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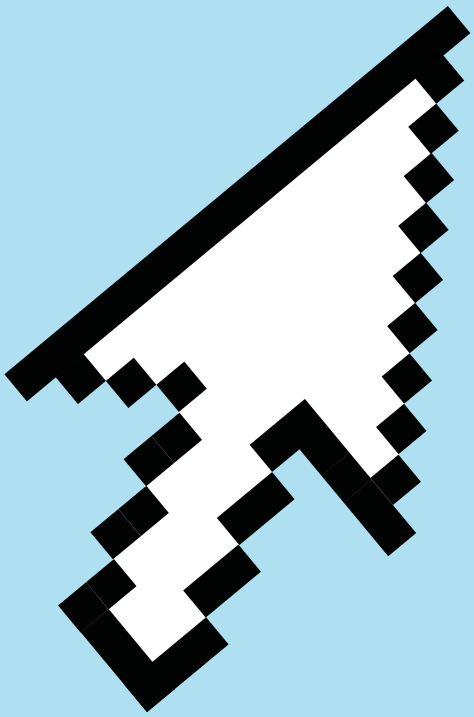

European Software Skills Alliance.

CASE STUDIES BOOKLET

12 Ideas to Tackle the Shortage of Software Professionals in Europe

Co-funded by the Erasmus+ Programme of the European Union

Title: Case Studies: 12 ideas to tackle the shortage of software professionals in Europe
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Table of Contents

About the European Software Skills Alliance

ESSA is a four-year transnational project funded under the Erasmus+ programme. It ensures the skills needs of the rapidly evolving software sector can be met — today and tomorrow.

It provides current and future software professionals, learning providers and organisations with software needs with the educational and training instruments they need to meet the demand for software skills in Europe.

ESSA will develop a European Software Skills Strategy and Vocational Education and Training programmes for Europe. It will address skills mismatches and shortages by analysing the sector in depth and delivering future-proof curricula and mobility solutions, tailored to the European software sector's reality and needs.

Foreword

Designing a strategy is both an exciting and challenging exercise. If it lacks practical relevance, it will bring no added value. Only if you bring practical and appropriate examples, your strategy can take a meaningful form.

ESSA's Software Skills Strategy for Europe is based on extensive research, where we looked at the market demand and supply in software skills. We asked ourselves a few questions like what are the wishes and expectations from the labour market? What does supply consist of? But above all: how can the supply better meet the market's expectations?

We also explored what is happening from the side of education and training — a field that develops pretty quickly with the aid of ICTs, bringing new learning modes and opportunities. Today, learning and working at a distance are part of our daily practice. But, not only technologies have the power to expand opportunities. They can also be brought forward by initiatives, visions of people and organisations. Our strategy has been inspired and fueled by some of them.

The booklet presents curated real-world good practice examples that help translate our strategy into concrete actions, and in turn, into the design of education and training programmes that will contribute to skill, upskill, or reskill individuals into high demand professional software roles.

The European Software Skills Alliance (ESSA) is a partnership between twenty-six organisations from universities to large ICT companies, to EU-wide business associations. The partners have provided one or more cases, based on their own experience, to illustrate our strategy.

We hope that these case studies can serve as further inspiration, not only for employers, educational institutions, and trainers but also for administrations, governments, and policymakers.

Thanks to all contributors.

essa.

Wanda Saabeel, Irish Computer Society
Nina Kocbek, Chamber of Commerce and Industry of Slovenia
ESSA WP2 Leaders

Learning game development at a distance with open-source tools

By: Hellenic Open University

Industry: Higher Education
Location: Patras, Greece
Size: +250 employees

Challenges:

>> “Ghost” teachers in distance learning courses
>> Limited flexibility of the higher education provision
>> Game software design high-level requirements

Solution:

The “Game Development Short Course” is a Greek high-level training course for programmers in the field of game design. The programme uses **open-source tools of the Python language family** (Python, PyGame, Blender, Panda3D, Unity, etc.) and is delivered fully online by the Hellenic Open University.

Over 32 weeks (550 hours), students are expected to deliver four mandatory **individual assignments** and one **group project-based assignment**. Learning is supported by **open-source educational material** and regular team-tutors online sessions.

All students are autonomous in their learning but are expected to follow a schedule detailed in a study guide. There are **weekly workload thresholds** to ensure learners are not overloaded and the drop-out rate is minimised. **The programme offers flexibility to learners but also mentoring and support when needed**. Online group consultation meetings take place regularly to solve issues faced by the learners, answer questions, and offer them a chance to present their progress and results.

The programme is designed so that students may learn to work both individually and in teams (in an asynchronous manner), **to develop both their hard (programming) skills and soft skills.** In total, there are 358 hours of individual distance learning, 176 hours of collaborative work, and 16 hours of group meetings.

Results:

In most cases, this short programme attracts **adult learners** who would like to upskill or reskill themselves into high-demand game software development role profiles.

The open, distance learning model proves to be effective to support large groups of learners. In this course, the Hellenic Open University supports up to **400 learners each year, divided into twenty groups** with a **1:16 teacher-student ratio** to ensure a qualitative experience for all.

