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**critical**  
FUTUREVET  
**thinking**

# MANUAL

## A NEW VET MODEL, A NEW OPPORTUNITY FOR THE TECHNOLOGY SECTOR



SOMATICA  
MATERIALS & SOLUTIONS



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# intro

## INTRODUCTION



However, the path to implementation of this new law is not easy.

In view of the challenges experienced since 2020, the European Commission has decided to promote Vocational Training by making it a benchmark for economic and social reconstruction, as well as to achieve the objectives expressed through the Council Recommendation of 24 November 2020 (2020/C 417/01) and coinciding with the 2030 Agenda and the OECD proposals. Member countries have started to adapt their VET education laws to the new guidelines in order to achieve the proposed objectives.

This is the case of the Government of Spain, which in 2022 approved the new Organic Law 3/2022, of 31 March, on the organisation and integration of Vocational Training for the modernisation of Vocational Training in Spain with the aim of improving standards and making VET more attractive to young people.



All this, through the introduction of flexible learning pathways, as well as the updating and development of new educational programmes that meet the demands of the future of the labour market. The new VET model seeks to guarantee learning opportunities for all with a unified, flexible and easily accessible system.



With this new model, companies must not only assume the hosting of internships for VET students of a longer duration than the current one, but they must also assume part of the specific training of the student's degree in the company.

For this reason, it is essential that schools have tools to explain to companies how the new model works, but, above all, what it means for them, and to get them to take in internships from their VET students.

In this context, with this Manual, created within the framework of the Erasmus Plus project "BUILDING THE VOCATIONAL TRAINING OF THE FUTURE: COMPANIES AND EDUCATIONAL CENTERS FACING THE CHALLENGE OF THE ORGANIZATION AND INTEGRATION OF A MORE INCLUSIVE AND DIGITAL VET." we seek to offer teachers and Vocational Training educational centers guidelines and suggestions to ensure that technology companies understand the new model of VT and are interested in hosting internships of students from Vocational training.



# THE NEW VOCATIONAL TRAINING MODEL

**What is important to explain to technology companies about the new VET model?**



**1**

## **The co-responsibility of the company with the educational center**

With Law 3/2022, Vocational Training becomes dual, highlighting the co-responsibility of the company and the educational centre in terms of student training. With the new model, training periods in the vocational training centre will be combined with training periods in companies.

**2**

## **Dual training**

Currently, dual Vocational Training can be general or intensive, depending on the characteristics of the training period in the company.

3

### What is the duration of the training period in the company?

**General character:** 500h in total (between the first and the second year). In the first year the training periods will take place preferably between March and June and will last between 120h and 240h; in the second year the periods will take place preferably between January and March and will have a minimum duration of 260h and a maximum of 380h.

**Intensive character:** 700 hours in total (between the first and second year). During the first year students will have to complete 335 hours, while during the second year they will complete 365 hours.

4

### What is the percentage of training results that the company has to assume?

**General character:** between 10% and 20% of the learning results of the whole training cycle (not of each module) during the training periods.

**Intensive character:** between 30% and 35% of the totality of the learning results of the whole training cycle (not of each module).

5

### Does the company have to assume the Social Security costs?

Companies will **not** be responsible for the students' social security registration during the training periods, since the competent administrations will be responsible for this management.[1].

[1]Orden EFD/657/2024, de 25 de junio, por la que se determina el currículo y se regulan determinados aspectos organizativos para los ciclos formativos de grado medio en el ámbito de gestión del Ministerio de Educación, Formación Profesional y Deportes.

## 6

### **What will be the responsibilities of the company's dual tutor?**

It is necessary to approach the role of the tutor in a realistic way if the process is to be effective. For this reason, our methodology focuses on the autonomy of the student in their training. Of course, the tutor will be key when it comes to guiding the learning of both these techniques and the learning outcomes, but the training and monitoring notebook of the training plan that we propose is already in itself a guide for the student to discover the methods of autonomous learning.

Each student will be assigned a dual company tutor. The latter will be responsible for:

- Identify the learning outcomes of the training plan to be carried out in the company.
- Ensure that the student will have the necessary resources at their disposal.
- Design the student's activities in their workplace and also the training activities aimed at achieving the expected learning outcomes with the tutor of the educational center.
- Be aware together with the educational center of the selection of students, respecting the principle of equal opportunities.
- Monitor the acquisition of learning outcomes, in collaboration with the school.
- Adapt the training plan to the progress and specific characteristics of each student and in particular to the inclusion of students with obstacles.



7

## Does the company have to sign agreements with the educational center?

Yes, in order to carry out training periods for vocational training students in companies, the educational centre must sign a collaboration agreement with them. This agreement, included in ANNEX V-C of Order EFD/657/2024, of 25 June, establishes the commitment of the company and the educational centre to the development of the student's Training Plan.

Thus, it identifies the centre, the company and the place of work where the student is going to carry out the period, the objective of the agreement, the characteristics of the training plan, the duties and rights of those involved (company, educational centre, tutors of the company and the centre), the causes of termination and the period of validity.

### Acceso



8

## What resources can we offer to the technology company?

In the framework of the Erasmus + “FUTUREVET” project, we have developed several resources to support technology companies in hosting training periods for VET students with obstacles.

### **Course for technology companies: How to implement new mobilities**



An e-learning course for technology companies that presents a methodological proposal for the training of a VET student during his/her stay in the company.

## **Practical guide for the implementation of the new VET in technology companies**



A guide for technology companies with all the steps and recommendations to successfully implement the new model of Vocational Training in your company and host training periods and international mobilities of VET students with obstacles.

## **Training plan template**



The Government in Order EFD/657/2024, of June 25, has established a model of Training Plan which details the learning outcomes to be carried out both in the educational center and in the company, the time distribution and working day and the data of the entities and persons involved. However, this model does not include the student's activities in a technology company or how the training will be acquired. Therefore, we propose to expand this training plan, creating a template that allows not only to carry out the training of the student in the technology company, but also its monitoring by the company and the educational center. All this through the programming notebook, a digital document that the student fills in throughout his/her stay in the technology company.

