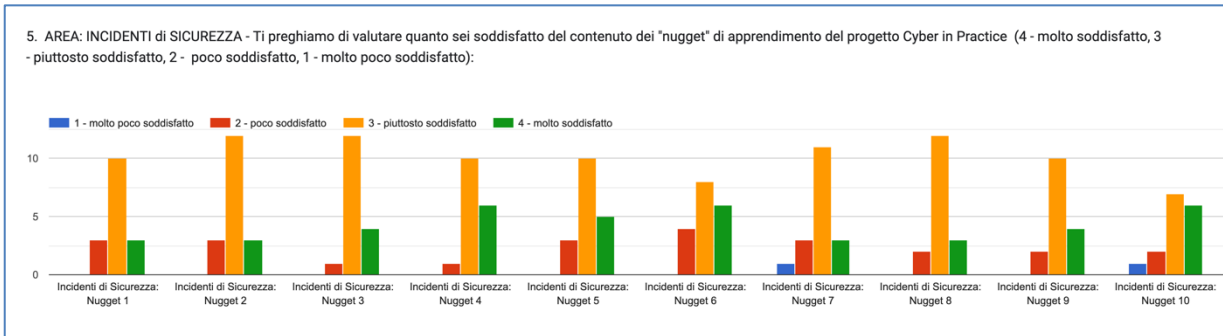


Figure 5: nuggets on Security incidents

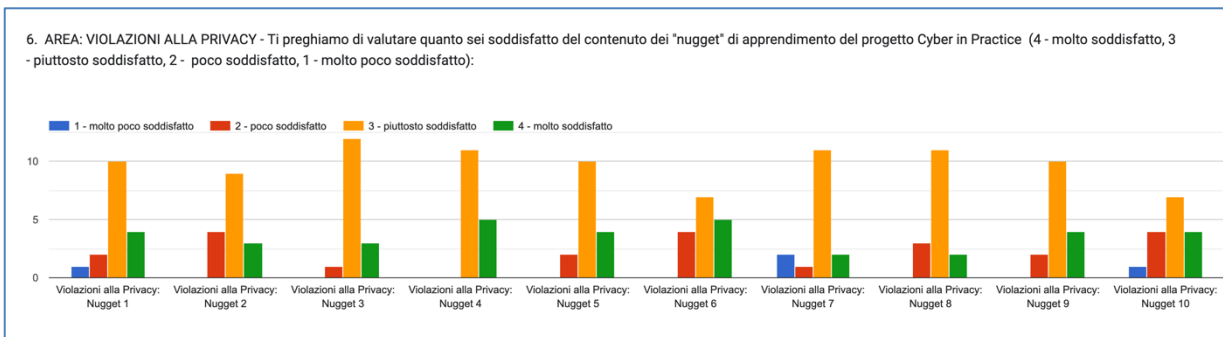


Figure 6: nuggets on Privacy violations

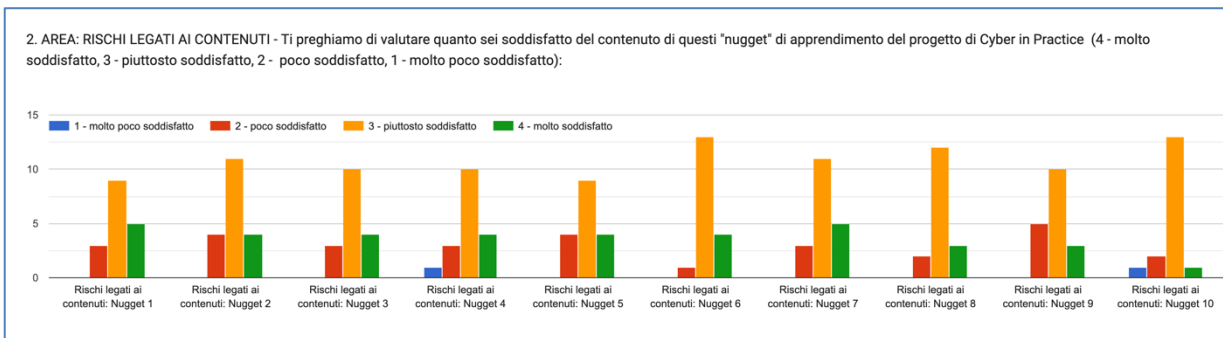


Figure 7: content related risks

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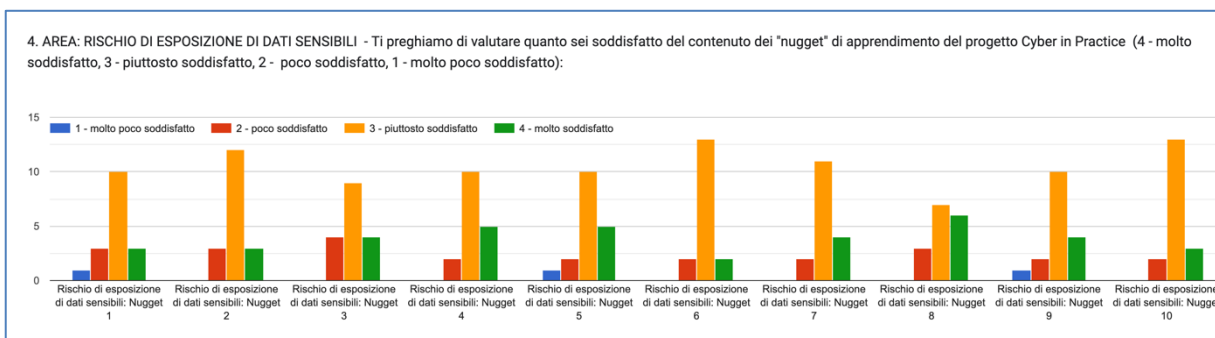


