Erasmus+ KA2 - KA220-HED - Cooperation partnerships in higher education
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Cyber in Practice

"Cybersecurity in practice for non IT oriented HE courses"

Project

GUIDELINES FOR IMPLEMENTATION OF THE LEARNING NUGGETS WILL BE DEVELOPED FOR SUPPORTING THE WORK OF UNIVERSITY STAFF FOR HEIS

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Main Contents

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INTRODUCTION

R3/A1 - Guidelines for Implementation of the learning nuggets will be developed for supporting the work of university staff for HEIs is the Methodological framework for implementation of the learning modules containing nuggetsbased portions of cybersecurity and risk management knowledge.

Nowadays, every professional with higher education has, among other skills and responsibilities, the duty to have a strong awareness of the cyber security triad: threats, vulnerabilities, and risks. Basic knowledge of ICT processes, products, and services, of security threats mining fundamental aspects such as availability, integrity, confidentiality or authenticity of data while transmitted, processed or stored as well as the services based on these data and offered by business organisations (private bodies, SMEs, large industries or individuals).

The designed nuggets have a dual purpose: 1) the nuggets support the academic staff for facing possible cyber threats and manage risks when offering remote lessons and exams; 2) the selected university teachers/trainers, teaching non IT disciplines, will use them to incorporate small capsules (nuggets) of cybersecurity and risk management knowledge into the content of the relevant non IT discipline they teach for giving this knowledge to students.

Target groups of this Guidelines are the academic lecturers (future trainers) and non IT students.

Using of Learning Nuggets of IT knowledge in the content of non IT disciplines can: improve and enhance learning and retention; prepare people faster for new tasks; reduce the need for formal training courses and their associated costs; reduce support costs; increase productivity; increase the ease and agility of creating and maintaining learning materials.

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THE GUIDELINES MODEL

The Guidelines for Implementation of the learning nuggets will be developed for supporting the work of university staff for HEIs will cover all important aspects of cybersecurity to create the grounds for common use including a toolkit to be further used and adopted because when it comes to security and cybersecurity the countries have strict regulations, requirements, and strategies. The toolkit of elements and guidelines for implementation will overcome this barrier and provide "universal" instruments for use. The idea of this guideline is to introduce practical methods, methodological tools, and instruments for design, development, and use of: learning activities, tasks, and grading methods.

The methodology will contain:

1. Learning nuggets in HE: practices, approaches, lacks/gaps;

2. Syllabus;

3. Teaching and learning objectives;

4. Teaching/learning strategy;

5. Evaluation of the process and its results and lessons learned;

6. Grading system/scale;

7. Thesaurus/Glossary of terms;

8. Recommendations foreseen for integration of the training material(s) into the main content of the relevant disciplines (approaches and, tools to be used)

Learning nuggets in HE: practices, approaches, lacks/gaps

Microlearning is the overarching concept behind learning nuggets. As the word “micro” suggests, this is basically about all learning opportunities that force learning in small bites. Ideally, these morsels can be consumed regardless of time and location. This is intended to promote self-determined, independent learning. The best examples of the use of microlearning are apps that can be used to

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learn foreign languages. Small tasks like vocabulary queries, which can easily be done at the bus stop or during the coffee break, are the concrete learning nuggets in this case.

Such microlearning offerings are in tune with the times: decreasing attention spans, the widespread use of smartphones, and the constant need for learning on the part of generations Y and Z create the best conditions for learning with the help of small, adequately prepared morsels. And because we've just mentioned the generations that are currently flooding into the job market: When it comes to designing learning nuggets, there's a lot you can learn from the (social) media that Gen Y and Z consume on a daily basis.

Learning nuggets are small units of knowledge that together are part of a larger educational content. They are interconnected as they are part of a single lesson. They are usually short (5 minutes approximately) and the goal is to develop a concept that leads to another. Some examples are: videos, short quizzes or audio files.

Learning Nuggets are condensed, concise chunks of knowledge that are meant to be quickly absorbed and assimilated.