## **Training plans carried out by technology companies**

The teams of 3 technology companies in Spain, Portugal and Italy, after the completion of the course for technology companies and following the template of the training plan, have created their own plans for the reception of VET students with obstacles in the fields of IT and electronics.

- Ikasia Technologies SL 
- Smallcodes Srl 
- Somatica, Materials & Solutions 



# HOW TO CHOOSE A COMPANY TO CARRY OUT MOBILITIES



Choosing the technology company for students to carry out mobility/training periods is a process that involves a combination of important criteria.

Choosing the technology company for students to carry out mobility/training periods is a process that involves a combination of important criteria. These factors, although they do not have a specific order of priority, are key to ensuring that both the student and the company get the maximum benefit from the mobility.

First of all, we must decide whether the training period will take place in the student's region or whether he or she will carry out a mobility abroad. There are several aspects that we must take into account when offering this possibility to students, such as the level of language, the ability to travel for a period of time, the obstacles they face...



In these cases, the **grants of the Erasmus Plus Programme** are a fundamental tool to ensure that students with obstacles carry out international mobility in technology companies. Thanks to these subsidies, these students have their travel, accommodation and living expenses covered, guaranteeing their full inclusion.

On the other hand, an **international mobility** offers many advantages to students such as the possibility of participating in innovative projects of technology companies in Europe, having a first experience of emancipation, improving language skills...

Another aspect that we must take into account when selecting the technology company that best suits our students is their individual needs.

In addition, the chosen company must be committed to the student's training and professional development. We seek that the student participates in a project and acquires the expected training, both at the curricular and work level.





## *Strategies for finding technology companies*

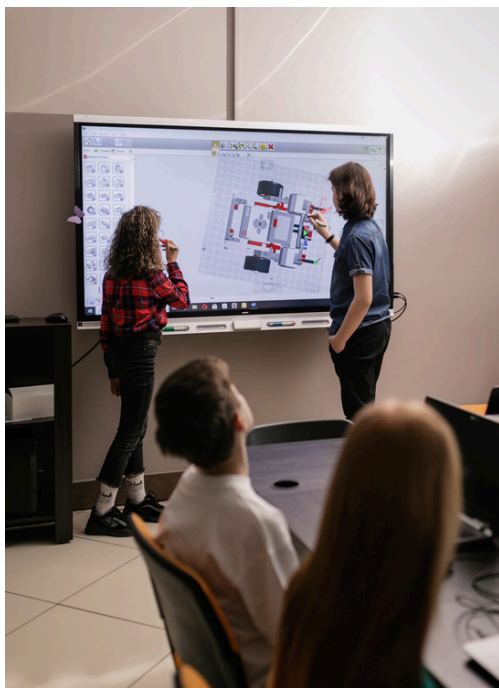
- Use the **school's network** of contacts.
- Search on **specialized platforms** to find technology companies. For example: the VET4TECH Platform, a search system that allows you to find VET schools, technology companies and research centers for both virtual and face-to-face mobilities of students in computer science, mechanics, electricity and electronics and chemistry.



- **Research** technology companies at local, regional and national level that stand out in the training areas, such as software development, mechanics, electricity...
- Once the technological companies that we consider suitable have been identified, the educational center should **contact** them to propose the hosting of training periods for the students.
- After this first contact, it would be useful to propose an **initial virtual or face-to-face meeting** to discuss the characteristics of the training period in more detail. Throughout the process, different types of meetings are key to ensure effective collaboration. Initial training meetings, where the details of the training plan and the responsibilities of both parties are presented, are essential.
- In the case of international mobilities, **preparatory trips** to the host technology company are very useful to get to know the facilities, the company's tutor and the team of technicians with whom the student will be working.
- It is also useful to prepare **detailed documents** specifying all the characteristics of the training periods and the involvement of the company. In this regard, the working group of the Erasmus Plus project "Building the vocational training of the future: companies and educational centers facing the challenge of the organization and integration of a more inclusive and digital VET." has created a "Practical guide for the implementation of the new VET model in technology companies".



# WHY DO AN INTERNSHIP IN A TECHNOLOGY COMPANY?



Hosting VET students with obstacles with Law 3/2022 in Spain can offer advantages for technology companies.

With the new model, companies assume a more active role in the training of students. Although at first glance it may seem that it is too high a burden for the company, technology-based companies are in an advantageous position to contribute to the training of VET students in a wide range of skills, beyond those strictly linked to the specific position they occupy during their stay.

When looking for technology companies to welcome our students, it is essential to show them the advantages that this collaboration can offer them so that they understand the added value of being part of this process and are encouraged to take the step towards collaboration with the educational center.

# What are the most relevant advantages to convey to the company?



1

## **Possibility of expanding the workforce**

The rapid development of new technologies associated with many productive sectors means that companies need a significant number of professionals with specific training in specific areas. This is especially clear in the sectors related to the digital, ecological and energy transitions in which Europe is immersed. Large companies, which usually need to hire workers every year, may be interested in participating themselves in the training of professionals oriented to their needs in addition to selecting the most promising students to give them continuity in the company. The challenge for the development of new vocational training is to incorporate small and medium-sized enterprises into the system whose possibilities of increasing their workforce are more limited, although, however, for them the problem of incorporating new technologies is probably no different from that of large companies. Technology-based companies are innovative companies that require highly creative professionals, with transversal skills such as autonomous learning, group work, and critical thinking. These companies may be interested in participating in the training of VET students and in being able to select the students most open to this type of training and professional career.

2

## **Access to the Vocational Training system will help the training of the company's own workers**

This is an aspect that can be interesting to highlight to the company. Participating in the training of VET students in the company will develop new teaching methodologies that can be used by the company's workers for their continuous training.

