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DIGITAL COURSE

ELEARNING SIMULATION ENVIROMENT IN TECH CENTERS

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SOMATICA MATERIALS & SOLUTIONS

This guide is a result of the project:

VIRTUAL INTERNSHIPS IN TECH CENTERS: TRAINING VET STUDENTS WITH OBSTACLES INTO A INNOVATIVE DIGITAL METHODS OF REMOTE WORKING AND ELEARNING CREATED FROM COVID-19

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ERASMUS PLUS PROJECT
VIRTUAL INTERNSHIPS IN TECH CENTERS: TRAINING VET STUDENTS WITH OBSTACLES INTO A INNOVATIVE DIGITAL METHODS OF REMOTE WORKING AND ELEARNING CREATED FROM COVID-19

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CONTENTS

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INTRODUCTION

DIGITAL COURSE: ELEARNING SIMULATION ENVIROMENT IN TECH CENTERS

"DIGITAL COURSE: E-LEARNING SIMULATION ENVIROMENT IN TECH CENTERS" is a digital course developed within the framework of the Erasmus+ Programme Project "VIRTUAL INTERNSHIPS IN TECH CENTERS: TRAINING VET STUDENTS WITH OBSTACLES INTO INNOVATIVE DIGITAL METHODS OF REMOTE WORKING AND E-LEARNING CREATED FROM COVID-19", focused on vocational training (VET) students with obstacles, to train them in all the knowledge and skills necessary to successfully carry out virtual internships in the technology sector, both to students who participate in the virtual mobilities of the network, and all those who want to develop necessary skills in the technology sector and prepare to work in it.

THE COURSE GIVES ACCESS TO 5 SIMULATED JOBS

- Design of electronic circuits.
- Design and rendering of 3D-models.
- Construction of 3D-printing devices.
- Laboratory technician.
- Digital environment programming.

This course generates LEARNING BY DOING by placing the student in a private e-Learning environment that simulates the scenario of a specific job with the characteristics, structure, equipment, and software in which the student needs to carry out activities according to the functions they will have in the future internships in the technological company.

The course begins with an initial survey that defines the previous knowledge required and the details of the job you will develop in the future virtual mobility. Once this step is completed, you will access the theoretical part of the course, in which you will study the necessary skills to work in a virtual environment (AREA 1: WORK IN A VIRTUAL ENVIRONMENT), the working methods throughout all phases of the process (AREA 2: WORKING METHODS), knowledge to use the work tools (AREA 3: WORK TOOLS), and support materials for each virtual environment (AREA 4: SUPPORT MATERIALS FOR SIMULATION).

After this step, you will access a simulated digital environment, similar to that of the workplace, in which you will find all the processes to follow to start working. When you access this environment you'll have to introduce yourself to an avatar that represents your tutor in the company, who will explain you how the simulator works and will take you to an itinerary of activities that will lead you to carry out the tasks of the job. Thus, for example, in the job "Design and rendering of 3D-models" you will be proposed to generate *gcode* programming for printing, redesign the piece according to set characteristics, do a printing simulation, and other activities.

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OBJECTIVES

DIGITAL COURSE: ELEARNING SIMULATION ENVIROMENT IN TECH CENTERS

Due to the situation lived during the COVID-19 pandemic, many VET students could not carry out internships in companies, having to replace them in many cases by theoretical works, thus losing the opportunity of having a first real labor experience. Likewise, COVID-19 has increased the chances of you having to face virtual jobs during your career, in which on-site attendance will be seldom.

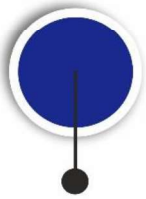
MAIN OBJECTIVE OF THE COURSE

To train vocational training (VET) students, especially those with obstacles, with all the knowledge and skills necessary to successfully carry out virtual internships in companies in the technology sector, and acquire digital skills to work virtually on innovative projects.

In addition to the main objective, other important ones are:

To offer VET students, especially those with obstacles, the opportunity to train to participate in virtual mobilities in technology companies across Europe, developing their analytical and digital skills.

To promote the training and labor and social inclusion of VET students with obstacles.



To generate innovative methods that promote virtual work processes in technology companies, adapted to the new post-COVID-19 reality, that are effective and useful to enhance teleworking and digital working methods.

All these objectives, as well as the global objectives of the Erasmus+ project in which this result is framed, match those stipulated by the European Reference Framework for Quality Assurance in Education and VET (EAQVET) and the OECD recommendations set in the Education at a Glance 2020 Report.

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COMPETENCES

DIGITAL COURSE: ELEARNING SIMULATION ENVIROMENT IN TECH CENTERS

The European Union Council, in the "Recommendation of the Council of May 22nd, 2018, related to the key competences for lifelong learning", insists in promoting the development of the key competences to achieve a European Space of Education in which to use the potential of the education and culture as a mechanism for professional, personal, and social development, as well as to live the European identity in all its diversity.

> *"The European Pillar of Social Rights (1) sets out as a first principle that everyone has the right to quality and inclusive education, training, and lifelong learning, in order to maintain and acquire skills that enable them to participate fully in society and successfully manage transitions in the labor market. It also establishes the right of every person to receive personalized and timely assistance to improve their prospects for employment or self-employment, to training and self-recycling, to lifelong education, and to assistance for job search.[1]"*

[1]Key competences are defined as the combination of knowledge, skills, and attitudes. In this sense, knowledge is considered to be composed of facts, concepts, and theories that support training in a specific area or topic; capabilities are defined as the ability to make use of such knowledge to get results, and lastly, attitudes describe the ability and intention to react to concepts, individuals, or situations.

Thus, competences can be developed both in a formal education context and in non-formal and informal educational contexts. In this sense, they highlight the importance of non-formal and informal learning as an effective means to develop communicative and cognitive skills, and to develop the main critical thinking competences, such as analysis, problem solving, expression skills, perseverance, etc.

Throughout this course, six key competences will be developed from the seven set out in the Recommendation of the Council of the European Union cited above:

[1] Council Recommendation of 22 May 2018 on key competences for lifelong learning. **(Text with EEA relevance)** (2018/C 189/01). Official Journal of the European Union C 189/1.

1. Competence in linguistic communication: it refers to the ability to express ideas and concepts, as well as the ability to communicate with other people orally, in writing, and through technology. This competence is considered an an essential means for socialization and the benefit of the educational experience.

2. Mathematical competence and basic competences in science and technology: while the mathematical competence contributes to developing skills to apply mathematical reasoning to describe, interpret, and solve questions in various contexts of everyday life, competences in science and technology contribute to the development of scientific thinking for the acquisition of knowledge, the comparison of ideas, and the application of discoveries for social welfare.

3. Digital competence: it involves the safe and critical use of information and communication technologies (ICTs) to access, process, and use information for communication, content creation, and problem solving. Digitalization aims to bring benefits to work, employability, learning, the use of leisure time, inclusion, and participation in society.

4. Competences of Learning to Learn: this competence is essential throughout life, both in formal and non-formal and informal contexts, since it implies the development of skills to start, organize, and persist in learning. This competence allows to develop competences of the critical thought, such as decision making, reflection, or the assessment of ideas.

5. Social and civic competences: they entail the ability to use knowledge and attitudes in order to relate and actively participate in social and civic life. On the one hand, the development of social competences allows to understand the intercultural and socio-economic dimension of society. On the other hand, the development of civic competence is based on the acquisition of knowledge related to justice, democracy, equality, and human rights.

6. Competence for the sense of initiative and entrepreneurship: it involves the skills to turn ideas into actions, recognize opportunities and risks, manage projects, make decisions, or develop creativity.

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METHODOLOGY

DIGITAL COURSE: ELEARNING SIMULATION ENVIROMENT IN TECH CENTERS

E-LEARNING SIMULATION ENVIROMENT IN TECH CENTERS is based on a methodology of practical work training, that in recent years has become very important: THE SIMULATION OF WORK LEARNING.

This is an effective method based on immersive computer technologies that conceives students as active agents in the development of their knowledge, skills, and professional attitudes through experience.

Through this methodology you will improve your:

- Capability to process and analyze information.
- Capability to work in a team, innovation, and creativity.
- Capability to make decisions and influence those of the work team.
- Communication capabilities and use of technology.

The simulation of work learning is an effective methodology so that students can adapt to virtual work environments, in which to make decisions, evaluate results, and collaborate with other students in the same situation, receiving feedback on their actions, solving problems that may arise as a team to avoid unnecessary risks.

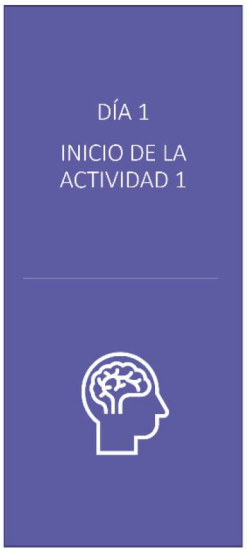
In this sense, simulations allow to improve learning skills in certain situations, and provide a high level of interaction.

To carry out this methodology, the simulation of this course lasts for 11 days. Each day is 8h long, since this is the maximum length of a standard working day. Each time you login to the simulator, minutes will be added to the counter until 8h is reached, when the day will change to the next. Throughout each day you will face situations typical of the job of which you are carrying out the simulation.

In this way, you will not only acquire knowledge for employability in technology companies, but also the necessary skills to carry out your own tasks framed in innovative virtual projects throughout the simulation, thus also acquiring mechanisms to improve your social and labor inclusion.

In this sense, the programming of the simulation is as follows:

DAY 0: INTRODUCTION TO THE SIMULATOR: the first day you log into the simulator you will meet an avatar (tutor), who will introduce you to it. After this brief explanation, you will access the main screen, to familiarize yourself with all the resources and tools available in it.



DAY 1: START OF ACTIVITY 1: you will access the tools and resources provided in the simulator to start the activity.

Each activity will be completed in 3 working days.

In order to carry out collaborative work, you can communicate with other students also connected to the simulator via real-time chat, as well as with the tutors of technology companies through an internal email.

All the information provided by both the tutor avatar and the technicians of the company is stored in a folder on the main page, so you can resort to these explanations whenever you need it.

DAY 2: ADVANCING IN ACTIVITY 1: during this day, you will directly access the main screen of the simulator and continue with the development of the activity.

DAY 3: FINISHING ACTIVITY 1: throughout this day you will finish activity 1 and send your results by email, so the company can check its completion.

DAY 4: START OF ACTIVITY 2: when you log into the simulator on the fourth day, you will start the second activity. Even if you have advanced to this activity, you will still have access to the previous ones and all the tips related to them.

DÍA 7

INICIO DE LA ACTIVIDAD 3

DAY 5: ADVANCING IN ACTIVITY 2: the same as on day 2.

DAY 6: FINISHING ACTIVITY 2: the same as on day 3.

DAY 7: START OF ACTIVITY 3: the seventh day will be the same as day 4, but with activity 3.

DAY 8 AND 9: ADVANCING IN ACTIVITY 3: the same as on days 2 and 3.

DAY 10: FINAL EVALUATION AND CERTIFICATION: on the last day of the simulator, and once all the activities have are delivered, you will face a final evaluation test. Once you pass it, you will receive a digital certificate that acknowledges the completion of the course and the simulation.

In this way, when you start the virtual mobility, you will already have a previous experience practice that has trained and prepared you to make the most of it and be effective for the company in which you will work virtually.

DÍA 10

EVALUACIÓN Y ACREDITACIÓN

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CONTEXT

DIGITAL COURSE: ELEARNING SIMULATION ENVIROMENT IN TECH CENTERS

The effects of the COVID-19 pandemic have highlighted the need for changes in the educational field that adapt education to a new post-COVID reality. Many of them begun to be carried out urgently directly by teachers and schools themselves to face the closure of schools during the first half of 2020 throughout Europe (which meant the loss of 31.5 working days in each of them according to the 2020 OECD report). It is thanks to their effort and dedication that progress has been made in the modernization and digitalization of education, adapting it to the reality originated as a result of the pandemic, and alleviating in some way the learning delays that students could suffer.

However, the study *Learning inequalities in confinement*, drafted by UAB researchers, points out that there has been an educational loss in a large part of the students, especially in those who face more obstacles. These studies match those of the 2020 edition of UNESCO's Global Education Monitoring report, which concludes that students' educational differences increased during confinement. These differences are not only due to their socioeconomic level and their environment, but also to the response of educational centers when it comes to transferring on-site training to telematic.

In the case of VET education, this is much worse, not only because the employability situation has worsened with the pandemic, but because digitalization processes were not able to maintain practice-oriented training and internships. OECD determines that these mobilities are essential for the employability of students, especially if they are subject to obstacles, (in Spain, for example, the employment rate of people who did compulsory professional internships in a company is 28% higher than that of those who have not had any work experience while studying).

Due to the pandemic and the precarious economic situation it has caused, all the mobilities and a large part of work internships have been canceled. This is a very hard blow for students, especially those in situation of exclusion, who have seen drastically limited one of the main mechanisms they had to access a job.

In this context, the partner entities of the project "VIRTUAL INTERNSHIPS IN TECH CENTERS" wanted to develop a course as a tool to train VET students, especially those with obstacles, so they can carry out virtual internships in technology companies, which not only give them the opportunity to access the labor market with greater experience, but also to promote their inclusion.

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CONTENTS

DIGITAL COURSE: ELEARNING SIMULATION ENVIROMENT IN TECH CENTERS

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AREA 1

WOKING IN A VIRTUAL ENVIRONMENT

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6.1.1. INTRODUCTION

One of the consequences of the COVID-19 pandemic was a transformation, an acceleration of digitalization at a social, academic, and labor level.

The tools provided by digitalization have not only allowed us to maintain the development of student training, once the possibility of on-site training in the classroom was reduced and even cancelled, but also allowed us to adapt working methods in companies to teleworking.

Currently, although the landscape since the beginning of the pandemic has changed, the demand for skills to work in virtual environments has increased a lot. Since the health crisis, remote working has become a common practice for millions of workers in Europe and around the world.

According to estimates made by Eurofound in 2020, around 40% of workers in Europe started teleworking full-time as a result of the pandemic, 25% more than before the arrival of COVID-19. A study carried out by InfoJobs (https://nosotros.infojobs.net/prensa/notas-prensa/el-teletrabajo-registra-cifras-record-en-espana) in Spain highlights that "*the number of vacancies registered in the InfoJobs portal that collected some type of teleworking modality during the first four months of 2022 doubles the figures of the same period of 2021 and multiplies by 10 those of 2020.*"

6.1.2. OBJECTIVES OF THE AREA

The main objective of the first area of this course is to serve as a way for VET students, especially those with economic, social, and labor obstacles, to acquire knowledge about working in virtual environments and face a work reality characterized by greater virtuality as a result of COVID-19, as well as to develop the key competences of critical thinking as a basis for decision making.