The duration of a Learning Nugget might range from a few phrases to a few minutes.

There are several ways to obtain Learning Nuggets, including internet resources, social media, mobile apps, and email newsletters.

With the help of learning nuggets, learners can learn flexibly and independently of work location or time. This guarantees that they will only engage with the content when they are ready and focused. This in turn leads to content being learned more intensively. In addition, learning nuggets are good for targeting e-learning motivators. Live feedback and small rewards after each task increase motivation and subsequently e-learning success. Furthermore, learning nuggets can be used to repeat what has already been learned on one's own responsibility.
At the same time, all of this results in the first major benefit for companies: The increased learning success of employees usually leads to better performance. But that's not all: Learning Nuggets can be quickly adapted to new circumstances due to their low complexity. With little effort, a new policy or product can be integrated into the e-learning offering. Once a company invests in es

Thus Learning Nuggets can be useful for learning since they are made to provide information in a clear and interesting manner, which makes it simpler for students to acquire and remember knowledge. For in-depth learning or the development of specific skills, they might not be adequate.

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Syllabus

The project partners have identified in R2 different areas of interests for the learning nuggets that became the main topics of the developed training material. The following table describes the areas, the nugget title, partner responsibility and number of the foreseen nuggets to be developed.

Areas	Nugget Titles	Responsibility	Number of Nuggets
Social Engineering	Recommendations on the use of emails	EDUVIBES	10
	Phishing examples and analysis of email phishing /pharming		
	Skimming		
	Vishing		
	Smishing		
Content related risks	Recognition of Fake news on digital media	ULSIT	10
Technology-focused threats	Hacked applications, update threats	Training2000 &SUPSI	10
	Hacked websites, how to check certificates and control Ips		
Risk of exposing information (also under technology if we considered Authentication/ authorization)	Steps for planning virtual thesis defense meeting (the main target group master and PhD students)	MSKU &MU	10
Security incidents	Institutional attacks	Training2000 &SUPSI	10
	Attacks against individuals		
Privacy violations	Institutional & Individual violations	MSKU &MU	10

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Harassment related threats	Cyber- bullying, cyber-stalking and other forms of unwanted contact	ULSIT	5

Teaching and learning objectives

Teaching and learning objectives *of* the Cyber In Practice **micro e-learning nuggets** are:

1) To provide information about Cyber In Practice in short, light forms for academic lecturers (future trainers) and non IT students;
2) To improve learning practices of cyber issues for staff if HEI.

Teaching/learning strategy

The strategy model is based on two main elements:

1. The Cyber In Practice training contents- **micro e-learning nuggets**
2. The use of interactive ICT tools/Moodle platform for training.

The contents will be provided in the form of online learning nuggets available on the Cyber in Practice Moodle Platform.

Each learning nugget is developed as follows:

1. **Introduction/use-case/infographic** presenting the learning objectives for developing specific competences
2. **Theory:** a short video or interactive presentation (3-5 minutes) as the nutshell of information, only the most important things
3. **Assessment quiz game**: A stand-alone resource to support performance ('just-in-time) evaluation.

Evaluation of the process and its results and lessons learned

The Training Nuggets and the Moodle platform' will be both subjected to pilot testings.

The Pilot testing will be carried out in each partner country for testing the Cyber IN Practice approach for incorporation of IT knowledge into the learning content of non IT disciplines.

The partners will conduct at least two sessions of the testing for each of the disciplines they have selected to work on among the 7 macro areas developed within the project. The partners adopted the rule of conducting **at least two sessions for each of the modules they have selected to work on among the following ones:**

1. *Social Engineering*
2. *Content related risks*
3. *Technology-focused threats*
4. *Risk of exposing information (also under technology if we considered Authentication/ authorization)*
5. *Security incidents*
6. *Privacy violations*
7. *Harassment related threats*

The aim of the pilot testing consists in the evaluation of the nuggets and the Moodle platform with its open educational resources carried out by trainers, teachers, educators and students from non IT disciplines, who will use the created material in the future. The pilot testing will start in Month 18 (August 2023) and will end in Month 22 (December 2023). The team will conduct pilot testing with trainers and learners in those months, by creating real conditions for teaching non-IT discipline, in which the selected nuggets of knowledge on cybersecurity and/or risk management are embedded.