In this sense, it is especially important that the company is responsible for specific learning outcomes of the degree. In the Erasmus Plus project "Building the vocational training of the future: companies and educational centers facing the challenge of the organization and integration of a more inclusive and digital VET." We launched a methodological proposal based on helping students acquire autonomous learning and critical thinking skills that can be used throughout their professional lives.

### 3

#### **Access to training methodologies that facilitate the reception of mobilities**

We are aware that for the tutor of the technology company it is an extra effort to prepare the training plan for the students, but with the methodology created within the framework of the Er+ project "Building the vocational training of the future: companies and educational centers facing the challenge of the organization and integration of a more inclusive and digital VET" it is significantly easier for the company to program training activities for the students. and the students. The technology company can program the activities and the work methodology in such a way that it encourages them to consider the objective of their work for the company, the reason for the tasks that lead to achieving that objective, the physical, chemical, mathematical, legal principles etc. that govern the operations they carry out.

### 4

#### **Reduced workload**

Although it is true that at the beginning of the mobility students require training time in the company's working methods, they can later become a very important asset for the company, helping in the performance of workers' tasks while learning and acquiring key skills to work in the company.



## 5

### **Support for inclusion**

Hosting mobility of VET students with obstacles offers companies the ability to promote the inclusion of these students and give them a real opportunity to access the labour market.

## 6

### **Creation of synergies with the education sector**

Collaboration with educational centers to participate in the training of these students facilitates early contact with emerging talent, favoring the recruitment of professionals with up-to-date technical skills, which is crucial in a constantly evolving sector such as technology. And also in the opposite direction, collaboration with educational centers will provide the company with training opportunities for its own workers.

## 7

### **Receipt of aid**

The Ministry of Education and Vocational Training of Spain and the competent regional administrations will have the possibility of calling for aid aimed at companies and equivalent organizations "in the format of training programs in companies".[2]

[2] Real Decreto 659/2023, de 18 de julio, por el que se desarrolla la ordenación del Sistema de Formación Profesional. Artículo 52.



# PROFILE OF THE STUDENT INTERN: THE VALUE OF SELF-IMPROVEMENT



One of the biggest diversification experiences for young people is mobility and study abroad activities, which have become one of the main diversification experiences, receiving more and more attention in recent years.

The profile of students participating in the mobilities of the CRITICALTHINKING4VET network is that of vocational training students at risk of exclusion from disadvantaged areas of Spain, France and Greece, from the Intermediate Level Training Cycles of technological and scientific branches, such as electricity and electronics, mechanical manufacturing, computer science or chemistry laboratory.

These are students who, due to the obstacles they face, have greater difficulties in inclusion and employability.

For them, mobility is an essential opportunity for their future. They are dynamic, proactive people, with a lot of motivation to learn and adapt to the company, as well as with the ability to demonstrate skills, knowledge and attitudes relevant to companies, which make them possible candidates to become employees after completing the mobilities.

They are people who seek opportunities beyond the borders of their home country, looking for what they do not find locally.

In most cases, professional internships or mobilities are the first contact of these students with the world of work, in which, in addition to putting into practice the knowledge acquired, they have the opportunity to acquire key and transversal competences that are fundamental for their access to the labour market.





# INNOVATION



## THE VOCATIONAL TRAINING CENTRE AS A SUPPORT FOR INNOVATION



To encourage students towards innovation, it is essential that their training takes place in innovative environments.

At all levels of vocational training, a student will be more likely to seek to acquire the necessary skills to be innovative if they see that their teachers and classmates are involved in research and/or development projects with applied, defined and innovative objectives, in collaboration with companies or on their own.

With the new Vocational Training model, schools play a fundamental role in supporting applied innovation and research. To this end, schools must include in their educational plans initiatives that not only strengthen the technical training of students, but also promote research in key areas such as technological innovation, digital transformation, immersive technologies and advanced learning methodologies.



Vocational Training centres have the capacity to support technological innovation and applied research through the development of projects that involve collaboration between the educational centre and companies and research centres.

The collaboration between both sectors (education and technology) not only allows the educational center to adapt the training needs of students focused on their employability, but also the implementation of active methodologies that allow students to acquire teamwork skills, entrepreneurship, and key skills for their access to the labor market.

In the field of digital transformation, VET centres have a decisive role to play in preparing future professionals in data management, process automation and the integration of digital solutions in different sectors.

On the other hand, immersive technologies can improve educational processes, making it possible for students to experience simulated work environments or interactive internships that enhance their learning.

In this sense, we propose the methodology of SIMULATION OF WORK LEARNING, a practical job training methodology that places the student in a scenario that simulates a job in a technology company where he or she must carry out various tasks related to the functions that he or she will have in future virtual internships in a technology company[3].



[3] L. Gómez Estrada, L. Pietra, S. Randaccio, C. Zoli, V. García Ortuño, R. Navarro Cerverò, P. Carrolaggi, P. Karampelas, J.S. Nunes, C. Solano Martínez, L. Gómez Estrada, J.L. Gomez Ribelles (2022) VIRTUAL INTERNSHIPS IN TECH CENTERS, EDULEARN22 Proceedings, pp. 1931-1938.



## Finally, the new VET model emphasises the adoption of advanced learning methodologies, including project-based learning, collaborative learning and simulation.

These approaches allow students to develop transversal skills such as teamwork, critical thinking and the ability to innovate, fundamental aspects for their employability in the technology sector.

In this sense, we propose the "Being a Part of It" methodology, a method that makes the classroom of the educational center a virtual R+D+i cabinet of the company. It is the company that proposes a project in which an innovative design is sought, for example. The students carry out the work organized according to the company's rules and directed remotely, with digital tools, by a company tutor and with the help of the teacher in the classroom. [4][5]

[4] L. Gómez Estrada, L. Pietra, L. Gómez Estrada, S. Randaccio, C. Zoli, R. Sixto Iglesias, R. Navarro Cerveró, J. Nunes, P. Carrolaggi, P. Karampelas, J. Tormos Capilla, J.L. Gómez Ribelles (2023) TECHVETLAB: TURNING THE VET CLASSROOM INTO A VIRTUAL DEPARTMENT OF A TECHNOLOGY COMPANY, EDULEARN23 Proceedings, pp. 1257-1264.