Didactic Units 1 and 2 are focused on working in virtual environments with the aim that you acquire knowledge and favorable attitudes to work in virtual environments, thus contributing to collaborative work, overcoming conflicts, and problem solving.

As for the 3rd Didactic Unit, the objective is that you understand the bases of critical thinking, so that you are able to make reasoned and argued decisions with rigor in the workplace.

6.1.3. CONTENTS

U.D.1 - Introduction to working in a virtual environment

The concept of working in a virtual environment in a technology company can overwhelm you at first, as it can generate many doubts such as: will I be able to apply the knowledge I have acquired during my studies working in a virtual environment? Will I have the support of a work team? Will I learn during the internship? Will I be able to participate in projects without being present at the technology company's facilities?

However, the opportunities that it offers are many, especially for students that want to carry out internships of middle degree training cycles in technology companies in Europe, but they have not many means to travel to another country.

In this sense, carrying out an internship in a virtual environment will not only allow you to access participation in cutting-edge innovation projects, working side by side with prestigious specialists and researchers in the technology sector, but also to expand your curriculum with a view to a first job. All of this without the need to face extraordinary costs.

The same as in on-site environments, working in virtual environments not only allows you to apply the knowledge acquired, but also encourages learning and the acquisition of skills and competences specific to the technology sector, such as collaborative work and the development of critical thinking.

STUDENT FUNCTIONS DURING A VIRTUAL INTERNSHIP IN TECHNOLOGY COMPANIES

- Participate in follow-up virtual meetings.
- Exchange ideas in debates.
- Collaborate with the rest of the team.
- Present the results of your tests.
- Carry out a critical analysis of your trials and results.
- Reflect on problems that may arise.
- Generate an environment of trust and reflection.

Collaboration in a work environment, especially if it is virtual, is a key mechanism both to acquire the fundamental knowledge, skills, aptitudes, and attitudes to the labor and personal areas, and to promote the development of critical thinking and value the knowledge and work of others.

All of this will generate a spirit of learning, solidarity, and cooperation that will encourage reflection and communication, allowing you to evaluate your own way of working and develop self-learning. In this sense, thanks to collaborative work, you will have the opportunity to exchange experiences and knowledge with other students and technicians of companies.

Throughout the process, you will have a tutor from the technology company and a tutor from your educational center who will guide and help you at all times. Throughout the course "**DIGITAL COURSE: E-LEARNING SIMULATION ENVIRONMENT IN TECH CENTERS**" we will address all the relevant aspects to work in virtual environments.

U.D.2 - Attitudes that make work easier

In order to facilitate work in virtual environments, it is important to consider the attitudes that promote their development (commitment, transparency, perseverance, respect, and teamwork). The set of these attitudes don't not only allow for positive progress in the development of a project, but will generate a more cohesive work environment. Below, we show you the main actions that facilitate putting these attitudes into practice:

ATTITUDES THAT FACILITATE WORK:

- COMMITMENT AND RESPONSIBILITY.
- TRANSPARENCY.
- CONSTANCY.
- RESPECT.
- COLLABORATION.

Commitment and responsibility:

All team members must take responsibility for their tasks and those of the rest, generating mutual learning. Sharing responsibility allows for individual and collective commitment. The following actions facilitate such attitudes:

- Demonstrate interest in knowing the objectives of the project.
- Show initiative.
- Actively participate and express interest in the development of the tasks to carry out.
- Keep a stable and fluid communication with the rest of the workers and tutors.
- Meet the established dates.

Transparency:

- Admit mistakes and not hide mistakes you make, as they can influence the final result.
- Exchange ideas without hiding the results of your essays or the status of the task.
- Express your own ideas clearly.
- Accept the suggestions others can make of your work.
- Make constructive evaluations of the work of others.

Constancy:

The evaluation and constant monitoring of the work done will allow you to analyze the information accumulated and deal with possible problems that may arise. The following actions facilitate consistency:

- Establishing regular meetings.
- Reviewing the work done.
- Following the planned schedule.

Collaboration and respect:

The main basis of collaborative work is cooperation, which encourages mutual learning and the development of the skills and aptitudes necessary to cope with the labor market. The following actions facilitate collaboration and respect:

- Meeting the assigned dates and tasks.
- Keeping in mind that the pace of your work can impact the rest of the team.
- Trying to be polite and kind when expressing your ideas.

U.D.3. Critical and scientific thinking as a basis for decision making

Critical and scientific thinking as a basis for decision-making and the evaluation of one's own actions not only implies reflection and willingness to recognize mistakes, but also to change your mind, accept the existence of other alternatives, and analyze and evaluate your own way of thinking.

One of the main characteristics of critical and scientific thinking is the evaluation of the way in which you have reached your own conclusions, posing and solving problems through analysis and reflection. This involves judging the way in which you have posed a problem, looking for the information necessary for its understanding and analyzing its credibility, analyzing and drawing conclusions from the problem posed, and sharing them with other people through an exchange of ideas in which you demonstrate your ability to express clearly and defend your own positions and conclusions, accepting both the positive and negative comments they can bring you.

3.1. KEY COMPETENCES OF CRITICAL AND SCIENTIFIC THINKING

With the objective of developing the critical and scientific thinking it is necessary to acquire certain competences, such as:

1. Evaluation of one's own way of reasoning: one of the key critical thinking competences lies in the ability to understand and analyze in depth each task you carry out, dedicating the time necessary to acquire knowledge about the subject in question, because the objective is to reason before making a decision.

In order to acquire this competence, it is important to:

- Evaluate the established idea; make a thorough reflection that allows you to analyze and evaluate an idea.
- Exchange ideas with the rest of the team; this exchange facilitates reflection and analysis.
- Accept that you may be wrong; everyone can make mistakes, but the first step is to consider this, as it will allow you to better evaluate the established idea.

During this process you will learn to:

- Ponder.
- Assess previous knowledge.
- Develop a previous idea based on the knowledge you have.
- Consider the problems that may arise, encouraging you to find solutions to be able to face them.
- Reason the most relevant aspects.

2. **Raising a hypothesis:** before starting with a specific task, it is important to reflect and analyze, through hypotheses, the problems that may arise throughout the trial, as well as the expected results.

3. **Pose relevant questions:** these will allow you to ponder about what is important to advance in a task, being one of the keys of critical thinking.

4. **Look for information:** by searching for information you will learn to distinguish the most relevant information and contrast various sources in order to assess the credibility of the information obtained.

This competence will allow you to:

- Express yourself clearly in your own words.
- Reflect and reason what are the most important aspects to take into account.
- Encourage you to look for information, encouraging your curiosity.
- Encourage reflective thinking, expanding thinking skills.
- Understand how to link different ideas.
- Pose new challenges.

5. **Intellectual integrity and open-mindedness:** being able of not hiding failures or mistakes that may compromise the final result, whether in individual or collaborative work. It is important to be honest and admit the mistakes you may make along the way, accepting the opinions of others, as it will allow you to acquire more knowledge on the subject.

6. Express yourself well: as a basis for effective oral and written communication, expressing yourself clearly is a key competence for exchanging ideas and defending your own conclusions.

7. Be persevering: the importance of not giving up on a problem, but being able to deal with it by searching for information, exchanging ideas, breaking down a complex task into simpler ones, etc.

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AREA 2

WORKING METHODS

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6.2.1. INTRODUCTION

Teleworking has advantages and disadvantages. Taking full benefit from the advantages requires following well-thought-out rules and strategies, as well as a clear commitment on the part of the worker to their productivity and commitment of the company in terms of adjusting the tasks assigned to the worker to the working day.

It is important to pay special attention to strict compliance with the working day by the student who is doing the virtual internships, so the work with the company's team is productive. However, it is also essential to completely disconnect from work outside working hours, especially in the case of virtual work or teleworking, in which the work environment and the worker are not always well separated.

Virtual internships are proposed as a group work, like a work team, carried out by several students. Precisely the fact that it is a virtual internship allows the students who make up the work team to be of different nationalities and in fact to work from different countries of the European Union.

6.2.2. AREA OBJECTIVES

The main objective of this area is to serve as a guide for you to acquire knowledge about the work methodology to carry out internships in virtual environments in companies in the technology sector.

To do this, you will study the working methods in all phases through 4 Didactic Units, from before starting the virtual work to its completion.

6.2.3. CONTENTS

U.D.1. Prior to work

1.1. MECHANISMS TO ADAPT YOUR HOME TO VIRTUAL WORK.

The obligation to work from home has generated the need to adapt a place in it to be used as a work and study area. The first thing is to choose a place of the house where to work. In general, it should be a place with little noise and distractions, as comfortable and functional as possible. Creating a pleasant work and study environment will allow you to be more effective during work and will have a number of advantages, among which are:

- It avoids possible physical and mental health problems.
- It helps optimize the available spaces and resources.
- It allows you to create effective work and study habits.
- It helps us improve adaptation in the face of adversity.

Adequacy of the WORKPLACE:

In order to adapt the workplace at home, and to make it as productive as possible, it is best to have a room for exclusive use in the house to work and study. However, this is not possible in many cases, which forces to adapt a place in a room that has another use and dedicate it to work (bedroom, living room, etc.).

TIPS TO HELP YOU TURN AN AREA OF YOUR HOUSE INTO YOUR WORKPLACE

- Locate the quietest place to turn it into the work area. It must be a place free of noise, to allow you to concentrate easily, with a nearby internet access via wired or wireless connection. It must have nearby electric plugs to connect the laptop or PC and smartphone, in addition to all technology devices necessary for work.

- The place must have adequate temperature and lighting conditions to promote concentration at work, avoiding excessive sensations of heat or cold. The proper view of the devices and work area is also very important, so try to choose natural light or similar.

- Once the workplace is chosen, have a clear and effective separation of the work area from the rest of the house. All people who live in the house must know what is the work area and that during the working day you should not be disturbed.

- Look for accessories that facilitate organizing the work area. The organization of work tools and devices is very important. An orderly work area makes it easier to focus on work and make the effort more profitable. The things that are used more often should remain close, and those used less frequently should be most remote.

- When the workday is over, you should be able to put everything back in place. Thus, once you finish working, it will be easier to disconnect, rest, and enjoy leisure at home.

ADEQUACY of the workspace:

Regarding the design of the workspace, a series of requirements it must meet:

- The arrangement of tools, devices, and materials in the workplace must allow changes in posture, avoiding prolonged static postures.
- All elements in the workplace must be adjustable, to allow you to work in the most appropriate position.
- The height of the work plane must be adapted to your height and to the type of work to carry out.
- The chair must also be adapted to your size/height.
- The tools, devices, and materials necessary to work must be located at a distance and position as appropriate as possible to make it functional.

The chosen room or work area must have enough space and allow you to change posture and move enough.

During breaks, you need to be able to stretch and move freely, to relieve you of accumulated tension and reactivate blood flow.

If possible, follow these recommendations when designing and implementing the place where you will work from home:

LIGHTING in the work area:

A very important aspect of the workplace is its lighting; good lighting is achieved with natural light, sunlight through a window or door, which helps you not to strain your sight, and reduce light pollution from computer screens and electricity consumption. If natural light is not possible to use, a good alternative is to use lighting that simulate sunlight. For this, a desktop lamp with the appropriate luminosity is fine, in addition to the ambient light of the room.

The level of lighting of the work area should reach 500 lux, with which is possible to distinguish objects easily, thus also reducing visual fatigue. It must also be located so that light sources, such as windows, do not cause glare nor produce reflections on display screens.

We recommended you not to use localized lighting lamps, which greatly increase lighting of the work area; illuminate it in a general way. This makes pupils not having to dilate and contract so frequently, thus reducing eye strain.

ENVIRONMENTAL conditions of the workplace:

The noise level in the working area must be low enough to facilitate the necessary concentration. Locate it in an area of the house sufficiently isolated from external noise. Thus, avoid locating it near possible sources of noise, such as air conditioning devices (compressor), refrigerators, TV or radio devices, etc.

The temperature of the work area must also be adequate to allow a comfortable and pleasant environment for work. If possible, regulate the humidity of the working environment, trying to keep it between 45 and 65%.

Conditions of ORDER and PLANNING of the job:

In order work efficiently, order and organization is paramount. You can use shelves, drawers, filing cabinets, etc. to classify and store things in an orderly and accessible way.

TIPS TO HELP YOU FOCUS ON THE WORKPLACE

- Take breaks from time to time.
- When find yourself blocked at work and don't get something right, take a break and to clear your mind and you'll be better able to find a solution.
- During breaks, stand up and take a walk around the house for a bit.
- Properly ventilate the space each day, to renew the air in the room.
- Always have a bottle of water nearby; hydration is essential.
- Even if you are at home, dress every day as if you were leaving home.
- Tidy up your workspace when you're done.

1.2. AGREEMENTS

Before starting any mobility, whether virtual or on-site, a series of agreements must be signed, establishing their conditions and their evaluation. In 2021, specific rules have not yet been established for virtual mobilities and the allocation of ECVET credits in this type of mobility. However, regarding on-site mobilities, it is necessary to sign the following agreements, which we can take as a reference:

MEMORANDUM OF UNDERSTANDING (MoU): it is an agreement that establishes the operating conditions of the partnership regarding the objectives, length, and modality of revision of the agreement itself. Through this document the partners establish their respective criteria and procedures for quality, safety, evaluation, validation, and recognition of skills and competences for the transfer of ECVET credits.

Likewise, by signing the Memorandum of Understanding, the partners accept the respective statutes of the competent bodies, approve the operating conditions of the association and identify the competent organizations that will participate in the process.

LEARNING AGREEMENT (LA): it is the document of agreement between the sending organization, the host organization, and the student. It states that the host organization will evaluate the learning outcomes acquired by the student, and the sending organization will validate and recognize them according to the established rules and procedures.

1.3. RIGHTS AND DUTIES OF A VIRTUAL INTERNSHIP

The objective of an internship in a company for you to acquire practical training in a job, having the opportunity to apply the knowledge you have acquired during the training cycle. In this sense, during the internship period, each student will become part of the team of the

company and, like all other workers of a company, the students in internships, whether virtual or on-site, have a series of rights and obligations.