Each session of the pilot testing will be adapted by the partner according to the target, the institution and the respective discipline.

In total, **180 trainees** will take part in the testing phases of the project's outputs, 30 participants in each partner country.

Trainers, adult educators and teachers can adopt the provided material in developing their own training course in cyber security vs. cyber attacks and/or use it as a reference for the implementation

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of other educational material. As well learners can improve their own competences in the specific topics. During the testing with the learners, key nuggets will be chosen for testing the main tools, concepts and materials.
At the end of the pilot training sessions, the participants will complete an **evaluation questionnaire**. Each person participating in the training will provide feedback by compiling the feedback questionnaire to be filled in using an online system for the automatic data collection after the pilot testing.

The participants will be asked to fill in the questionnaire honestly and carefully, thus supporting the reliability of the data collected.

A) OVERALL QUALITY

1) Please tick the best option that reflects your opinion corresponding to the statements (1 – strongly disagree; 2 – do not agree; 3 – undecided; 4 – agree; 5 – totally agree):

- The overall quality of the Cyber in Practice training materials is very good.
- The learning nuggets produced are clear and easy to understand.
- The training material is valuable for me to gain new knowledge and skills.
- I will utilize the knowledge and skills gained during the training in my life.

2) Please tick the best option that reflects your opinion corresponding to the statements (4 – very valuable, 3- valuable, 2- not very valuable, 1- not valuable at all)

- How valuable are the training nuggets in helping you gain new knowledge and skills on cybersecurity, best behaviors to avoid cyber attacks and possible actions to be carried out to face these attacks ?
- How valuable are the learning nuggets in helping you introduce the required competences to face cyber attacks in your daily tasks?

B) **QUALITY of the Learning Nuggets**

1. Please rate how satisfied are you with the content of the learning nuggets of Cyber in Practice Project (4 – excellent, 3-good, 2-poor, 1- very poor):

- I am satisfied with the content of the Nugget n.1 –Area of Social Engineering
  .....

2. Please state **WHAT** could be **changed/improved** in terms of the content of the learning nuggets? .....

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

1) Please tick the best option that reflects your opinion corresponding to the statements (1 – strongly disagree; 2 – do not agree; 3 – undecided; 4 – agree; 5 – totally agree):

- The interface of the Cyber in Practice Moodle platform is user-friendly.
- The digital tools in the Moodle platform are innovative
- The quantity of digital learning material is adequate

2) Please state if the Cyber in Practice Moodle platform has met your needs. What could be changed or improved in the Moodle platform?

Grading system/scale

There are 65 learning nuggets at the Cyber in Practice Moodle platform, which include 3 parts: Introduction/use-case/infographic, Theory and Assessment quiz game. Assessment quiz game is used for grading results of learning course.
Grading system:
100 % of right answers – 100 points
85 % of right answers – 85 points
75 % of right answers – 75 points, recommendation: to study additionally some topics
Less than 60 % of right answers, recommendation: to study course once again.

Thesaurus/Glossary of terms

It is a list of definitions what are necessary to fluently working with learning material.

Recommendations foreseen for integration of the training material(s) into the main content of the relevant disciplines (approaches and, tools to be used)

Subconsciously, nuggets are helping the learner acquire the necessary knowledge through **smaller learning sessions** that are making the subject easier to comprehend, by focusing on keypoint that

really interest the learner. At the same time, through answering questions and firing up discussions between the learners, nuggets increase the engagement and bring better results.

Even though learning nuggets are an effective means of conveying content in a targeted and effective manner, they have their limitations. Learning nuggets are useful when the content to be taught is small, preferably self-contained topics. Complex product presentations are less suitable. In such cases, larger e-learning modules can be much more useful.