[5] L. Gómez Estrada, L. Gómez Estrada, L. Pietra, S. Randaccio, C. Zoli, R. Sixto Iglesias, R. Navarro Cerveró, J. Nunes, P. Carrolaggi, P. Karampelas, J. Tormos Capilla, J.L. Gómez Ribelles (2023) THE "BEING A PART OF IT" METHODOLOGY: VET STUDENTS PARTICIPATING IN RESEARCH PROJECTS FROM THE CLASSROOM, ICERI2023 Proceedings, pp. 2337-2341.





# SCHOLARSHIPS AND INSTITUTIONAL SUPPORT PROCESSES FOR MOBILITIES

## The Erasmus Plus programme

The Erasmus+ programme offers mobility programmes aimed at study, training, work experience or volunteering abroad for students and teachers. These programs are offered for school education, vocational training, and higher education.

Specifically, in the case of Vocational Training, these programmes promote the mobilisation of VET students and teachers, as well as the creation of strategic networks between companies and educational centres. These mobilities can be intended to carry out very diverse activities such as practical training periods, courses and training, learning by observation...

There are two types of mobility projects: short-term and accredited projects for mobility.

## **Short-term projects**

Short-term projects are intended to carry out activities in a simple way and to gain experience within the E+ programme. These are projects of between 6 and 18 months that can be applied for by VET educational institutions, local and regional public authorities, coordinating bodies, companies and other public or private organisations that host or work with VET students.

## **Accredited mobility projects**

These are projects that can be requested by organisations that have Erasmus accreditation in Vocational Education and Training, whose initial duration will be 15 months (extendable to 24 from 12 months). These applications are based on an Erasmus plan that has been previously approved.

The main purpose of the student mobilities funded by the Erasmus+ Programme is to support internationalisation, increase employability, develop skills and competences, as well as improve their job prospects, thus contributing to the improvement of the quality of education and Vocational Training. In addition, they reinforce the European dimension of teaching and learning through the promotion of the values of inclusion, diversity, tolerance and democratic participation and knowledge of European heritage.

## National support

In addition, in the specific case of Spain, on 29 August 2023, the Ministry of Education and Vocational Training, in the Resolution of the General Secretariat for Vocational Training dated 29 August 2023, announced grants for the development of innovation and research projects in the field of Vocational Training led by vocational training centres supported by public funds and with the participation of companies or entities.

The project requested must be made up of a minimum of 2 vocational training schools from different autonomous communities or cities and 1 company or entity.

In this sense, the following may be beneficiaries of these grants:

- Public Vocational Training Centres.
- Private centres that have an educational agreement with the education administrations to provide vocational training.
- Public or private companies.
- Public bodies.
- National Reference Centers.

These are projects *"with the capability to generate, share and mobilise knowledge, products and resources of social and economic utility between vocational training centres, companies and participating entities"*[6].

As established in the fifth section of this resolution[7], the projects may have the following thematic lines:

[6] Resolución de la Secretaría General de Formación Profesional, por la que se convocan ayudas destinadas a la realización de proyectos de innovación e investigación aplicadas y transferencia del conocimiento en la Formación Profesional en el año 2023, en el marco del Plan de Recuperación, Transformación y Resiliencia - Financiado por la Unión Europea - NextGenerationEU.

[7] Resolución de la Secretaría General de Formación Profesional, por la que se convocan ayudas destinadas a la realización de proyectos de innovación e investigación aplicadas y transferencia del conocimiento en la Formación Profesional en el año 2023, en el marco del Plan de Recuperación, Transformación y Resiliencia - Financiado por la Unión Europea - NextGenerationEU.

*Line 1. Technological, environmental, production process or service provision innovation. Transfer of knowledge between companies or entities and vocational training centres and, through the exchange of innovative experiences or R+D+i, at national, regional or local level.*

*Line 2. Development of professional skills linked to digitalisation, such as those related to industry 4.0. or the development of 5G communication networks, and the circular economy, among others.*

*Line 3. Promotion of gender balance in women's access to vocational training profiles directly or indirectly related to STEAM vocational training qualifications and their professional insertion.*

*Line 4. Creation of structures for the promotion of entrepreneurial competence, linked to vocational training centres (incubators, business incubators, etc.), which stimulate entrepreneurial competence, and which facilitate the transition to the labour market from the training environment, providing the necessary framework, standards, support and accompaniment.*

*Line 5. Design and testing of challenges or training projects, which allow methodological innovation towards challenge-based learning, with special attention to the incorporation of transversal competences, including design-type of technical and structural adaptations of training spaces to new methodologies.*

*Line 6. Development of stable innovation ecosystems between the main agents of each professional sector, strengthening and guaranteeing collaboration, the excellence of the talent of their professionals and the transfer of knowledge between vocational training centres, companies and/or entities specialising in innovation in the same.*

As for the financial endowment of the 2023 call for grants, the maximum amount that can be requested per project will be €120,000[8].

The application for the call can be made through the following [link](#).

[8] [Resolución de la Secretaría General de Formación Profesional, por la que se convocan ayudas destinadas a la realización de proyectos de innovación e investigación aplicadas y transferencia del conocimiento en la Formación Profesional en el año 2023, en el marco del Plan de Recuperación, Transformación y Resiliencia - Financiado por la Unión Europea - NextGenerationEU.](#)





# CRITICALTHINKING4VET: A NETWORK THAT CAN HELP YOU

Criticalthinking4vet is a European network made up of prestigious technology companies and research centres that develop cutting-edge projects in a wide variety of fields (biohealth, smart materials, nanocomponents...), vocational training

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**thinking**  
**for**  
**VET**

centres and expert entities in innovative learning methodologies. Both sectors collaborate to create technical and labor training adapted not only to the needs of the technology sector but also to those of students with obstacles.