RIGHTS

- Tutoring. Each student has the right to have a tutor both from the company where they do the internship and from the educational center to which they belong.
- Comply with your academic, training, representation, and participation activity.
- Monitoring and evaluation. You have the right to receive reports on monitoring, evaluation, and assessment of learning during the internship period.
- Medical leave: you have the right to a medical leave in case of illness, if the doctor so requires.
- Non-discrimination. Whether you are a student or worker, one of your basic rights is not being discriminated against in any work environment.

OBLIGATIONS

- Regulations. Like any other worker of the company, you as a student must comply with the rules established in the company where you do the internship.
- Finish the project. You must comply with the training project of practices that have been indicated in the company.
- Communication. You must keep a constant and fluid contact with both the tutor and the rest of the team. This is especially important in virtual environments.
- Laboratory notebook. Students must fill in the monitoring laboratory notebook established in the technological companies of the network daily, throughout the development of the practices.
- Final report. At the end of the internship you must make and present a final document that exposes all the work done.

1.4. WORKING DAY

Before starting the virtual internships, it is very important to know the work day that you will have to carry out. This is ruled by the teleworking norms of the company, so it will be the same as for the other technicians and employees, but remotely.

The specific working hours of your working day are stipulated by the company, and will never exceed the maximum time established by law (8h). During the working day, you must be available to communicate with your tutor, your coworkers, and team members.

You have to register at the beginning and end of each day through a message via Skype with the tutor, and in case of having a split working day, also the beginning and end of the pause period.

1.5. RISK MANAGEMENT

Thanks to risk management we can identify, analyze, and deal with all the difficulties that may arise during the virtual mobility process. Therefore, when starting a virtual internship, one must carry out an analysis of the risks that may arise following the management processes specified below, to avoid possible setbacks or accidents and have correction mechanisms for those that may arise.

1.5.1. PROCESSES FOR RISK MANAGEMENT

- **IDENTIFICATION OF RISKS:** the process that details possible risks that may affect the project and documents their characteristics. This process is vital to provide the necessary resources to analyze and address said risks.

This requires the following:

- Establish identification strategies and mechanisms.
- Identify risks.
- Document features.
- Record risks.

- **RISK ANALYSIS:** the process that analyzes the probability that the identified risks and impact happens. This point helps us prevent or minimize the impact of a risk.

This requires the following:

- Determine the likelihood of risks.
- Determine the impact of risks.
- Analyze the consequences of risks.
- Prioritize risks.

- **DEAL WITH THE RISKS:** it determines the actions that must be carried out to face the identified risks, to reducing their chances of happening, and establishes the mechanisms to plan the response to those that may arise.

This requires the following:

- Identification and assignment of a control manager.
- Plan a risk response strategy.
- Establish a strategy to deal with risks.

- **RISK CONTROL:** this process monitors the planning carried out to continuously evaluate the effectiveness of the strategy and identify changes in the situation that may generate new risks.

This requires the following:

- Analyze strategies.
- Select alternative strategies.
- Continuous monitoring.
- Hold regular meetings in the team.

1.5.2. RISK FACTORS

A risk factor is an element or set of them that, if present in the workplace, can cause a decrease in the health of the worker, being able to cause different damages to them and the environment.

Many risk factors can be identified at work, depending on their causes. In remote work, pay special attention to the risk factors that we list in the following sections, taking preventive actions and measures to reduce their probability of triggering health problems in students:

a) General risk factors at the workspace:

Considering that it will be necessary to adapt an area of your home as a work and study area, you need to pay attention to the habitability of a big enough space to install all the necessary devices, avoiding possible falls and blows, keeping an adequate temperature and ventilation of said work area.

b) Ergonomic risk factors:

This refers to the risk factors caused by the adaptation of part of the home to the work area. The main ergonomic risks that can affect health come from the work environment itself and the conditions in your home.

The factors causing these disorders are mainly incorrect posture, keeping a static posture in front of the PC, and repetitive movements. This highlights the need for a correct ergonomic design of the workplace, correctly choosing its elements.

The design of the workstation must be adapted to the available space and furniture of the house, which can cause problems arising from posture.

PREVENTIVE MEASURES

- Identify and enable a work area that is isolated from the rest of the house, a space that can house all the devices and materials necessary for work.
- Keep the space tidy to avoid falls or blows, and respect the passage areas. Mind the arrangement of cables, trying to have a fixed installation to avoid possible entanglements or falls.
- Control the temperature and ventilation of the workplace, to improve comfort and air quality to create a safe and pleasant work area.
- Organize your working day schedule, with set working hours and breaks, to guarantee your days to rest and digital disconnection.

Ergonomic aspects in the design of the workplace:

– **Worktable:** an inadequate the height of the worktable will increase the possibility of developing musculoskeletal conditions. It must have the right size to allow us to sit comfortably at it, and have enough space to place all the devices and work tools comfortably and orderly, to work accordingly. As general characteristics, consider the following:

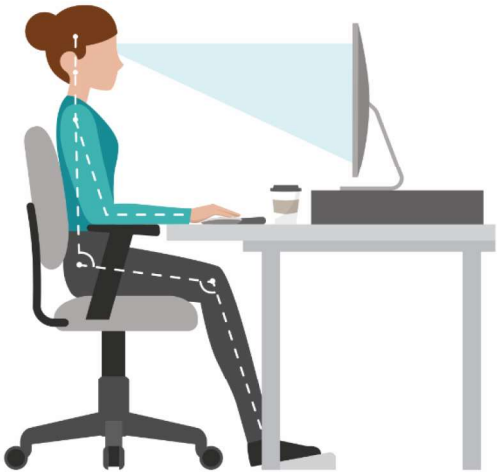
- Its height must be appropriate to the height of the chair, so it allows us to place the forearms in a position as horizontal as possible, to not force excessive bends of elbows, shoulders, and/or wrists.
- If it has a fixed height, it should be of approximately 70cm.

- If the height can be adjusted, adjust it according to your height to 65 to 75cm.
- The minimum recommended dimensions are 120cm wide and 80cm deep.
- The surface of the table should be matte to avoid reflections, of a not too dark color.
- It should allow for a comfortable placement and change of position of the legs.

– **The chair:** the ergonomic design of the chair must meet the following characteristics:

- The **seat** should be height-adjustable, allowing you to rest your feet on the ground. It should be at least 40cm wide, and minimum 38cm deep. It should be padded, and covered with flexible and breathable fabric. Its forward edge should have a slope, to favor blood flow in the legs.
- The **backrest** should be height- and angle-adjustable. It should also properly support your lumbar area of the back and lumbar vertebrae.
- The contact **base** of the chair with the floor must ensure its proper stability, so it should have five wheeled arms to allow adequate freedom of movement too.
- It should include height-adjustable **armrests**.

– The **keyboard** should allow you to keep a comfortable posture, that doesn't cause fatigue in your hands and arms. Also consider using **wrist rests**.



- It must be reclinable, to allow us to keep a comfortable posture and avoid fatigue of the arms or hands.
- It should be easily repositionable and independent of the screen, to allow its relocation depending on the task to be performed or the posture of the student.
- It should be as flat as possible, to avoid movements that force you to flex your wrists continuously.
- It must be at least 10cm in front of the keyboard, to support your arms, hands, and wrists.
- The surface of the keyboard should be matte, to avoid reflections.
- Symbols and letters should be sufficiently highlighted, clear, and easily legible.

– The use of a **lectern** is recommended if you use printed documents commonly. It should be placed right next to the computer screen and at its same height, to avoid having to turn your head continuously.

– The **footrest** has an important utility if the table or chair isn't height-adjustable, since it allows to avoid inadequate postures and a correct support of the feet on the floor. It must have a non-slip surface.

Also, to avoid possible musculoskeletal injuries caused by an excessively sedentary lifestyle, you should **regularly some relaxation and stretching exercises**: relaxation of eyes and neck muscles, shoulder and back stretching, joint movement, etc.

c) Risk factors derived from physical variables (lighting or temperature), such as visual fatigue or lack of thermal comfort.

Visual fatigue can happen, like tearing or heavy eyelids, stinging or redness of the eyes, blurred vision, or even headaches. To avoid these negative effects, take measures in terms of adequate lighting, avoiding reflections and glare, and an adequate quality of the screen and a correct location of the PC and its accessories.

To work at home, you need a Data Display Screen (DDS), and using one of these screens can cause eye discomfort. In order to avoid visual fatigue due to the use of DDSs, you can follow these recommendations:

– Choosing a good **lighting** system that allows for a good visual comfort and visual perception. Lighting should be preferably natural, although if this is not enough, complement it with artificial light to reach the appropriate visibility conditions.

– **Avoid glare and reflections**, for which a correct location of the PC and its accessories is necessary, avoiding placing them against light sources. If a proper placement is not possible, intense light sources should be covered with light filters or similar, preventing light reflection on the screen and the direct glare on the person.

RECOMMENDATIONS

- Avoid glossy and dark colored materials for work surfaces.
- With natural light, you should ensure that the windows have adjustable protection elements, to avoid glare and control the heat caused by the sun's rays.
- Place your workstation so your vision is not in front of light sources, both natural and artificial light, to avoid possible direct glare.

– The **display screen** must meet the following characteristics:

➢ It should be place so the work area to be displayed is at a height that allows the angle of the line of sight to be between the horizontal and 60º below it.

- The horizontal distance from the user's eyes to the reading screen must be between 40 and 55cm, also depending on the size of the screen.
- The screen should be of enough quality to display a stable image, without glare or scintillation. Its brightness and contrast should be easily adjustable, as well as the contrast between characters and the background, to adapt the viewing conditions to the brightness conditions of your working environment.
- In order to eliminate reflections, choose the right location so that light comes from your sides, avoiding light sources that come from your front or back.

d) Risks due to lack of organization or psychosocial, which can lead to isolation, stress derived from work, stress derived from the use of technology, etc.

They are those directly related to the organization of work and its social environment, ability to carry out the proposed work, and the physical, mental, and social health of the student.

PREVENTIVE ACTIONS

- Carry out the necessary training for the use of ICTs, tools, and programs necessary to work.
- Establish work and rest schedules; ensure digital disconnection.
- Clearly specify the procedure and form of communication between team members.
- Establish an action protocol if technical problems arise when working.

1.5.3. RISK FACTORS THAT MAY AFFECT THE PROJECT

The risks that can affect any project can be classified according to its origin as follows:

- Risks in communication between team members.
- Risks arising from the schedule.

RISKS IN COMMUNICATION BETWEEN TEAM MEMBERS

One of the risks that may arise during the virtual mobility are the problems in communication between the students and technicians of technology companies. To address these risks, we have established communication and participation tools.

In the next unit, "D.U.3 - VIRTUAL WORK", we explain the communication and participation tools, as well as those for the exchange of contents. These establish a set of communication mechanisms that allow you to communicate at all times with the tutors, the technicians of the company, and the rest of the students who are carrying out other virtual internships at the same time. With these tools you'll be able to communicate both in real time and by email.

We have chosen a set of communication platforms that allow to communicate at all times, even if one of the platforms does not work due to a server crash.

RISKS ARISING FROM THE SCHEDULE

CONTROL MECHANISMS

- Set a schedule before starting to work in the virtual environment. Making a timetable of the tasks and objectives to carry out is essential to avoid schedule deviations.
- Share the calendar/schedule among team members, so everyone can have access to notices of deadlines, daily and weekly work monitoring meetings, etc.
- Share work in the cloud, which allows all team members to know the status of the work they are doing.
- Daily meetings: before starting the workday, you'll meet with the tutor to expose the work you've done, as well as the doubts and/or issues that you might have found. These meetings allow the tutor to know the progress of your work and carry out a monitoring. On the other hand, you can carry out dynamic and collaborative debates with the tutor to solve doubts and develop critical thinking.
- Weekly meetings with the company's team of technicians and the tutor to monitor the work they've done throughout the week, as well as the results obtained.

CORRECTION MECHANISMS

- Requesting a situation report to the student.
- Meetings of the working group to take the appropriate correction mechanisms.
- Reviewing the schedule.

U.D.2. When starting the virtual job

2.1. PLANNING.

When starting a virtual internship, it is essential to establish the work plan that you will carry out during it. However, adjustments may be made during the process based on the responsibilities and tasks assigned. The plan is organized in three phases:

Phase 1. Understanding of the project and preparation.

The objective of this phase is having a clear idea of the characteristics of the work to carry out.

First, there will be a team meeting in which the tutor of the company proposes the project that will be carried out during the internship, as well as the working methods.

Secondly, you will need to download and install the communication tools and software packages that you will use. Once this step is completed, access the user manuals of the software you are going to use to understand each software and analyze the doubts that may arise about it, in order to solve them.

The first meeting will set out:

- The objective of the project.
- The work organization strategies.
- A review of the working day.
- A distribution of tasks.
- The periodicity of team meetings.
- The periodicity of meetings with the tutor.
- The communication tools to be used.
- Packages of software necessary to carry out the project.

Thirdly, look online for information and references on the different procedures to be used; if the technicians of the company are going to complement the virtual work with their devices, look for information about the materials and techniques to use.

For example, in the case of the job of "*Design and rendering of 3D models*", in which the models made by the students will be printed in the company, you should look for information about the different types of printing filament, their characteristics and appropriate printing parameters, how a *gcode* file should be interpreted...

Each one must collect the results of this search in a presentation of a maximum of 10 minutes made to the rest of the team in the next meeting. If documents are downloaded, they must be copied to the folders accessible to the rest of the team with the shared work tool.

Phase 2: Project execution.

First, each student will make a preliminary design of the project to carry out during the internship and present it to the rest of the company's team during a virtual meeting. In it, the advantages and disadvantages of each design will be discussed, allowing students to thoroughly understand the problem. The objective is to obtain a preliminary design of the set, reflected as diagrams and freehand drawings.

Secondly, the team will make decisions, based on analysis, about the design of the project and certain relevant aspects. For example, in the case of the "3D design and rendering" job, you'll have to decide aspects like the thickness of the pieces, the methods to join the pieces, the most appropriate printing materials, etc.

Thirdly, having discussed the preliminary design and made a decision about it, the final design that the students will implement will be elaborated.

Lastly, you'll start the project that you will carry out during the virtual internship. The progress will be analyzed through follow-up meetings, both as a team and with the tutor, in which your progress will be presented, as well as doubts or problems that may have arisen.

Phase 3: Conclusions. Final presentation.

At the end of the project, you'll have to draft a final report for it, consisting in a written document that reflects the results obtained, as well as the whole work carried out.