Figure 8: risks of exposing sensitive data

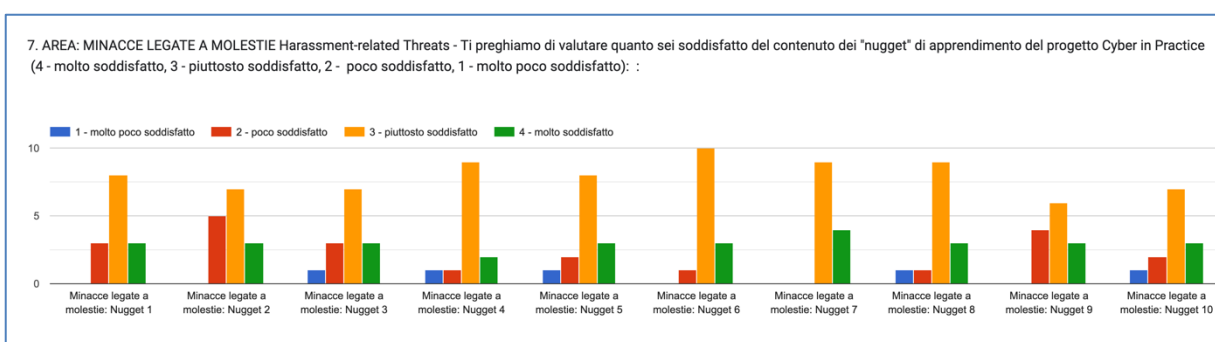


Figure 9: harassment-related threats

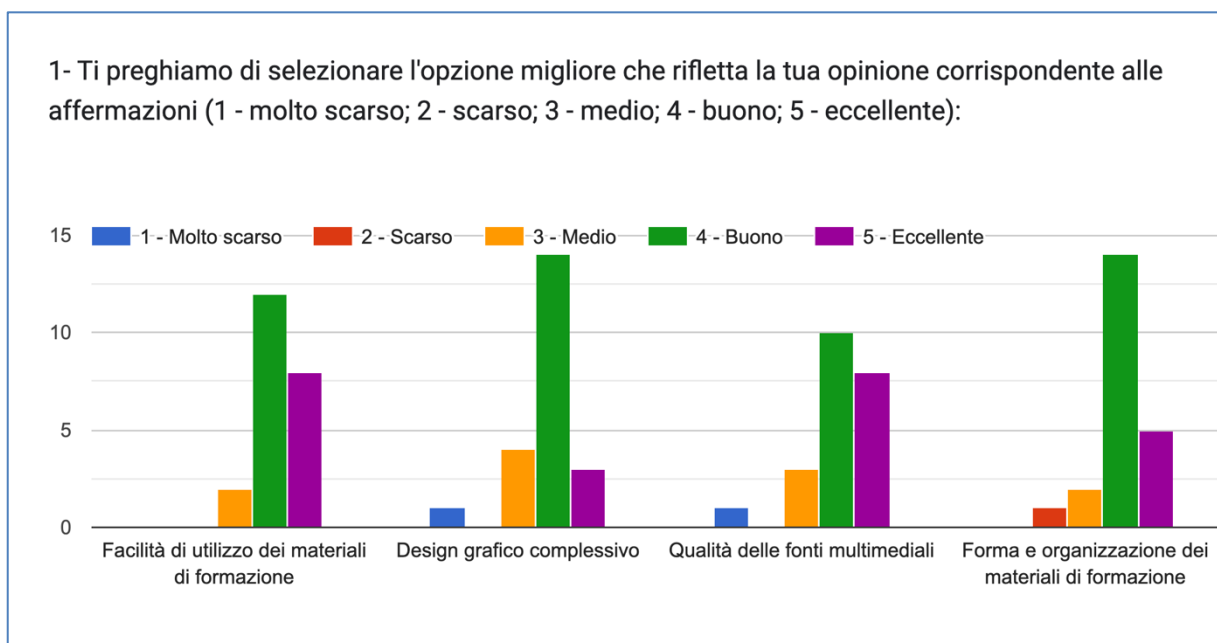
From an overall observation of the evaluation results, it can be seen that the majority of the respondents evaluate nuggets as good (yellow bar).

Although the overall evaluation of the quality of the learning nuggets is high, participants also provide some comments and suggestions for improvement. The main recommendations are deals with the need to address the reader towards the suggested path (path A, B and C) in an automatic way.

### Part 3: QUALITY OF e-LEARNING PLATFORM

The third section of the questionnaire is dedicated to the quality of the Cyber IN Practice e-learning platform, Moodle, created within the framework of this project.