The Criticalthinking4vet network considers that VET students have a key role in the development of technological innovation projects, especially those young people with more obstacles who, despite this, demonstrate a capacity for self-improvement, dedication and learning that makes them overcome all their barriers. On the other hand, technology companies and research centers have the capacity to provide them with an experience that helps them access the labor market and develop fundamental competencies and skills for their social, professional, and personal future.

Among the main entities that are part of the Criticalthinking4vet network are:

- Technology companies and research centers.
- Vocational training educational centers.
- Entities expert in innovative learning methodologies.



## Technology companies and research centers

These are technology companies and research centres from Spain, Italy and Portugal that develop cutting-edge innovation projects in the technology sector with experience in hosting student and teacher mobility. Thanks to being members of the Criticalthinking4vet network, they have not only been able to strengthen ties with the Vocational Training education sector and realise the opportunity that Vocational Training and its students represent for their staff, but also participate in the creation of resources and tools that train their employees and promote the inclusion of VET students with obstacles in the technology sector.

# IKASIA TECHNOLOGIES

Ikasia Technologies is a technology company established in 2015 as a spin-off of the Universitat Politècnica de València and promoted by the Center for Biomaterials and Tissue Engineering. Ikasia develops new innovative technologies in different scientific fields, including 3D printing, additive manufacturing, composite materials and biomaterials.



[www.ikasia.es](http://www.ikasia.es)



[info@ikasia.es](mailto:info@ikasia.es)

The aim of Ikasia is to contribute to knowledge and collaborate with the social and technological development of our society, thus contributing to a better future. For this reason, it not only carries out a constant process of research and development, but, through the coordination and participation in projects of the Erasmus Plus Programme, it promotes the inclusion of people with fewer opportunities, especially VET students with obstacles.

In this sense, the entity has 3 main areas of work:

- **Development of educational projects.** Through educational projects in the field of vocational and adult training, it seeks to generate resources that promote critical and scientific analysis to promote inclusion and employability in vocational training students and adults with obstacles in the technology sector, as they consider that the technological field can provide them with an opportunity for employability and essential inclusion. Thus, in the last seven years he has coordinated and participated in seven projects of the Erasmus Plus Programme in collaboration with technology companies in Italy and Portugal and educational centers in France, Greece and Spain. On the other hand, it has hosted various long- and short-term mobilities of more than 20 VET students at its facilities.
- **3D printing.** Ikasia has a 3D laboratory in which it develops hybrid materials with plastic, glass or ceramic components using a 3D additive manufacturing process patented by the entity.
- **3D biotechnology.** We generate state-of-the-art additive manufacturing systems in the field of biomedicine for the development of disease models and tissue regeneration. To do this, we create innovative 3D equipment that allows the creation of personalized and biodegradable models for each patient. Our goal is to contribute to improving the quality of life through the creation of effective personalized treatments without adverse effects on the patient.

# SMALLCODES

Smallcodes is a software development company for scientific and educational projects. Its activity is framed in three main areas:



<http://smallcodes.com/index.php/en/home-eng/>



[info@smallcodes.com](mailto:info@smallcodes.com)

- **First area.** Promotion of linguistic diversity through technology, with the aim of creating a network between the linguistic and cultural minorities of Europe, in order to guarantee each language a systematic and constant presence in the written world and in the world of ICTs. SC intends to bridge the digital divide between majority cultures and languages and minority and regional cultures and languages. To achieve this goal, it produces software systems for lexicography, spell checking, and neology/terminology planning for lesser-used languages, as well as systems for toponymy cataloguing and bibliographic archiving. These five modules are, according to SC policy, the first step towards a modern use of the language.
- **Second area.** Participation in European projects for the dissemination of digital skills, for linguistic and social inclusion, and for the training of disadvantaged people. Their participation in recent projects has allowed them to create an online platform for distance education and training, dedicated in one case to volunteers in the field of social inclusion and to immigrants and refugees in EU countries, and in the second case, teachers of visually impaired students of various grades. SC also participates in educational projects and creation of materials such as: books, DVDs and e-books and also collaborates with the implementation of ICT resources for school education: educational applications, e-books, e-learning platforms, mobile video games, online courses, language portals, etc.
- **Third area.** Software development in the medical field. For several years, SC has been associated with the University of Florence, with which it designs and develops technological applications for the processing of clinical pharmacological data, pharmacovigilance and bioinformatics.



# SOMATICA, M&S

SOMATICA, MATERIALS & SOLUTIONS is a Portuguese technology-based company that is having a great impact on the technology sector thanks to an intense design and creation of electroactive and intelligent materials, adapted to the specific needs of its customers and capable of performing complex functions. It has the support of the Physics Center of the University of Minho, where constant and advanced research and development is carried out in the area of these materials.



<https://www.somatica.pt>



[geral@somatica.pt](mailto:geral@somatica.pt)

Somatica Materials & Solutions aims to achieve a level of excellence in the field of electroactive materials and solutions

To make this vision a reality, the company has the support of the Physics Center of the University of Minho where a constant and advanced R+D is carried out in the area of these materials.

Our mission is to understand the needs of the market in order to provide cost-effective solutions following the highest quality standards.

Only by working closely with our partners, collaborators and customers is it possible to fully understand the best ways to integrate our technology into the materials around us.



# W4A

WISE4AUTOMATION (W4A) is a technology-based company located in Braga (Portugal) that emerged as a spin-off of the Universidade do Minho. They develop and produce electronic circuits and software for industrial applications and IoT systems for signal acquisition and processing, where they have solutions developed for national and international customers.