Once this final report has been submitted, you must do a virtual presentation (30min maximum length) to the rest of the team.

"D.U.7 - "AT THE END OF THE VIRTUAL WORK" exposes information about this final report of the internship in more detail.

U.D.3. Virtual work

3.1. MONITORING

3.1.1 ACTIVITY LOG SHEETS

During the development of a virtual internship, you find yourself in an environment in which the interaction with the team of technicians of the company will be telematic. Therefore, it is essential to start the day by establishing a work plan and finish it by reviewing the activities carried out.

You must fill in an activity sheet and save it daily in its folder in the cloud shared by all workers. The following is a model activity sheet with examples to guide you:

Date:	**Worker:**	
Planned activities:	**Objective and result to be achieved:**	**End-of-day commentary:**
Group meeting.	Today we have to talk about…	The meeting took place, but I don't think we reached any clear conclusions. It will be necessary to continue talking about this point.
Design of perforated rods of different lengths.	STL file of rods of XX, YY, and ZZcm in size.	The files were uploaded to the group's shared space, with filenames: [_____].
Meeting with the colleague [_____] to explain to me how to easily modify the file of a rod to build another one of a different size.	I think he/she knows how to do it properly, which will save time and work if he/she explains it to me.	After the meeting, I think I understood the process / we hadn't much time to talk, so I didn't understood it well; we'll continue tomorrow.

3.1.2. FOLLOW-UP MEETINGS

3.1.2.1. TEAM MEETINGS

Meetings between team members are important to discuss key aspects of the work carried out, as well as to discuss and solve any doubts or problems that may have arisen.

Since these meetings will be held virtually, it is important that they are dynamic and effective, and to achieve this goal:

- **Meetings should be held weekly**, both to have more specific topics to discuss and to keep contact with the other members of the team.
- Before each meeting, **set an agenda** and provide them to all team members beforehand.
- Determine the **maximum length for each meeting**. In some cases these should be shorter (for specific issues) and in others, longer (study sessions, presentation of results, etc.). However, all the items on the agenda should be addressed and conclusions reached within the expected time frame.

During these meetings, you should discuss aspects such as:

- Distribution of tasks.
- Reports on the tasks carried out; the results of the tasks carried out will be presented to the team.
- Brainstorming.
- Discussion among team members.
- Tips for troubleshooting.
- Evaluation of the progress of the project.

- The meeting must have a **moderator** chosen at the beginning, or rotating among the different members of the team.
- The meeting must have a **secretary** who must also be a rotating position between all team members. He/she should write down the most relevant points of the meeting, the conclusions, and the agreements reached. All this must be collected as a minutes of the meeting, which will then be uploaded to the shared group folder. The minutes of each meeting should be approved at the following meeting.

Although these meetings are weekly, team members should keep a frequent, daily contact with each other, for example through meetings between two members, for specific consultations. Since this is a work in a virtual environment, it is convenient to maintain a fluid teamwork dynamic in which you feel that you are part of the company's team.

3.1.2.2. MEETINGS WITH THE TUTOR

Communication between the tutor and the students must be continuous and stable. However, you will have an individual Skype meeting with your tutor every two weeks, in which, you will present the progress of your internship in a slide presentation, specifying the activities carried out, the decisions made, and the results obtained so far.

This presentation shouldn't exceed 30 minutes, and once finished, the tutor will raise doubts or propose suggestions that not only provide information about the work done, but also help you in your progress.

Lastly, the planned timetable will be reviewed and, if necessary, the work plan will be readjusted.

3.1.3. THE LABORATORY NOTEBOOK

The laboratory notebook is a document of daily monitoring and work whose structure allows you to develop critical thinking skills, since it is a tool for reflection and critical evaluation of your work, that allows you to understand the assigned task and role in the project as a whole.

Although, at first, writing this notebook may seem very tedious, we think that this is compensated by the educational value and personal growth that it entails. Throughout this notebook, you'll write in your own words texts that express the following aspects:

- Understanding objectives: you must show that you have understood the objectives that the tutor posed in the daily virtual meetings.
- Explain the task you need to carry out.

- Propose a hypothesis that you will have to contrast with the results obtained and evaluate your initial reasoning after the end of the test.
- Reason the methodology you will apply.
- Describe step by step the test you are conducting and its results.
- Evaluate if the result matches the proposed hypothesis.
- Evaluate the reproducibility of methods and results.
- Evaluate the success or errors of the test; you must state the reasons why the results of a test are accepted or if it should be repeated again.
- Present your results to the team and write down the comments made by the team members.

3.1.3.1. STRUCTURE OF THE LABORATORY NOTEBOOK.

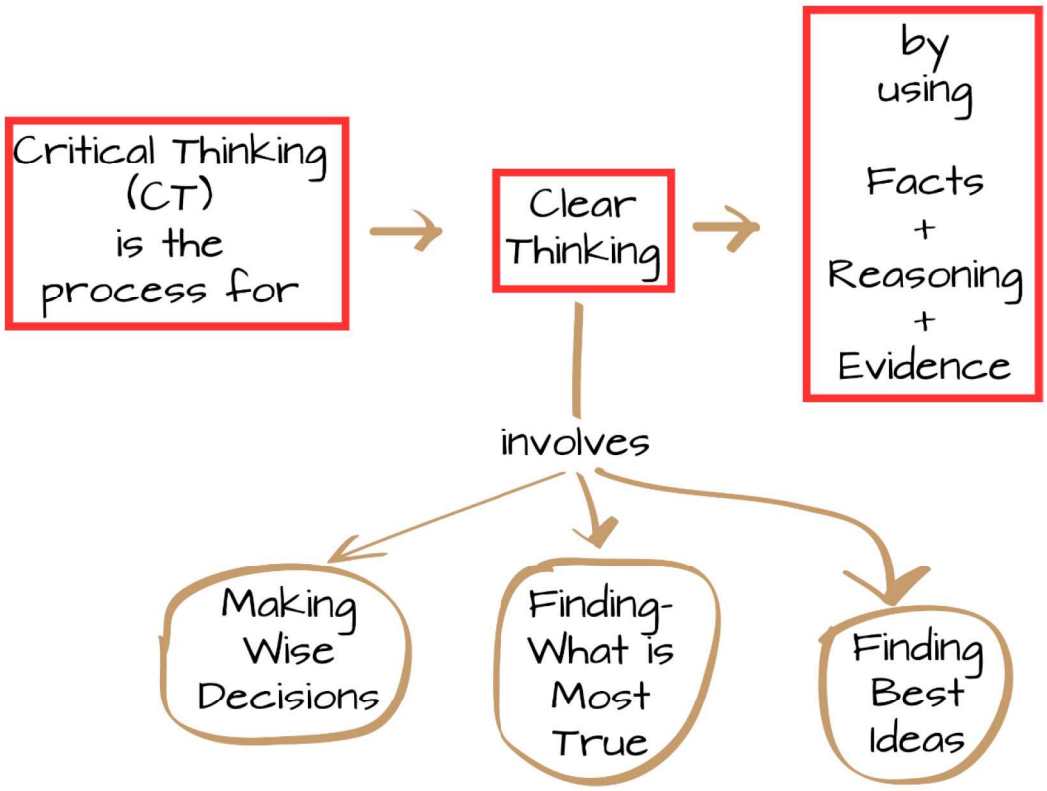
The laboratory notebook is divided into three different parts in which you will expose the data of the tests you carry out while developing all the key competences of critical thinking. These are:

APPROACH: the laboratory notebook begins with an introduction to the work you're going to do. To carry it out, you must answer a series of questions in which you must describe the test or task you will carry out, the area of the company or the project where it is included, the problem to solve, formulate a hypothesis of the result you think you will get, and the solutions you may need for possible difficulties. Lastly, you must state your methodology, the work plan, and the occupational risk prevention measures.

All of this will allow you to start a test based on an initial critical and scientific analysis.

RESULTS: this section constitutes the bulk of the laboratory notebook, since in it you will clearly explain the tests carried out and the results obtained each day. Throughout this process you'll be able to evaluate your own way of reasoning, accept that you can make mistakes, reflect, learn to ask relevant questions, seek information... even to be persevering.

ANALYSIS: at this point, you will have finished the test or task and you have to evaluate the results obtained. For this, first analyze if it matches the hypothesis formulated in the first part, and if not, understand why this is the case. Then, assess the replicability of the test, concluding whether it is valid or not. Thirdly, collect the most relevant conversations with your tutor and classmates that have facilitated the understanding and completion of the essay. Lastly, state your conclusion. In this way, this part will allow you to understand the test as a whole, and all the most relevant aspects of the process.



3.1.3.2. TEMPLATE FOR THE LABORATORY NOTEBOOK

Our goal is for you to become familiar with the laboratory notebook, so that when you start the virtual internship or work (either virtually or on-site) in a technology company, you have had a global vision of the notebook.

Specifically, this model was developed by the team of IKASIA TECHNOLOGIES SL. during the 2017 Erasmus+ project 2017-1-ES01-KA202-038469 *"CRITICAL THINKING AS A STEP FORWARD IN VET EDUCATION: VET students immersed in high technology teams"*.

<table>
<tr><td colspan="3">PART 1.- Approach</td></tr>
<tr><td>Title:</td><td>Folder/server*:</td><td>Date:</td></tr>
<tr><td colspan="3">Brief description:</td></tr>
<tr><td colspan="3">Area of the company or project in which it is framed:</td></tr>
<tr><td colspan="3">The problem at hand:</td></tr>
<tr><td colspan="3">Hypotheses, solutions that can be anticipated, and expected results:</td></tr>
<tr><td colspan="3">Methodology and work plan:</td></tr>
<tr><td colspan="3">Elements of occupational risk prevention:</td></tr>
<tr><td colspan="3">Initial information available (include a brief summary or notes of the available documents, the documents in annexes in the working folder, writing here the file name or reference):

(Add pages as needed)</td></tr>
</table>

PART 2.- Results A		
Title:	**Folder/server*:**	**Date:**
Additional information obtained during the task**:** Alternative testing methodologies, sources in which to contrast the obtained data, etc., include the related files as annexes in the folder, writing here the name or reference of the file.		
Experimental protocol (if there is already a written protocol in the company, just indicate its reference; if there isn't, briefly detail the steps of the experimental procedure)**:**		
PART 2.- Results B		
Title:	**Folder/server*:**	**Date:**
Experimental results (if you write them by hand or print them, copy them here as images, videos, pictures, or any other material attached as files in the folder, writing its name or reference)**:** *(Add pages as needed, copying the whole table)*		

PART 3.- Analysis		
Title:	**Folder/server*:**	**Date:**
Assessment of the result: assess the reproducibility of the trial, does it match what was expected? If it doesn't, why was the expected result so much different from the final one?		**Is the result accepted?**
Notes on conversations with the supervisor or other team members:		
Conclusions (write here the solution to the problem posed and detail the conclusions about the task itself, about the experimental procedure, suggestions for new tests, etc.)**:**		

In conclusion, this notebook is conceived as a tool for monitoring work and for the development of critical and scientific thinking, as it is organized to guide you at all times towards reflection, self-evaluation of the way of reasoning, the approach and resolution of problems, the search for information necessary for its understanding, the exchange of ideas, and the ability to express yourself clearly and defend your own decisions and conclusions.

3.2. COMMUNICATION AND PARTICIPATION IN VIRTUAL WORK ENVIRONMENTS

Clear communication is one of the main bases of work, especially in virtual environments. It is important to have a constant and frequent contact with your colleagues and tutors is, as it will favor your work. For this, at the start of the virtual internship, define the tools that you are going to use with the rest of the team to keep a fluid and stable communication throughout the process.

On the other hand, interacting with the rest of the classmates is essential, since you will not only develop critical thinking, but also share knowledge and experiences, and acquire skills to discuss ideas.

3.2.1. COMMUNICATION AND COLLABORATION TOOLS

During the virtual mobility, it is essential to use different software to communicate with the rest of the team, and thus be able to transmit the information of the work you carry out.

- **JITSI MEET:**

It is a free and open-source video call software that can be used without having to register or install it on your computer. It is fully compatible with all major desktop operating systems: Windows, Mac OS, and Linux. There are also versions for smartphone in iOS and Android, for free.Since it is an open-source software, it is easy to download and install on your browser, so it keeps absolute privacy and confidentiality in videoconferences.The first time it is used for a meeting, you must grant it privileges for the microphone and webcam, and once this step is completed, you can create a virtual room or join a previously created one. For more information, visit: https://jitsi.es/

- **BLACKBOARD COLLABORATE**

Blackboard Collaborate is a simple, convenient, and reliable online and collaborative learning solution designed to offer a level of interaction that makes students feel as if they are in the same classroom, thanks to its collaboration and meeting tools. It is like a virtual classroom that allows students to interact from their desktop, and it can be integrated into various Educational Technology platforms, including "Moodle".

The free version of this APP has several limitations, like a limit of only 4 participants per meeting. For more information, visit: https://www.blackboard.com/es-es/

- **WHATSAPP**

WhatsApp is an instant messaging and quick call application available for smartphones. Its most important functionalities are:

- Messaging.
- Creation of groups, to share messages, videos, photos, etc. and the possibility to configure each group individually (mute, custom notifications, etc.).
- There is a web and a desktop version that allow you to synchronize the smartphone application with any device (laptop, tablet, etc.).
- Calls and video calls can be made just via internet connection (GSM, Wi-Fi).
- The quick-send of pictures, images, or videos stored in the device, or taken with the device's camera on the moment.
- Audio messages recorded with the device's microphone can also be sent.
- Share documents from the application itself.

To complete this information, visit its website: https://www.whatsapp.com/

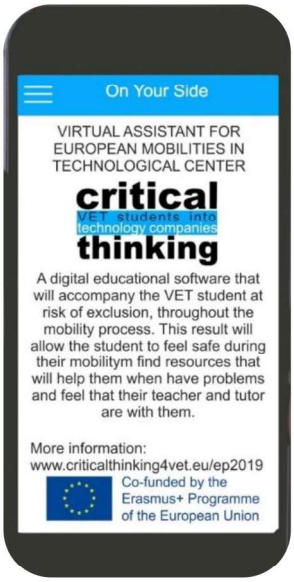
- **SKYPE**

It is a free software that allows you to make calls and video calls both one-to-one and in groups, and to send instant messages and share files between users. Its most significant features are:

- Make high-definition audio and video calls, both one-to-one and in group.
- Send text messages.
- Share your device's screen (in presentations, videos, photos, etc.).
- Record calls and live subtitles, so one can read spoken conversations.
- Make phone calls via internet connection.