Upon successful completion of the programme, learners receive **20 ECTS credits (EQF level 5) and an undergraduate certificate** issued by the University.

Key benefits:

- Teaches both hard (programming) skills and soft (management) skills
- Covers the entire game software development lifecycle, from inception to coding, to marketing the final product
- Can be taught fully online to large groups of learners with limited resources
- A working, open, distance learning model is easily transferable to other types of course
- Python can also be used for teaching key competences for Data Analysts, FinTech experts, and a plethora of other high-demand software role profiles

Key resources:

- Intensive project-based, distance learning courses require careful design and structured support from (experienced) trainers
- Educational content must effectively integrate a didactical approach and anticipate learners’ expectations
- A 1:30 teacher-student ratio to allow for a qualitative experience for all
- Curation of specialised educational content, ideally in local languages

An open education model for underserved students to be career-ready

By: IBM

Industry: ICT
Location: Armonk, USA
Size: +250 employees

Challenges:

>> Lack of opportunities for underserved communities to access tech education
>> Misalignments between traditional education offerings and market needs
>> Employers need to rely in the main on traditional four-year degree qualifications when hiring graduates

Solution:

P-TECH is a public education model, developed by IBM and educators. It provides high school and secondary school students from underserved communities with the **academic, technical, and professional skills and credentials** they need for competitive STEM jobs.

P–TECH schools are open and free for students. They are **partnerships between a second-level school, a third-level college or university, and industry partners** working together. The model combines **coursework with workplace experiences** like industry mentoring, worksite visits, traineeships and first–in–line for job considerations with a school's company partner.

Free, digital learning is also available through "SkillsBuild", which introduces students and educators to tech skills, from emerging technologies such as artificial intelligence, cloud computing, and cybersecurity, to new ways of working like agile and design thinking.

In Ireland, the P-TECH initiative has been adapted to the Irish Education system. The government launched the programme in 2018 which is implemented as part of the Dublin North East Inner City (NEIC) Initiative to oversee the long-term social and economic regeneration of the area. Piloting P-TECH Irish schools include Larkin Community College, Marino College, and St Joseph's CBS, Dublin partnering with the National College of Ireland, IBM, Cisco, Virgin Media, Irish Water, and Irish Life.

The independent **NEIC Programme Implementation Board** (PIB), composed of government departments and agencies, is tasked with the **delivery of key services and accountability for the expenditure of funds** related to NEIC project priority areas. Four **working subgroups**, each including community and business sector representatives, have been established in line with these priority areas and assigned relevant actions.

Results:

As of January 2021, there are **200 P-TECH schools across 11 US states and 28 countries.** IBM has provided **500 paid traineeships** to students (as of January 2020).

Graduates obtain both **second and third-level qualifications** (EQF level 5). To date, **339 students graduated** from the programme (started in 2011). Among them, **thirty-six were hired by schools' company partners** into full-time positions directly after graduating.

Key benefits:

- Strong commitment from students who are engaged by the curriculum, mentoring, and workplace experiences
- Graduates are immediately able to assume roles with the industry partners or continue their education

Key resources:

- A P-TECH coordinator (part-time) for both industry and school partners
- P-TECH "Blueprint" (curated guide of resources) to establish, implement, and advance the P-TECH model
- Upskilling training for second-level teachers to deliver the curriculum
- Collaboration between national education systems, IBM, schools, third-level institutions, and industry partners

Digital certificates for the recognition of non-formal education

By: HU University of Applied Sciences Utrecht

Industry: Higher Education
Location: Utrecht, Netherlands
Size: +250 employees

Challenges:

>> Digitisation and portability of the qualification and certification processes
>> Lifelong learning and certification

Solution:

The University of Applied Science Utrecht joined the national Dutch pilot programme on **Edubadges (digital certificates)** to experiment and award students and professionals who completed **extra-curricular achievements,** as part of their UAS Honours programme. The initiative answers a broader need to achieve lifelong learning with modular programmes and increased flexibility for learning pathways.

The pilot programme is implemented by a group of universities that also meets to share their experience and **addresses important technical, legal, privacy, and communication issues** related to the awarding of digital certificates.

The technical infrastructure used is supported by Surf — an IT cooperation organisation of educational and research institutions in the Netherlands. In practice, **teachers can now issue Edubadges in a few clicks for any student affiliated with the platform** so they can add it to their digital wallet.

Results:

380 learners have achieved 713 learning outcomes and **110 Edubadges have been awarded by 12 teachers** through the platform.

The results from this **Edubadges proof of concept** are used to develop **a pilot programme to issue Microcredentials**. While Edubadges are used to award non-formal education, Microcredentials will be used for formal education with the issuing of ECTS credits.