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W4A is a dynamic, proactive and specialized company whose objective is to guarantee or exceed the satisfaction of the needs and expectations of its customers and partners, seeking the best quality/price ratio demanded by the market. They seek to develop products of technological innovation, with quality design and systems of reliability, robustness and durability. Likewise, one of the main objectives is the qualified training of their employees, as they consider that the knowledge, talent and experience of their employees are the key to the success of their company.

It has a team of expert engineers and production specialists specialized in the areas of sensor integration, software, communication technologies, manufacturing (PCB and mechanical parts) and safety devices.

# NANOPAINT

Nanopaint is a Portuguese technology-based company that emerged as a spinoff of the Universidade do Minho (Braga) with more than a decade of experience in the development of electroactive polymers, composites, nanoparticle synthesis and innovative functional inks for the printed electronics market (printed sensors, data acquisition electronics, analysis software...).



<https://nanopaint-tech.com>



[info@nanopaint-tech.com](mailto:info@nanopaint-tech.com)

This company aims to contribute to the evaluation of the Internet of Things (IoT), implementing new sensors printed on a wide variety of objects and devices, thus improving the quality of life of humanity.

The wide range of printed inks and sensors they develop can be applied in many industries, such as:

- Automotive: the knowledge and development of printed sensors allows Nanopaint to support automotive projects with the development of smart materials, in order to reinvent the manufacturing processes of human-machine interface and sensors in the structure and cabin of the car.
- Aeronautics and aerospace: Nanopaint's functional inks allow the production of custom sensors that will be printed directly onto the structure or components of the aircraft, with low weight and volume, as well as the absence of wires.
- Healthcare: The company's team of engineers provides appropriate technical support, helping to develop medical devices.
- Sports: The application of inks or sensors printed on sports clothing and devices allows the possibility of monitoring and quantifying different types of physical parameters, in an easy and flexible way.

## CF-UM-UP

The Centro de Física das Universidades do Minho e do Porto (CF-UM-UP) started in 2014 and comprises the Centro de Física da Universidade do Minho (CFUM) and the Centro de Física do Porto (CFP), two previously existing research units, recognized and evaluated by the FCT.



<https://www.cf-um-up.pt>



<https://www.cf-um-up.pt/index.php/about-us/contact-us>

The two Centers agreed to join forces and form a comprehensive research center in the broad area of Applied Physics. The partnership aims to build new strategies to harness the enormous potential of more than 80 PhD researchers who constitute CF-UM-UP, in order to conduct high-quality research, both fundamental and applied, in Physics and adjacent areas.

CFUM was founded in 1994, as a research unit with a multidisciplinary scientific profile, encompassing both theoretical research and modelling as well as research and experimental development. CFUM is strongly involved in interdisciplinary research and development activities. The team includes physicists, materials scientists, mathematicians, and specialists in optics and optometry.

CFP is a relatively small research center entirely dedicated to research in theoretical physics, in the broad area of Quantum Physics and High Energy and Condensed Matter Fields, exploring synergies between theorists from different fields.

The main objective of the CF-UM-UP as a whole is to conduct internationally competitive research in various areas of Physics, fundamental and applied, linked to other disciplines of natural sciences and engineering, with strong international links and relevant, as far as possible, at the local level. CF-UM-UP has a critical mass of highly qualified researchers and aims to maintain the balance between applied and fundamental research and to be the basis for advanced training in Physics and adjacent areas, in the north of Portugal.

# CENTRO DE BIOMATERIALES E INGENIERÍA TISULAR

The Centre for Biomaterials and Tissue Engineering (CBIT) was created in May 1999 to bring together the efforts of researchers from various departments of the Universitat Politècnica de València in the fields of biomedical sciences, biomaterials engineering and their translation into clinical application.



<https://cbit.webs.upv.es>



[cbiomat@upvnet.upv.es](mailto:cbiomat@upvnet.upv.es)

Research in his laboratories focuses on the engineering of the cell-material interface. They develop and manufacture new systems based on materials of biomedical interest, from hydrogel-based matrices and polymeric scaffolds to microparticles and recombinant protein fragments.

The goal is to develop materials with specific functional properties and understand their interactions with cells in vitro and in vivo, with the guiding principle that we can engineer the combined use of materials, cells, proteins and other molecules, and physical stimuli, to guide cell behavior and stem cell differentiation. They develop most of the systems towards future applications related to tissue engineering and regenerative medicine concepts and to the in vitro modeling of healthy and pathological tissues.

## Vocational training centers

These are vocational training centers in Greece, France and Spain with extensive experience in coordinating mobilities of VET students and teachers. Being members of the Criticalthinking4vet network has not only allowed them to strengthen ties with the technology sector and facilitate the mobilization of their students and teachers in European technology companies, but also to increase their internationalization.

On the other hand, thanks to their participation in the network's educational projects, they have created numerous resources and tools for the training of their teachers and students that have promoted their inclusion and employability in the technology sector.

Among the educational centers that are members of the network are:





# 1ST EPALGEMATIKO LYEKIO KATO ACHAIAS

1st Epagelmatiko Lykeio Kato Achaias has been active for more than 10 years in planning and implementing international projects for its students and educational staff. We have successfully implemented many types of projects under the LLP and Erasmus+ programmes.



<https://1epal-k-achaias.ach.sch.gr>



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We have successfully implemented many types of projects under the LLP and Erasmus+ programmes. We have implemented projects in Mobility (IVT-VETPRO), Partnerships, Innovation Transfer, Comenius and Etwinning. The school plays a key role in the local community, supporting other schools that intend to start international cooperation under the Erasmus+ programme.

The training they offer to their students is aimed at promoting technology and its applications in all professional fields. They believe that the future is intertwined with technological development. For this reason, they combine vocational training with technology, believing that it is the path to a successful career in the complex world in which we live.

The main objective is to meet the educational and professional needs of students, as well as to facilitate their employability and give them the opportunity to live a unique experience thanks to the realization of more than 300 student mobilities. The aim of the school's teachers is for students to acquire quality knowledge, experiences and skills that will allow them to break down the economic and social barriers they face.