For more information: https://www.skype.com/es/

- **APP ON YOUR SIDE**



An educational software for your smartphone, that guides VET students throughout the process of the mobility, from the moment they plan it, until its evaluation through the ECVET credit system. It offers both students and tutors the necessary resources for the development, monitoring, and evaluation of the internship, as well as for their inclusion.

Throughout the process of the internships in the technology company, you will have this free APP that does not only offer you collaborative work tools, specific training tools, or linguistic resources among others, but also enables you to write the laboratory notebook daily.

This digital software has been developed within the framework of the Erasmus+ project "VET STUDENTS INTO TECHNOLOGY COMPANIES" of the strategic network "CRITICALTHINKING4VET".

Download the APP at:
https://play.google.com/store/apps/details?id=com.onyourside.android&gl=ES

3.2.2. CONTENT SHARING TOOLS

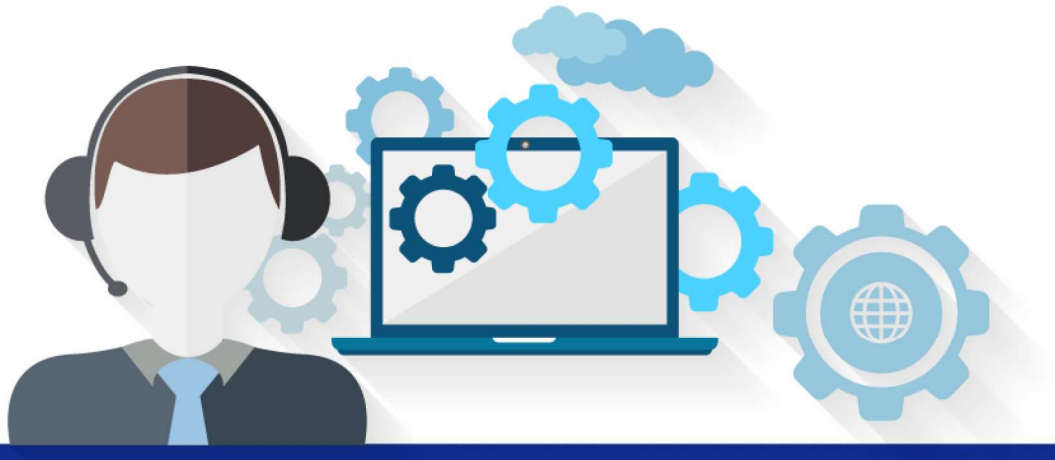
These are all the processes that allow you to exchange contents between the different team members. The main tools are:

- **EMAIL:** Gmail is one of the most used email services today, which makes it easy to exchange information and contents with the rest of the team quickly and easily.
  https://www.google.com/intl/es/gmail/about/

- **DROPBOX:** this cloud file hosting service allows to work as a team and move forward throughout the project in a coordinated and effective way, since it allows to store, synchronize, and share both files and folders.
  https://www.dropbox.com/

- **GOOGLE DRIVE:** it is an online file storage tool that allows you to share work documents with the tutor of the technology company throughout the virtual internships.
  https://www.google.com/intl/es_es/drive/

- **GOOGLE CALENDAR:** an online calendar management tool with which you can schedule meetings with reminders. It allows you to keep track of the dates of the planned activities and objectives, ensuring that you keep a constant track of the schedule.



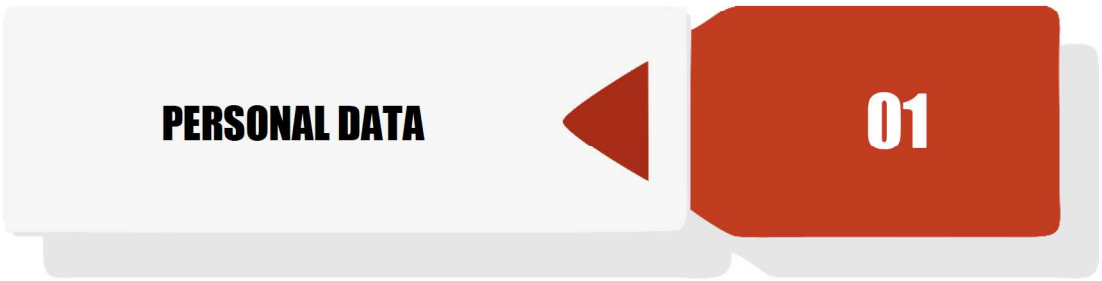
U.D.3. At the end of the virtual job

3.1. FINAL REPORT OF THE INTERNSHIPS

A final report is a document compiling all the activities carried out and the results obtained during the internships. To draft this report, the laboratory notebook that you have filled out daily during the internships will be fundamental, as well as the activity sheets and all the minutes collected from the team meetings. Its wording should be clear and concise, with no convoluted sentences that complicate its understanding.

The tutor of the company will indicate the deadline for delivery of the report. Once delivered, you must present it virtually to your tutors (the company's and the center's) and team members, in a presentation of no more than 30 minutes.

We suggest its index to contain at least the following sections:



- Personal data: name, surname, ID, email, training cycle of the internships, etc.
- Details of the educational center: name, address, tutor.
- Company data: name, sector, VAT nº, address, tutor.
- Working day: the daily and weekly schedule during the internships.
- Work hours: the total hours of work carried out during the internship.

02 INTRODUCTION

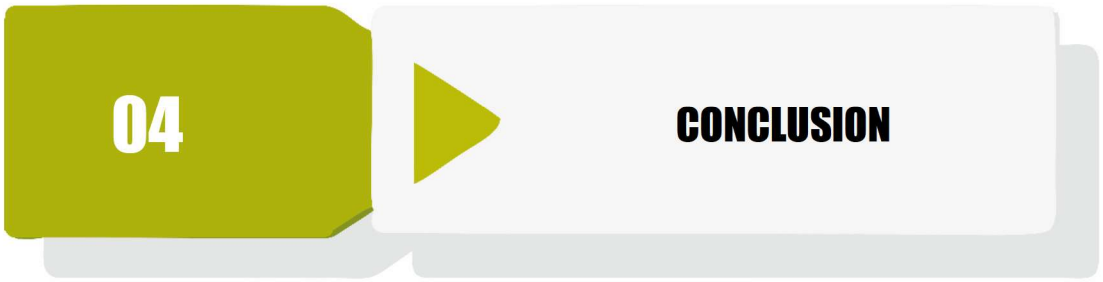
This section should contain the necessary information to understand the context of the project you have carried out, as well as the objectives of both the project and the internships as a whole. It is also here where you can expose the area of the company in which you carried out the internship.

DEVELOPMENT OF THE INTERNSHIPS 03

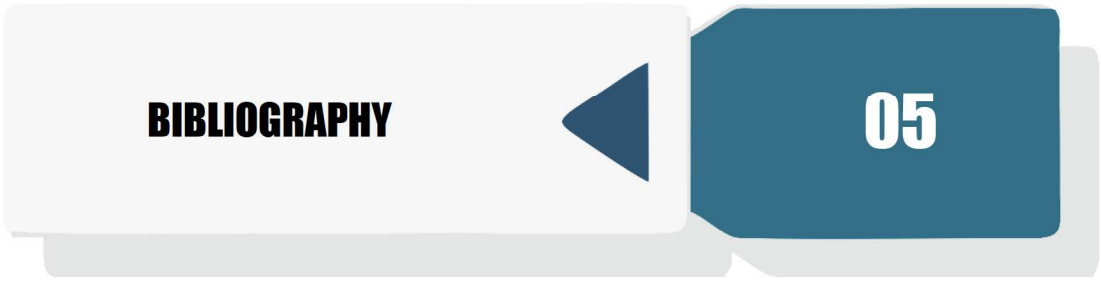
This section is the longest and most important of the final report, because in it you will explain the work carried out. This paragraph shall contain at least:

- The work plan.
- The design; images of the initial and final design. For example: in the case of the job position of “Design and rendering of 3D models”, if you have had to design a piece for printing, include in the final report the initial design from which you started and the final design resulting from your work.
- The activities carried out.
- The results obtained, explaining the final result obtained and highlighting its main characteristics.
- Decisions made; reflect all relevant decisions that both you yourself and the team has taken regarding the project, clearly justifying the reason why they have been adopted.

- Any problems that have arisen and the methods used to solve them.
- Files: if you've had to create user manuals or documents for the understanding of the project, include a link to the folder where they are located and specify its filename. For example, in the case of the "Programming virtual environments" job position, if you've had to create a user manual specifying how it works and the method of use of the environment, include it in the final report.



At the end of the document, synthesize the most relevant points of the project, explaining the importance what you expose. To do this, be careful not to exactly repeat what you've already written throughout the final report, and not to make references to documents that have not been previously cited.



The final report must include the bibliography that you have used to carry out the project, from web pages, digital articles, digital books... It is important to note that every reference to an article, book, document, etc. that you write in the report that is not an opinion must be referenced according to citation rules, since it can otherwise be considered as plagiarism.

3.2. EVALUATION AND VALIDATION OF ECVET CREDITS

The European Credit Transfer System for Vocational Training (ECVET) is a tool created by the European Union in 2009 to support learning, student mobilities, and the flexibility of training pathways. This system allows students to validate and recognize their qualifications and acquired knowledge, either in their same country or abroad. This way, students have the opportunity to integrate learning outcomes more easily into their training.

After completing the virtual mobility, the tutor of the technology company will evaluate your learning results based on the work done and the knowledge acquired based on the signed agreements (the Learning Agreement and the Memorandum of Understanding) and will create a final evaluation report to be sent to the tutor of the educational center to proceed with its validation and recognition of ECVET credits.

The assessment of learning outcomes sets out the extent to which you have actually acquired the knowledge, skills, and competences provided for in the learning agreement signed prior to the completion of the mobility.

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AREA 3

WORK TOOLS

DIGITAL COURSE: ELEARNING SIMULATION ENVIROMENT IN TECH CENTERS

6.3.1. INTRODUCTION

In order to carry out a virtual internship in a technology company, it is necessary to have software packages that allow you to develop the tasks of the project you are going to carry out. However, there are many software that require a single or monthly fee to be used.

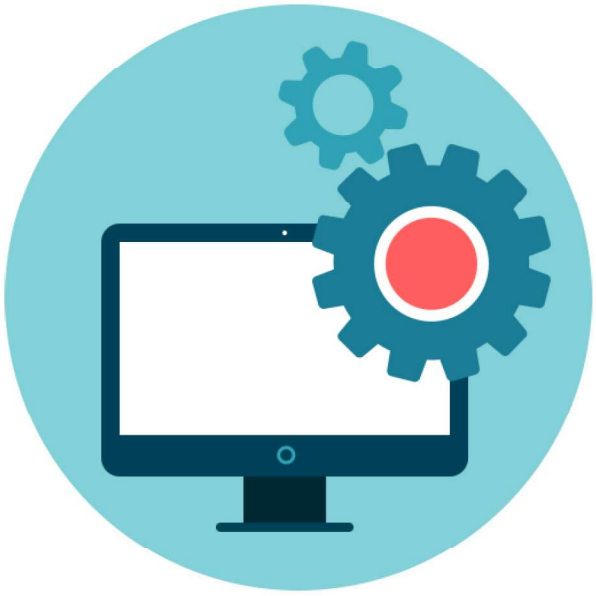
Therefore, to carry out virtual internships, you will use software that does not imply extraordinary costs or the need for high performance devices (those that stand out for their speed, efficiency, and high productivity).

Throughout the Didactic Units of this area you can learn what free software is, but mostly basic notions for the use of the software that you will use in the practical part of the course, as well as in future virtual internships.

6.3.2. OBJECTIVES OF THE AREA

The main objective of this Area 3 of this course is to serve as a guide for VET students -especially those with obstacles- to acquire knowledge about the software used in the simulation of the learning of one of the five jobs in this course.

Also, the objective of these chapters is that you learn to work with tools that you maybe don't know yet and that you may have to use in the future, both in a virtual internship and in a first work experience in the technology sector.



6.3.3. CONTENTS

U.D.1. Free Software and Freeware

1.1. Free software

Free software is any software whose source code can be freely studied, modified, used, copied, and distributed for any purpose. According to the Free Software Foundation (FSF) "*Free software is a matter of freedom, not price. Free software gives the user the freedom to share, study, and modify it*". However, free software is usually available for free.

Free Software Foundation (FSF), founded by Richard Stallman, considered as the "father of open source", is a non-profit organization whose objective is to promote worldwide the freedom of computer users and defend the rights of users of free software.

According to Richard Stallman, for this to be considered free software must have four essential freedoms:

ADVANTAGES OF USING FREE SOFTWARE

- It allows any person interested to collaborate.
- It allows everyone to share and use it.
- It allows to reuse its code for other projects.
- It allows independent security tests.
- It allows software to be more innovative.
- In education, free software facilitates access to very useful learning tools.
- For companies, it allows access to a wide range of software adapted to the needs of each company.

- Purpose: the software may be used for any purpose without license restrictions or geographical limitations. Thus, all users can use the software on any system and for any purpose without the obligation to communicate it to an owner.
- Distribution: the software may be shared and copied for free, with or without modifications.
- Study: anyone can study how the software works.

- Modifications: the software can be modified by any user, and these modified versions can be shared.

One must not confuse the concept of free software with that of freeware; while the first refers to any software whose source code can be executed, modified, used, copied, and shared by any user, the concept of “Freeware” refers to any free software, but does not allow the user to make modifications (all freeware is subject to copyright laws).

Some examples of free software are: Trello, FreeCAD, Ultimaker Cura, Mozilla, Linux, and Open Office; and in the other hand, some of the best known Freeware are: Skype, Windows, iOS, VLC Media Player, or Ccleaner.

U.D.2. Practical notions for the use of free work software

2.1. FREE SOFTWARE FOR THE JOB OF ELECTRONIC CIRCUIT DESIGN

You will make use of free software both in the activities of this course for the design of electronic circuits and in virtual internships in technological companies of the network. You must know the main characteristics of each of these tools, which will allow you to advance faster and acquire more skills and knowledge. You will mainly use:

KICAD

KiCad is an open source software for automated electronic design (EDA) that features an integrated environment for schematic capture and PCB (printed circuit board) design. It was created in 1992 by Jean-Pierre Charras, and since then it has been in continuous development and is currently managed by the KiCad development team.