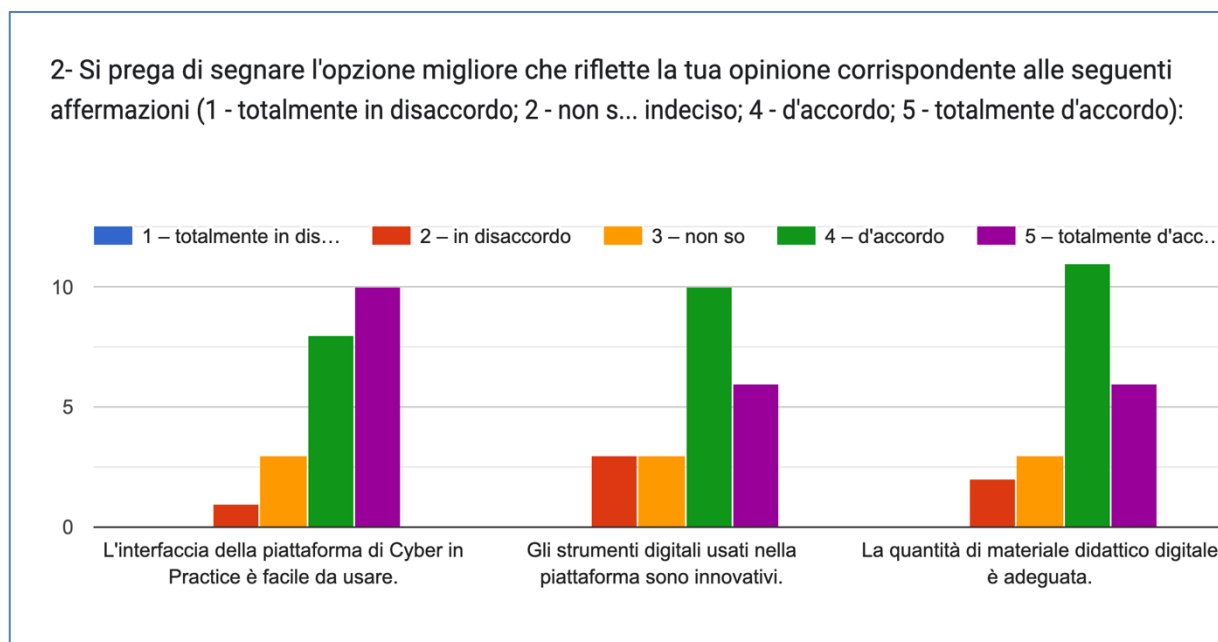
It starts with 4 questions on a 5-degree scale about the ease of use of the training material (see Figure 10.1), the overall graphic design (Figure 10.2), the quality of the multimedia sources (Figure 10.3), and the form and organization of training material (Figure 10.4). The majority of respondents rate good or excellent the ease of use of the training material. A positive assessment was also given to the graphic design, the quality of multimedia sources, mainly videos, and to the form and organization of the training material, considered good by most of the participants. Only few participants disagree with this general opinion.