During this long period they have sent more than 250 students and 25 teachers abroad.

# ERGASTIRIAKO KENTRO KASTORIA

Ergastiriako Kentro Kastorias is a VET education center founded in 1999 and located in Kastoria, a Greek city located on the outskirts of Western Macedonia.



<http://1sek-kastor.kas.sch.gr>



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kastor.kas.sch.gr

It has become an educational centre that currently welcomes hundreds of VET students, with the aim that its students can, after the completion of their studies, successfully practice their profession, achieving a smooth integration into society and helping the development of the Greek economy.

To achieve this, the centre has laboratories of various specialities of Intermediate Vocational Training (Computer Science, Health, Electricity, Agriculture, Economics and Applied Arts), in which VET students can receive comprehensive technical and practical laboratory training.

It should be noted that the laboratories cooperate with the Vocational Secondary Schools (EPAL), the General Lyceums (G.E.L.), the Gymnasiums, the Public Vocational Training Institutes (DIEK) and the Unified Special Professional Gymnasiums and the Unified Special Professional Halls of Residence. Vocational Schools (EN. EEGYL.) of its scope.

The center has a multidisciplinary team of teachers and administrators focused on the fight for the social and economic inclusion of its students through technical and practical training that facilitates their entry into the labor market.

# IES ENRIQUE TIERNO GALVÁN DE MONCADA

IES Enrique Tierno Galván de Moncada is part of the network of public schools managed by the Department of Education, Culture and Sport of the GVA.



<https://portal.edu.gva.es/iesmoncada/>



46018631@edu.gva.es

Currently, the IES is a type A school with 863 students enrolled and 85 teachers of different specialties. It has become a benchmark educational centre in the region of L'Horta Nord, with a talent project for students with a great capacity for learning, with the incorporation of basic German in the linguistic-humanistic baccalaureate modality and with a Singular Molecular Biology programme thanks to which the students of the CFGS Diagnostic Laboratory carry out different polymerase chain reaction tests.

Finally, in addition to all this wide educational offer, the IES has been programming and organizing different cultural days of high artistic level for the city of Moncada and its region for some decades. First of all, since the campaign began in 2001 under the name "L'IES DE PORTES CAP A FORA", chamber music concerts, sculpture and painting exhibitions, dance festivals, etc., all of them starring performers and artists, have been organized. internationally recognized. At present, they have acquired great relevance, achieving a great diffusion thanks to our award-winning newspaper "El Tierno", Golden Wolf Award 2013 for the best youth newspaper in Spain.

# GRETA DU VELAY

GRETA DU VELAY, located in a rural area in the south of the Auvergne-Rhône-Alpes region, is a public training organization that brings together 21 educational institutions such as VET education centers, adult education and secondary schools, all under the wing of the Ministry of Education.



<https://www.velay.greta.fr>



<https://www.velay.greta.fr/le-greta-du-velay/contact/>

GRETA DU VELAY is a member of the GRETA network, which covers the entire French territory, making it one of the leading training providers in France (191 Greta and 4350 training places).

Since 1992 he has been involved in several research projects in the European framework for education, training and vocational integration, and has developed various resources (print, online or interactive) that are still used by the professional community to improve social and professional integration. These projects have allowed Greta de Velay to work with partners from all over Europe and thus gain experience in different areas of training.

It employs 4 training advisors and 40 trainers, and offers around 300,000 hours of training per year (hosting between 2,000 and 2,500 trainees). The interests of this entity are multiple, among which the complementarity of know-how, the use of specific resources, training, and the response as close as possible to needs stand out.

Greta du Velay's activity is framed by two main objectives:

- Support small and medium-sized enterprises in their training processes: analysis of training needs, implementation of training programmes, evaluation and monitoring. To this end, they offer courses in various areas, responding to local needs such as hospitality, industry (automation tools, 3D, maintenance, etc.) and tertiary (management, languages, computer science, etc.).
- Support the social and professional inclusion of disadvantaged target groups, such as VET students at risk of exclusion, unemployed adults or immigrants. To this end, they carry out various activities such as the development of key competencies, transversal competencies, providing support to discover and orient themselves towards careers and jobs, etc.

# CIFP POLITÉCNICO DE CARTAGENA

An educational VET centre that has been providing vocational training since 1902. The current facility opened in 1989. It is located in Cartagena (Region of Murcia).



[http://  
politecnicocartagena.es/](http://politecnicocartagena.es/)



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It is equipped with modern facilities that are enjoyed by more than 1,400 students and 140 teachers, as well as the administration and services staff. It has assumed a social role, as well as an educational one, structuring local development projects and trying to provide employability and inclusion opportunities to its VET students at serious risk of exclusion.

This centre has the most advanced and widest educational offer in the Region of Murcia, with an extensive programme of training actions from the Regional Employment Service. The IES Politécnico de Cartagena has the Erasmus+ Charter, maintaining a continuous collaboration with social, cultural, academic and business institutions from all geographical areas.

The centre has experience in carrying out mobilities for Higher Level Training Cycle internships.

From 1995 to the present day, they have won a large number of prizes and awards in the field of education.

The main objective of the IES Polytechnic is innovation and excellence in the training of students, as well as promoting their employability thanks to agreements with more than 300 companies and an active and prestigious job bank in the different training sectors of the center.

It is a centre that has been committed, since its inception, to attention to diversity, the reduction of social disadvantages, social inclusion, health and environmental education and the implementation of applied innovation projects.



# CIFP HESPÉRIDES

The CIFP Hespérides is an integrated VET centre that offers training aimed at both obtaining qualifications and certificates of professionalism. It provides students with training that allows them to adapt to job changes that may occur throughout their lives, as well as educate people who respect the rules and the environment



[https://  
cifphesperides.es/2020/](https://cifphesperides.es/2020/)



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It was created in 1953 with the name of "Almirante Bastarreche", which has endorsed its extensive experience in the teaching of Vocational Training.