The main functions of the software are:

- Schematic Capture: a schematic editor that allows you to create everything, from basic structures to complex hierarchical layouts.
- PCB (Printed Circuit Board): a PCB editor that allows you to create both simple and complex designs. It features an interactive router and fingerprint editor, and it allows you to check design rules (DRC) with script support, import/export from other computer-aided design tools, CAD, and adjust lengths.
- 3D Viewer: a 3D viewer that allows to inspect your PCB in order to check the mechanical fit and preview it.

It can run on Windows, Linux, and MacOS, and is licensed under the GNU GPL v3. You can download it through the following link: https://www.kicad.org/download/

Also, the main page of KiCad offers various documents to learn how to use said software: https://docs.kicad.org/

APACHE OPENOFFICE

Apache OpenOffice is a free software for creating texts, spreadsheets, presentations, graphics, and databases available in several languages. This software allows you to access the following applications:

- Writer, to process texts.
- Calc, to create spreadsheets.
- Impress, to create multimedia presentations.
- Draw, to design diagrams and illustrations.
- Base, to create and modify tables, forms, queries, and reports.
- Math, to create mathematical equations.

This software is available for several operating systems, such as Windows, MacOS, and Linux, among others: https://www.openoffice.org/download/index.html

2.2. FREE SOFTWARE FOR THE JOB OF DESIGN AND RENDER OF 3D MODELS

You will make use of free software both in the activities of this course for the design of electronic circuits and in virtual internships in technological companies of the network. You must know the main characteristics of each of these tools, which will allow you to advance faster and acquire more skills and knowledge. You will mainly use:

FREECAD

FreeCAD is a free and open 3D model design software that offers tools to produce, export, and edit solid models of total precision, export them for 3D printing or CNC machining, create 2D drawings and views of your models, carry out analysis like finite element analysis or export model data like quantities or lists of materials.

The main features of this software are:

- It features an advanced solid-based geometry engine, offering a wealth of tools to create and modify these objects.
- All objects are parametric in origin, so they can be based on numerical values, on/off buttons, or other objects.
- The core functionality of the software is coded in C++.
- The user interface is coded in Python, a flexible system that makes it easy to use and understand.
- It allows to import and export models to dozens of file formats (FCStd, STEP, IGES, OBJ, STL, DWG, DXF, SVG, SHP, STL, DAE, IFC or OFF, NASTRAN, VRML, OpenSCAD CSG, etc.).
- It allows you to draw 2D models with geometric constraints.
- This software is developed and maintained by a community of developers, users, moderators, and translators, without any commercial purpose.

This software is available for Windows, MacOS, and Linux. The FreeCAD website offers information on how to download it on each of these operating systems.

- Download the software: https://www.freecadweb.org/downloads.php

It also has tutorials and video tutorials to learn how to use the software more easily:

- Tutorials: https://wiki.freecad.org/Tutorials
- Video tutorials: https://wiki.freecad.org/Video_tutorials

SLIC3R

Slic3r is the tool needed to turn a 3D model into printing instructions for a 3D printer. This software allows you to cut the model into horizontal cuts (layers), generate toolpaths to fill them and calculate the amount of material to be extruded.

This software is an independent, non-profit project, that is not driven by companies or suppliers, developed by a community of people working collaboratively on GitHub. Some of its main features are:

- It is a free and open-source software.
- It is compatible with Marlin, Repetier, Mach3, LinuxCNC, Machinekit, Smoothie, Makerware, and Sailfish.
- It has a codebase that includes more than a thousand unit and regression tests.
- The core of Slic3r is libslic3r, a C++ library that provides a granular API and reusable components.
- It allows you to generate G-codes for FFF/FDM printers.
- It allows you to export to STL, OBJ, AMF, and POV file formats.
- It allows you to automatically repair non-multiple meshes and re-export them.
- It is compatible with several simultaneous printers thanks to a print queue.
- It has integration with OctoPrint (send to printer).
- It has tools for cutting meshes into multiple solid parts with visual preview.
- It has tools for extruding TIN 2.5D meshes.

Like FreeCAD, this software is available for download on Windows, Linux, and MacOS operating systems.

Download link: https://slic3r.org/download/

Also, the website offers a user manual to learn how to use Slic3r.

Link to the user manual: https://manual.slic3r.org/

2.3. FREE SOFTWARE FOR THE JOB OF BUILDING 3D MACHINES

You will make use of free software both in the activities of this course to build a 3D machine, and in virtual internships in technological companies of the network. You must know the main characteristics of each of these tools, which will allow you to advance faster and acquire more skills and knowledge. You will mainly use:

FREECAD

FreeCAD is a free and open 3D model design software that offers tools to produce, export, and edit solid models of total precision, export them for 3D printing or CNC machining, create 2D drawings and views of your models, carry out analysis like finite element analysis or export model data like quantities or lists of materials.

The main features of this software are:

- It features an advanced solid-based geometry engine, offering a wealth of tools to create and modify these objects.
- All objects are parametric in origin, so they can be based on numerical values, on/off buttons, or other objects.
- The core functionality of the software is coded in C++.
- The user interface is coded in Python, a flexible system that makes it easy to use and understand.
- It allows to import and export models to dozens of file formats (FCStd, STEP, IGES, OBJ, STL, DWG, DXF, SVG, SHP, STL, DAE, IFC or OFF, NASTRAN, VRML, OpenSCAD CSG, etc.).
- It allows you to draw 2D models with geometric constraints.
- This software is developed and maintained by a community of developers, users, moderators, and translators, without any commercial purpose.

This software is available for Windows, MacOS, and Linux. The FreeCAD website offers information on how to download it on each of these operating systems.

- Download the software: https://www.freecadweb.org/downloads.php

It also has tutorials and video tutorials to learn how to use the software more easily:

- Tutorials: https://wiki.freecad.org/Tutorials
- Video tutorials: https://wiki.freecad.org/Video_tutorials

ULTIMAKER CURA

Ultimaker Cura is a free and open-source software designed for 3D printers in which you can change printing parameters to turn them into G-code and print these 3D objects on a 3D printer.

The main features of this software are:

- It has an open source cutting engine.
- It can be used with the recommended parameters or in a customized mode in which you can configure more than 300 fields.
- It supports STL, OBJ, X3D, 3MF, BMP, GIF, JPG, and PNG file formats.
- It has a simple and easy to use interface.
- It allows you to download add-ons to customize the print preparation experience.
- It is updated twice a year.

The system requirements to install and use Ultimaker Cura are:

- RAM: a minimum of 4GB, but it recommends 8GB.
- CPU and GPU: it largely depends on the file size of the 3D models, since this software can run on low-end systems.
- Operating System: it is recommended to run the latest version of the software to ensure compatibility. Currently (as of March 2022), Ultimaker Cura is not compatible with APPLE M1 chip.
- Processor: Intel Core 2 or AMD Athlon 64 minimum. However, an Intel Core i3 and AMD Athlon 64 are recommended.

- A minimum of 600mb of space available in the hard drive.
- A graphics card compatible with OpenGL 2 and OpenGL 4.1 for 3D layer view.
- This software is 64-bit and is not available on 32-bit systems.

Download link for Ultimaker Cura on its website, for Windows, MacOS, and Linux: https://ultimaker.com/es/software/ultimaker-cura.

FREEDYN

FreeDyn is a free and open-source simulation software to model mechanical systems. It allows to visualize graphics, diagrams, and animations to develop mechanical structures.

The main features of this software are:

- It allows both importing geometry from a CAD system, as well as designing directly in this software.
- It offers advanced visualization of solutions through graphics, frames, and animations.
- The main modeling elements that the software allows are rigid and flexible bodies, forces and measures, and constraints.

Download the software from its website: http://www.freedyn.at/download/freedyn/

They also offer tutorials to learn how to use it: http://www.freedyn.at/download/tutorials/

2.4. FREE SOFTWARE FOR THE JOB OF LABORATORY TECHNICIAN

You will make use of free software both in the activities of this course for a laboratory technician, and in virtual internships in technological companies of the network. You must know the main characteristics of each of these tools, which will allow you to advance faster and acquire more skills and knowledge. You will mainly use:

GIMP

GIMP is a free graphic design software to for photo editing, image creation, and composition.

The main features of this software are:

- Allows you to create graphic design elements, icons, etc.
- It provides image editing tools, to make corrections, restore, compositions...
- It allows to transform images.
- It supports C, C++, Perl, Python, and Scheme, among others.
- It allows to edit color.
- It supports file formats like JPEG (JFIF), GIF, PNG, and TIFF, among others.
- It allows to upload and save files from FTP, HTTP, SMB, and SFTP/SSH.

GIMP is available for Windows, MacOS, and Linux operating systems via the following download link on its website: https://www.gimp.org/downloads/

Said website also has a user manual available in 15 languages (as of April 2022), and in progress to add more, plus access to tutorials.

Link to the manuals: https://www.gimp.org/docs/

Link to the tutorial: https://www.gimp.org/tutorials/

IMAGEJ

ImageJ is a free and open image processing software with very diverse functions, able to edit contrast, sharpness, smoothing, edge detection, and filtering, among others.

The main features of this software are:

- It allows you to edit, analyze, process, save, and print images in 8, 16, and 32 bit format.
- It reads TIFF, GIF, JPEG, PNG, PGM, BMP, DICOM, FITS, and RAW files.
- It is multithreaded, allowing time-consuming actions to be carried out in parallel.
- It allows to calculate area value statistics.
- It allows to measure distances and angles.
- It allows to create density histograms and line profile graphs.
- It can do geometric transformations (scaling, rotation, and flipping).
- It can display multiple images in a single window.

It can be used online or downloaded, for MacOS, MacOSX, Windows, and Linux: https://imagej.nih.gov/ij/download.html

There are tutorials and user manuals available in its webpage, both in PDF and online.

User manual: https://imagej.nih.gov/ij/docs/index.html

Tutorials: https://imagej.nih.gov/ij/docs/examples/index.html

PSPP

It is a free software designed to carry out statistical analysis, aimed especially at statisticians, social scientists, and students who need to carry out quick data analysis.

The main features of this software are:

- It allows to carry out descriptive statistics, T-tests, linear and logistic regressions, association measurements, cluster analysis, factor and reliability analysis, nonparametric tests, etc.
- It supports multiple variables.
- It allows to import data from spreadsheets, text files, and databases.
- It allows to open, analyze, and edit two or more datasets at the same time.
- It allows for quick statistical procedures.

It is available on Windows, Linux, and MacOS: https://www.gnu.org/software/pspp/get.html

The user manual is available in different formats, like PDF, HTML, ASCII text, TeX dvi file…: https://www.gnu.org/software/pspp/manual/

2.5. FREE SOFTWARE FOR THE JOB OF PROGRAMMING DIGITAL ENVIRONMENTS

You will make use of free software both in the activities of this course for digital environment programming, and in virtual internships in technological companies of the network. You must know the main characteristics of each of these tools, which will allow you to advance faster and acquire more skills and knowledge. You will mainly use:

ADALO

Adalo is a no-code platform that allows to easily develop web APPs without code. It has a free plan to access 200 registries per APP, 1000 monthly APP actions, and 1 APP editor.

The main features of this software are:

- It is based on a system of components.
- It allows you to drag elements and gradually develop an APP.
- It has a powerful database.
- It has extensive functions for user management.
- Integrable with other tools.

Adalo's website offers a set of resources to learn how to use it, such as:

- An online user manual: https://help.adalo.com/
- Tutorials: https://help.adalo.com/how-to
- Videos: https://help.adalo.com/videos
- Actions: https://help.adalo.com/action-basics
- Publish APPs with Adalo: https://help.adalo.com/testing-your-app

APACHE OPENOFFICE

Apache OpenOffice is a free software to create texts, spreadsheets, presentations, graphics, and databases, available in several languages.

Downloading this software gives you access to the following applications:

- *Writer*, to process texts.
- *Calc*, to create spreadsheets.
- *Impress*, to create multimedia presentations.
- *Draw*, to design diagrams and illustrations.
- *Base*, to create and modify tables, forms, queries, and reports.
- *Math*, to create mathematical equations.

This software is available for Windows, MacOS, and Linux, among others: https://www.openoffice.org/download/index.html

U.D.3. Practical notions for the use of management software.

A management software is composed of tools to manage tasks, processes, and projects, offering advantages for project management, such as:

- Increasing productivity while allowing you to manage the cost and time of each task and process.
- It improves collaboration, since it allows everyone to access the most relevant aspects of the project.
- A good monitoring mechanism, since it allows to analyze the progress of the project.

There are many management software packages. However, in this didactic unit we will deal with two of the main free and best known software for project management in companies.

TWPROJECT

This is a tool for project management for small and large companies, universities, and for training. It does not only allow to manage projects, but also record tasks, track issues, have a schedule, team meetings, etc.

Although this software has paid plans, it has a free plan that allows you to use it in small teams of up to five members, and access the following features:

- Unlimited project management.
- Management of tasks and subtasks.
- Management of activities and problems.
- Making basic dashboards.
- Unlimited resources: people, companies, customers.
- Tools like document archive, chat, agenda, charts...

TRELLO

It is a work management tool with which you can not only manage a project, but also design plans, collaborate on projects, organize workflows, and track the project, among others.

Although this software has paid plans, it has free plans for the entire team, which includes:

- Unlimited cards.
- Up to 10 boards per Workspace.
- Unlimited Power-Ups per board. Trello boards allow to integrate other applications and tools used by the team (Google drive, Dropbox…).
- Unlimited storage (10 MB/file).
- 250 Workspace command executions per month.
- Custom backgrounds and stickers.
- Unlimited activity logs.
- Due dates and assigned persons.
- Mobile APPs for iOS and Android.
- Two-factor authentication.

This tool can be used online, on mobile devices and PC. It is also compatible with *Google Chrome*, *Firefox*, *Microsoft Edge*, and *Safari*.

- Download Trello for Android devices: https://play.google.com/store/apps/details?id=com.trello
- Download Trello for iOS devices: https://apps.apple.com/app/trello-organize-anything/id461504587
- Download Trello for MacOS: https://itunes.apple.com/app/trello/id1278508951?ls=1&mt=12
- Download Trello for Windows: https://apps.microsoft.com/store/detail/trello/9NBLGGH4XXVW?hl=en-us&gl=US

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AREA 4

SIMULATION SUPPORT MATERIALS

DIGITAL COURSE: ELEARNING SIMULATION ENVIROMENT IN TECH CENTERS

6.4.1. INTRODUCTION

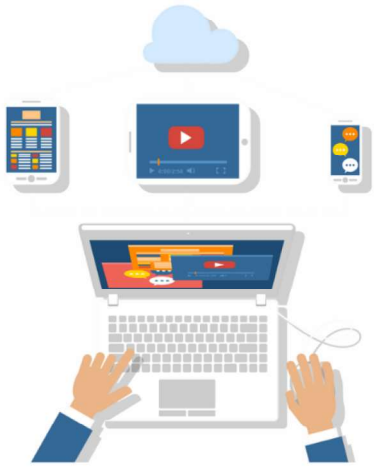
Supporting materials are resources provided to facilitate the completion of the virtual learning simulation. In this case, supporting materials consists of user manuals for each of the virtual environments of the course.