**Figure 10:** (1) easy to use of the training material  
 (2) overall graphical design  
 (3) quality of the multimedia sources  
 (4) form and organization of training material

Then, another set of 3 questions is proposed on the same scale about the platform. The questions are about the ease of use of the platform interface (Figure 11.1), the innovativeness of the digital tools used in the platform (Figure 11.2), and amount of training material (Figure 11.3). The platform's interface is judged ease to use by the large majority of respondents, with a consistent part in complete accordance. The digital tools used in the platform are considered

quite innovative. The degree of satisfaction with the amount of digital learning material is generally high.



**Figure 11:** (1) the Cyber in Practice platform interface is easy to use  
 (2) the digital tools used in the platform are innovative  
 (3) the amount of training material is adequate

Some respondents highlight difficulties in adjusting the zoom, so the windows are too large and cut off some parts of the text.

#### Part 4: GENERAL EVALUATION

In this section respondents are asked to express their opinion about positive and negative aspects of the learning nuggets produced by the Cyber In Practice project team.

Among the positive aspects they mention:

- brevity, immediacy

- quick and concise
- simple and clear, concepts easy to understand
- very useful informative videos
- quizzes useful to keep the user attention

As weaknesses respondents identify:

- some technical problems playing videos
- quality of pop ups
- errors in the test answers
- some quizzes need revision: some of them are too obvious, other ambiguous

## Conclusions

From the pilot test it emerges that the Cyber In Practice Moodle platform and the learning nuggets are a valuable resource to provide knowledge and competences about cyber-security, and tools to respond to cyber-attacks and manage risks. The nuggets support the higher education staff in facing potential cyber threats and, at the same time, can be used as learning fragments to be integrated in other training courses of non-IT disciplines. The nuggets can also be used by students and any other stakeholder for an independent study.

In particular, respondents appreciated

- the short duration of the nuggets;
- the ease of the use of the learning platform and nuggets;
- the immediacy of the approach;
- the engaging and interactive nature of the nuggets, integrating quizzes and other gamification elements.

The pilot test was also useful to collect recommendations and feedback for improvements. The following suggestions should be considered:

- Check the correct playing of videos;
- Verify and correct the answers and feedback of quizzes;
- Make the path to follow after answering a quiz automatic (no need for the “path” slide at the end);
- Correct grammatical errors and check the content of pop-up text; in some cases, the text associated to “I” button is not the right one.



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In conclusion, the project results have been appreciated in spite of some revisions required to further improve the quality of the learning nuggets.



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