The Centre is located in the Santa Lucía neighbourhood of Cartagena (Murcia), with a great maritime fishing tradition. The Centre serves nearly 600 students of Intermediate Level Training Cycles, Higher Level Training Cycles and other modalities of Vocational Training for employment aimed at active and unemployed workers.

To carry out its work, the Centre has a team of 56 teachers, organised into 6 professional departments of the family, in addition to the Department of Business Relations and the Department of Information and Career Guidance.

The school's participation in the Erasmus+ programme shows a firm commitment to the international professional development of our students and a firm commitment to the quality of training and the promotion of employment opportunities.

The centre's collaborative projects with companies in Germany, France, Ireland, Italy, Malta, Norway, Poland and Portugal offer our students the possibility of carrying out their professional internships in foreign companies as part of their job training, or as recent graduates.

This educational centre aims to promote and facilitate the education of students at risk of exclusion, as well as to encourage the professional and personal development of these students through innovation in teaching.

# Entities with expertise in innovative learning methodologies

These entities are experts in the creation of innovative learning methodologies for the training of people with obstacles. Among these we find:

## REDTREE MAKING PROJECTS COOP. V.

RedTree Making Projects Coop.V. It is a social cooperative, active in the fields of education, training and the design of educational materials



[www.redtree.es](http://www.redtree.es)



[info@redtree.es](mailto:info@redtree.es)

In its almost 10 years of history, the entity has become a benchmark in the creation of innovative digital educational processes and methodologies in very diverse educational fields (secondary, primary, adults...), having created specific tools, methods and digital environments to promote inclusion. and the educational success of students with obstacles.

Redtree's projects and areas of expertise are cross-sectoral, working mainly in 4 education sectors: school education, vocational training, adult education and youth training through non-formal and informal education. This social cooperative has developed very diverse functions within these four educational sectors, from the design of educational projects at European level, through didactic materials and tools, the control and monitoring of the quality of projects, advisory and consultancy functions, etc.

Through these projects and materials, RedTree seeks to fight discrimination and social inequality, fostering the employability and inclusion of students with economic and social barriers.

The RedTree team believes that education should provide new perspectives and develop critical and caring analysis skills to gain new qualifications, increase the level of ability and employability, social inclusion, active citizenship and personal development.



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Luis Gómez Estrada, was born in Valencia in 1980, with a Bachelor's degree in Industrial Design by "Universidad Politécnica de Valencia", experienced in the research field at the "Instituto de Biomecánica de Valencia" (UPV). Actually is CEO of Ikasia technologies and has experience as head of the 3D department in an engineering services companies. He has a broad experience in European and international project's management and coordination.



## **José Luis Gómez Ribelles – Ikasia Technologies SL**

José Luis Gómez Ribelles is a full professor at the Universitat Politècnica de València, carrying out his research work at the Centre for Biomaterials and Tissue Engineering, CBIT, of that university. He is currently the principal investigator of one of the research units of the CIBER-BBN of the Instituto de Salud Carlos III. His current line of research focuses on the development of biomaterials for tissue engineering and regenerative medicine.



## **Laura Gómez Estrada – Ikasia Technologies SL**

Qualified as a VET Technician, Laura has been incorporated in Ikasia in 2018 in the scientific and educational project development team. Having exhibited organization and managing skills, has since been responsible for projects coordinated by Ikasia included in the Erasmus + Programme in the field of professional education. Laura is a easygoing, and hardworking person. Her diverse professional parkours led to the development of a broad range of skills, from organization to and interpersonal skills, which she transposes to her professional everyday life.



### **Luis Amaro Ribeiro Martins - Ikasia Technologies SL**

Luis Martins is a Phd student at the Universitat Politècnica de València. After graduating applied biology from the Universidad e do Minho took a master in Biophysics and Bionanosystems on the same university. Additionally, has pedagogic competences and advanced english from Cambridge University and competences aided design, 3D printing and basic programming. Luis has experience in tutoring, orienting students projects or laboratorial internships.



### **Raquel Navarro Cerveró - Redtree Making Projects**

Raquel Navarro Cerveró is a social worker, an equality agent and has a Master Degree in Labour Risk Prevention, and she have worked with the association movements in Valencia for more than 15 years. Through her professional and associative career, Raquel has fulfilled responsibilities that have allowed her to develop a broad experience as Social Worker and Projects Technician, creating and managing associative and social economy projects to promote equality and social justice.



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Jivago Nunes have a degree on Optoelectronics and Lasers, and a Master in Materials Engineering, and worked as a scientific researcher during 5 years. After that, he has been the CTO of the company Somatica, Materials and Solutions, Lda. for the last 10 years and, as an entrepreneur, he have created 5 companies during the last 7 years.



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Silvia Randaccio has a degree in European and Extra-European languages, with a thesis in computational linguistics for the Arabic language. She currently follows numerous projects for the development of linguistic software, teaching materials, e-learning platforms and digital archives, for minority languages but also for other product sectors. She also manages digital marketing, SEO and web graphics.

She has also undertaken several external collaborations as a consultant, teacher and project partner for various entities that have allowed her to learn about new realities and work sectors.



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He works as a teacher in secondary technical education with specialization in computers and design implementation circuits and also the design and development of algorithmic structures. Now days is the Headmaster in VET Secondary School. He has 2 Masters, Economics in Education and In School Managment.

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Dimitrios Fligos has studied IT in Athens University of Economics. He started his teaching career at 1st Epalgematiko Lykeio Kato Achaias in 2002. He teaches IT and technology. Since 2002 he has taken part in many national and EU projects. He is responsible to organise students and teachers mobilities as well for the projects documentation. He has worked a lot to integrate ECVET system in the mobilities. He is also responsible to organise training activities for foreign students in the area. He has a key role to apply the mobility charter for vet high quality standards in projects planning and implementation.



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