The user manuals are guides that include the main aspects of the simulator, with information on how to use it. These are usually written in a light and easy language, with descriptive images, to easily understand the electronic or computer product they deal with.

Depending on the initial personalization, you will have access to the didactic unit corresponding to the studies you are doing or have completed from the middle degree training cycle.

6.4.2. OBJECTIVES OF THE AREA

This area in intended for VET students, especially those with obstacles, to learn the most important aspects about the management of the learning simulator that you are going to use in the practical part of the course, and in which you can have a first experience about how future virtual internships in technological companies of the network will be.



6.4.3. CONTENTS

INTRODUCTION

This is the student's guide that will help you navigate the private e-learning environment area, in which you will experience the simulation of activities with the characteristics, structure, equipment and software of a job position in a technology company. These tasks are realistically designed according to the role that you could have during a future internships in such companies.

This way, when starting your mobility period, you will already have a previous expertise that will help you be effective in the real company environment.

1. INITIAL TEST

The first step to access the digital course that will lead you to the job simulator is to take an initial test. The test is aimed at defining your field of interest and at evaluating your level of expertise.

You will find 24 multiple-choice questions and after answering them all you will be redirected to a registration form, according to the field you have selected as that of your interest.

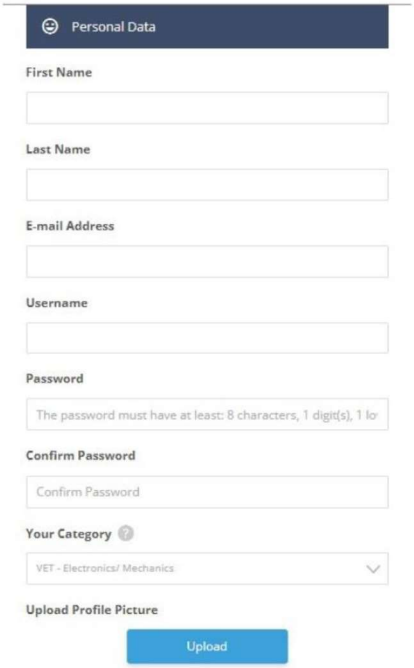
The five areas are the following:

- Electronic circuit design.
- Design and rendering of 3D models.
- Construction of 3D printing machinery.
- Materials characterization protocols.
- Programming of digital environments

2. REGISTRATION

Insert your data and choose a username and a password to access the platform. Use a strong password. if you want, you can also upload a profile picture here.

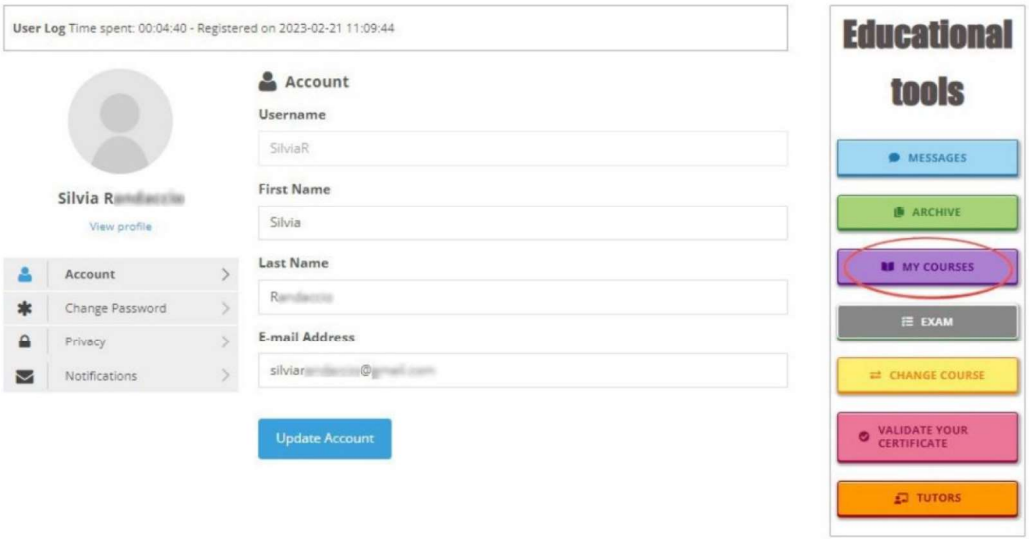
You will receive a welcome email and from there on you will be able to access your personal page.



3. PERSONAL AREA

You now have access to the platform where you can download the study material and access the job simulator.

On the left side of the page, you can see your personal information, while on the right you will find a column menu called “Educational tools”. From this menu you can access all the resources available to carry out your virtual internship.

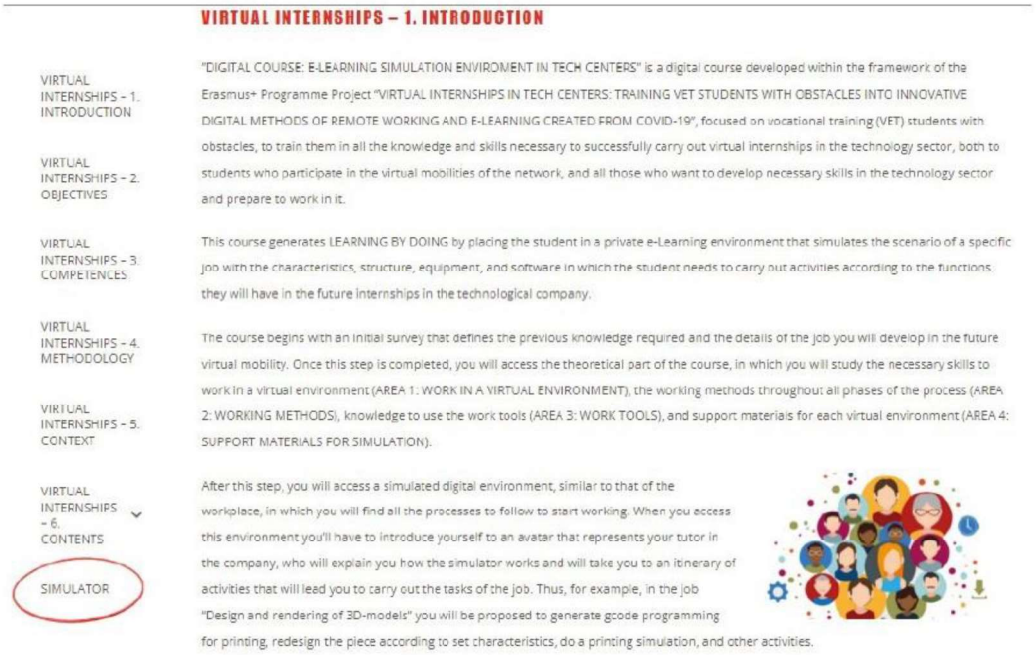


3.1 My courses

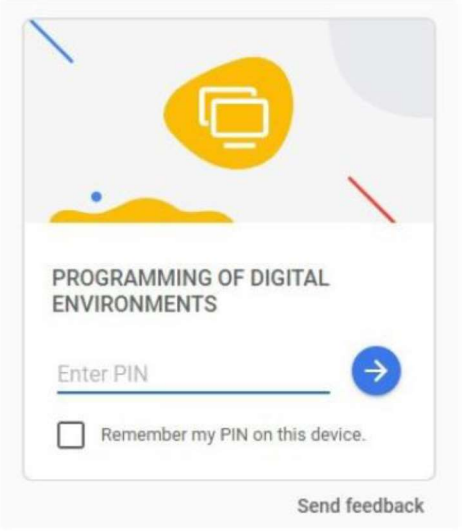
By clicking on “my courses” you will enter the page dedicated to the study materials where you will find a series of documents explaining you the methodology of this course.

We recommend you read them carefully before starting to interact with the simulator because they will help you get oriented on the virtual internship path.

Once you are done with the theoretical part, you can access the virtual simulator by clicking on the relative item on the left menu, as shown in the picture below.



4. Access the job simulator



You will be redirected to the restricted area where you can access the virtual working environments. According to your field of studies, select a specific environment to start your virtual internship simulation.

To access the environments, use **Chrome browser** and follow these instructions:

(1) if you are not logged in into Chrome, log in with the credentials *elearning.simulator* (password *simulatorKA226*); if you were already logged in, click on your avatar at the top right and select "add another account", then use the credentials above;

(2) you will see five environments: select the one you want to access, by clicking on it;

(3) enter the pin 000000 if required (same for all environments);

(4) if you are asked to login with "Admin" user, input the password 12345;

(5) you're in!

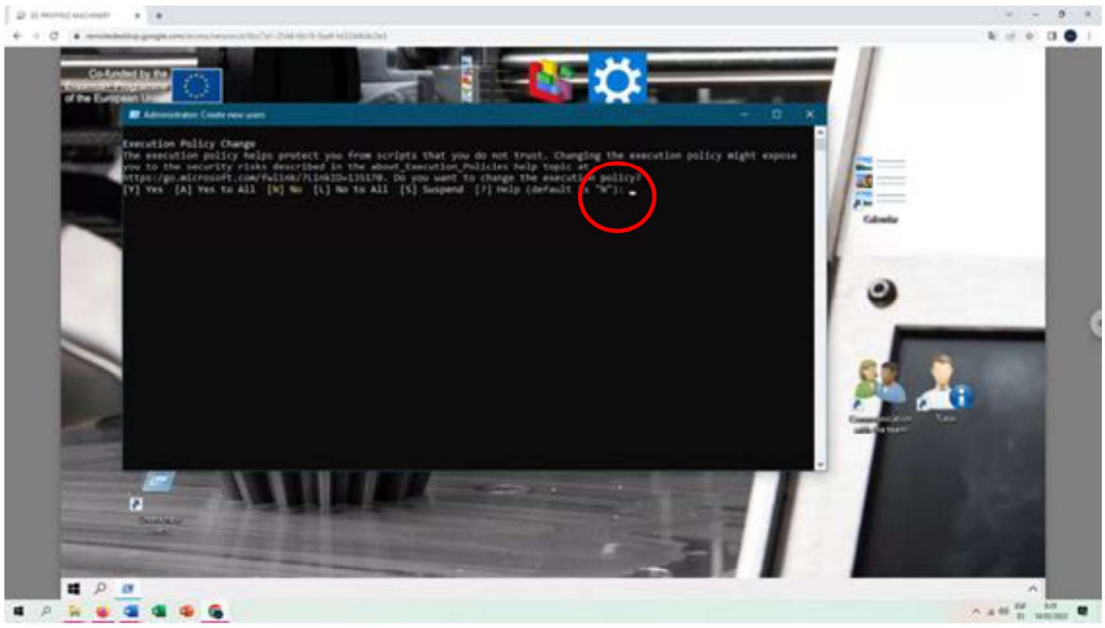
As you can see, the simulator perfectly replicates the desktop of a Windows PC (see image below; note that the background picture and the contents changes according to the selected environment), with all its main functionalities.

You find a description of the most relevant ones (with the simulator in mind) in the following paragraphs.

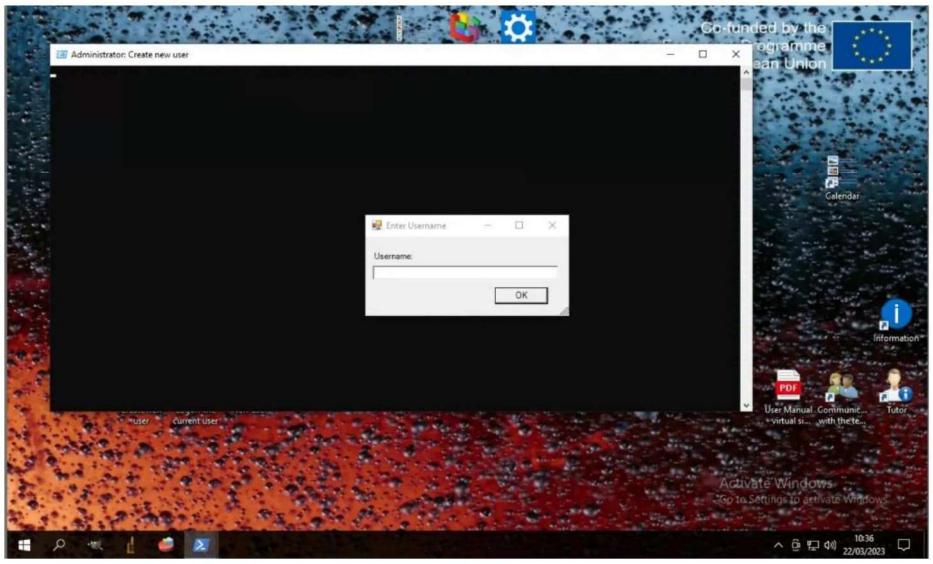
5. CREATING A NEW USER

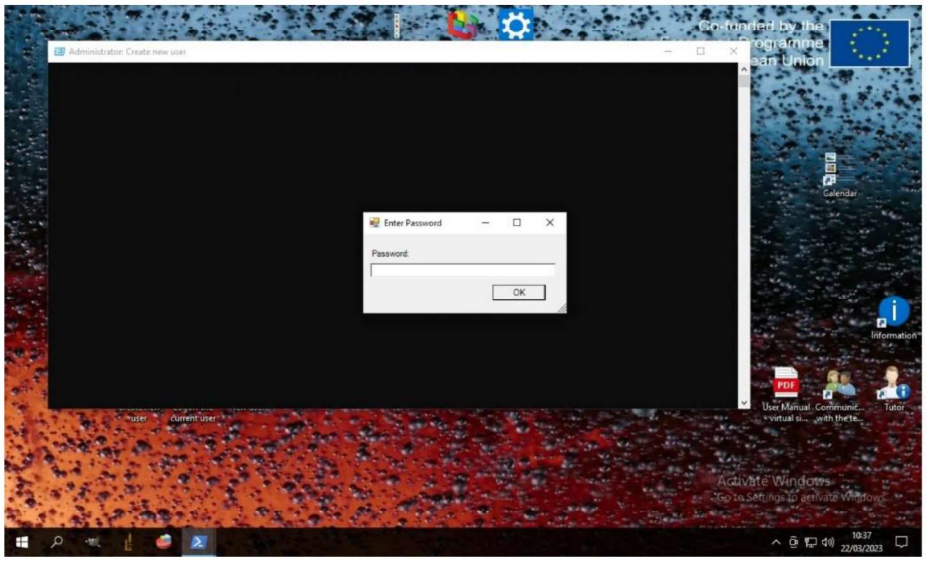
At your first access, you will have to create your own user, which you will use from now on to log into the simulator, instead of the default Admin user as explained in paragraph 4, point (4).

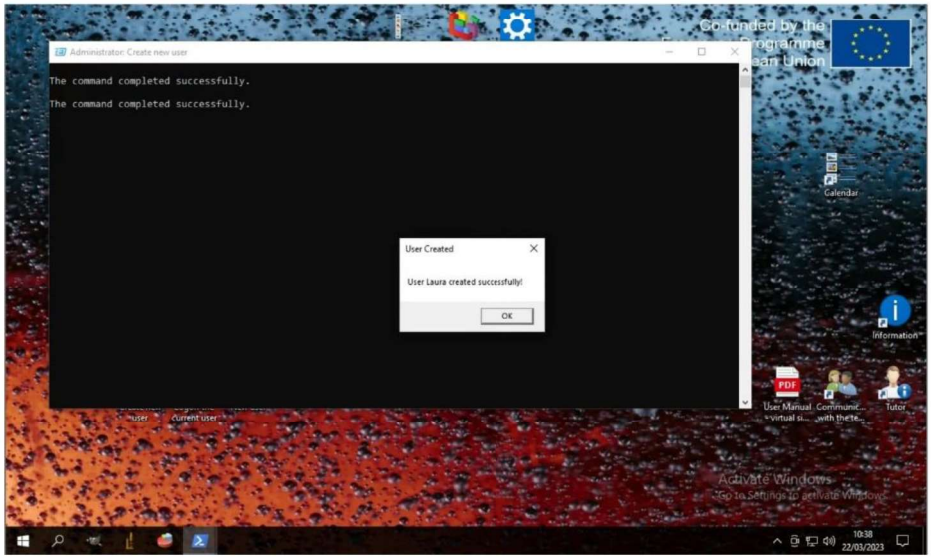
In order to create a new user, right click on the icon “Create new user” and select “Run with PowerShell”: In case the following window appears (see image) you must write "N" in the empty field:



A new window will open directly that will allow you to create your new user.







5.1 Logging in with your user

Once you have created your user, log out from the Admin account and back in with your own. In order to log out, right click on the icon “Logoff” and select “Run with PowerShell”. From now on, at all your subsequent accesses to the simulator, please use your own credentials instead of the default Admin ones detailed in paragraph 4, point (4). You will find your user listed with all the others for that specific

environment of the simulator, when you access it (point (3) in paragraph 4).

The newly created user replicates exactly the default one, with all the content and functionalities needed to carry out the simulation of your virtual internship.

The first time you log in, your simulator's timer will start. If it doesn´t, right-click on the "New User" icon and select "Run with PowerShell". Once you have selected this icon for the first time and the simulation counter starts, it will disappear from the desktop.

6. CARRYING OUT YOUR VIRTUAL INTERNSHIP SIMULATION

In your remote desktop that simulates the working environment you will find different resources, tools, and materials.

The following paragraphs explain each item in detail.

6.1 Timer

Starting from your fist login, each time you enter the simulator a countdown timer starts and, each time you log off from the simulator, the timer pauses.

Because you have nine days in total to carry out the three activities that the simulator consists of, the timer is there to remind you how much time you have left, and as time passes it triggers pop-up messages from the avatar of your tutor, represented by the silhouette of a person located on the desktop, at the bottom right.

6.1.1 Pop-up messages from your tutor

As mentioned in the previous paragraph, messages from the avatar of your tutor pop up on a time basis, to give you tips on how to carry on the activities, or to remind you how much time you have left to carry out the activity you are currently working on. At the end of the third activity, the tutor will give you the link to access the final exam. Please note that you cannot click directly or copy and paste from the tutor's messages, so you will have to input the link into your browser yourself.

If you need a reminder, you can review the messages you got from your tutor by double clicking on his icon to force the messages to pop up.

6.2 Icons on your desktop

As mentioned, the simulator replicates the desktop of a PC:

- You can find a clock, a calendar and seven more icons.
- The two at the bottom left ("Create new user" and "New user") were described in the previous paragraphs.
- The two at the bottom right ("Tutor" and "Communication with the team") let you access important messages and tips on how to carry out your activities.
- While the three at the top center of the desktop contain the material and tools that you will need throughout the simulation to carry out the assigned activities.

6.2.1 Tutor

The functionality of this icon was described in paragraph 6.1.1: by double clicking on it, you manually force some pop-up messages with advice from your virtual tutor.

6.6.2 Communication with the team

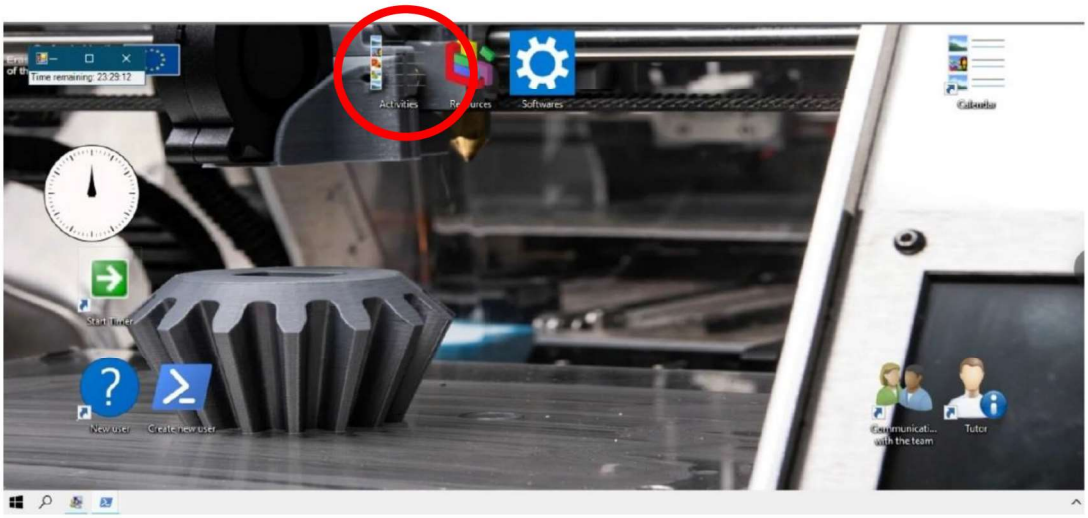
This icon has a similar function to the one described in the previous paragraph: by double clicking on it, popup messages come up, that include more technical and detailed messages, with descriptions and pieces of advice, about the activities that you are required to carry out throughout your simulation.

6.2.3 Activities

Each simulated internship involves carrying out three activities related to the field of studies of your choice.

These are described in detail in the doc or pdf files that you can find in the “Activities” folder on the desktop of your simulator and will typically involve the use of one of the softwares relevant for your field, as described in paragraph 6.2.4. Depending on your field of studies and on the nature of the exercises proposed, the folder may contain additional files to be opened using one of the mentioned softwares.

The final exam will deal with the notions you have learned in carrying out these activities and exercises.



6.2.4 Softwares

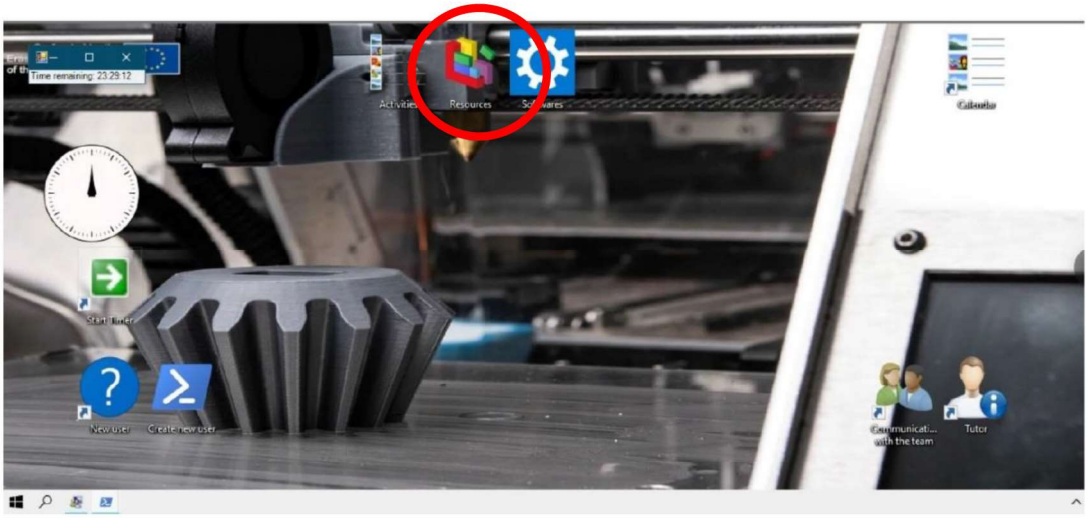
This folder contains the launchers for any software deemed necessary for you to be able to carry out the activities assigned. These software is pre-installed on the simulator so you don't have to worry about anything but running it, by double clicking on the relative icon.

6.2.5 Resources

This folder contains user's manuals, tutorials or comparable resources to help you familiarize with the software that you are required to use in carrying out the three activities of your simulated internship.

We suggest you take some time to go through these documents before you start approaching the actual activities, to make sure you gain some familiarity with the

software that you are going to be using throughout the entire duration of your simulated internship.



7. FINAL EXAM

As mentioned before, at the end of the third activity the tutor's avatar will provide you with the link to access the final exam, that will deal with the notions you have learned in completing the activities.

Please note that you cannot click directly or copy and paste from the tutor's messages, so you will have to input the link into your browser yourself.

In order to access the exam, that is hosted on the Virtual Inclusive Education (VIE) platform, you are required to be logged in into the platform with your account (see paragraph 2).

There are five different exams, one relative to each of the areas (and to each of the simulators). Your tutor will provide you with the link to the one appropriate for you.

The exam consists of multiple-choice questions and at the end of it you will be given a score based on which you will have passed or failed the exam. If you pass, you will be able to generate and download a pdf certificate relative to the study itinerary you have just completed.

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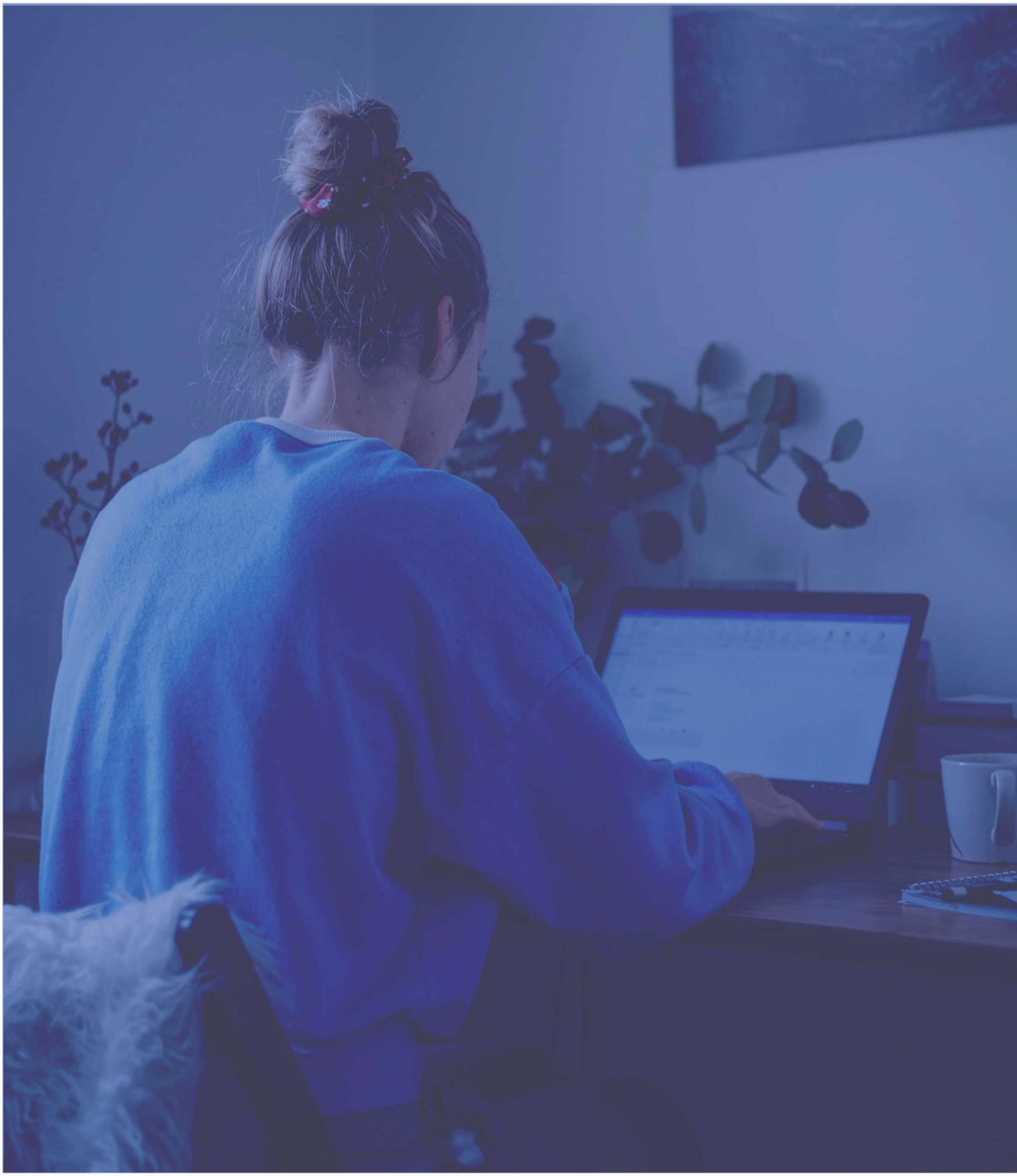

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