Key benefits:

- An easy-to-use platform to award Edubadges
- Simple digital recognition of knowledge that is portable
- Eases the identification of acquired skills and knowledge for students and potential employers — if recognised

Key resources:

- Involvement of legal, security, and IT departments of the university
- Teachers need to be trained on how to use the platform (0,5 hours)
- API connecting the Student Information System of the university and the platform to facilitate the issuing of badges
- Quality assurance processes and recognition of the Edubadges by third parties

Cultivating employees' skills and attracting young ICT talents

By: Zemanta (an Outbrain company)

Industry: Computer and information science
Location: Ljubljana, Slovenia
Size: <250 employees

Challenges:

>> Students and young professionals lack data science and machine learning related skills
>> Young talents are hard to attract
>> Keep employees' skillsets up to date

Solution:

Zemanta regularly updates the knowledge, competences, and skills of its employees. The **company supports the employees' career objectives** by offering challenging projects, working in a close-knit team, and fostering continuous professional development.

Actively sharing knowledge and experience is one of the key objectives of the company who also **sponsors a data science Masters programme** at the University of Ljubljana and organises the "Data Science Summer School" where its employees take part as lecturers and mentors.

Zemanta invites a selected group of **young professionals and students** to take part in the summer school. The **practice-oriented training** lasts for one week, during which participants get to experiment, learn, and brainstorm about how to apply data science and machine learning.

The programme is delivered by the company's expert data scientists and external lecturers which requires office work schedule adjustments to accommodate everyone. The participants are given **real-world problems** related to the company's challenges in the advertising technology industry and can socialise and build their soft skills at the social and networking activities.

At the end of the week, the company evaluates the overall satisfaction of participants and contributors and potentially creates new collaboration opportunities for the participating young talents.

Results:

Since its launch in 2018, the **Data Science Summer School** has attracted more than **90 applicants.**

Zemanta has trained **35 young professionals and students**, among which **two have joined their team** as full-time employees.

Key benefits:

- The short, focused programme offers participants real-world, concrete problems to solve
- Companies can detect young talents and hire them
- The programme can be replicated in an online format to get international participants or transfer knowledge to other companies
- A multi-disciplinary or cross-sectoral approach can be applied to define broader challenges

Key resources:

- Companies need to rearrange the work so their employees can take an active part in the programme
- A one-week programme implies limits to what real-world problems the company can propose and how accurately they can assess the participants' skillsets
- To run such a programme, companies must ensure that there is a large pool of interested potential applicants to balance out the relative organisational, logistical, and human resources costs induced

Training young NEETs for the most in-demand ICT job profiles

By: Adecco Formazione

Industry: Training and development
Location: Milan, Italy
Size: <250 employees

Challenges:

>> High rates of youth unemployment in southern Italy
>> Low number of ICT specialists
>> Need for companies to fill specific ICT professional vacancies

Solution:

The project **"Digital Evolution in the South"** is a **specialised training programme** funded by ANPAL under the National Operational Program "Youth Employment Initiative". It specifically **targets young NEETs** (Not Engaged in Education, Employment or Training) in southern Italy **to skill, upskill, or reskill them into high-demand professional ICT job profiles.**

The **blended programme** is based on a **theoretical part** (over 6 months) followed by a **practice-oriented part** (3-month traineeship). It is divided into three tracks — technical specialist, design & development, and development. **Each of them targets one or more ICT professional role profiles** that have been identified as critical and in high demand by project partner companies.

The technical specialist track relates to professional role profiles such as system architect, digital media specialist, ICT consultant; the design & development track targets web business analyst, technical specialists; the last track on development is channelled on the developer role profile — the most needed professional software roles of all[1]. Given the **training focuses on developing advanced skills** for the corresponding role profiles, there are some requirements, students must meet to enrol (i.e., basic knowledge of relevant topics).

The **partner companies** have a leading role in the successful delivery of the project. They **take part in the identification of the high demand roles and skills** and **host the beneficiaries** of the programme at their organisations so young people can fulfil the programme's work-based learning component. This win-win approach allows youngsters to practice and consolidate their new skills and enable **companies to attract and recruit new ICT talents.**

Results:

The programme aims at delivering **2,320 hours of specialised training** by twelve experienced trainers with the objective to train **110 young NEETs** and qualify them for high demand ICT specialist role profiles.

Key benefits:

- Teaches the required professional and technical skills to access high demand ICT job roles
- Beneficiaries perform a traineeship within partner organisations that need ICT specialists
- Directly addresses the social and work challenges of southern Italy. This can be replicated in other regions
- The project is part of the National Operational Program — which leverages the opportunity offered to the Member States under the European Social Fund's "Youth Guarantee Initiative" and is thus highly transferable to other eligible countries

Key resources:

- Coordinators of the project must identify and recruit relevant partner companies at the local level
- Companies need to be committed to sharing insights on the skills and professional roles they need and host trainees for 3 months
- A pool of coordinators (one per track) and specialised trainers is necessary to deliver quality training
System of the university and the platform to facilitate the issuing of badges
- Quality assurance processes and recognition of the Edubadges by third parties

1 ESSA consortium (2021), Results of "Europe's Most Needed Software Roles and Skills" needs analysis report https://www.softwareskills.eu/library/needs-analysis-report-2021/

A gamified, real-world approach to learning programming

By: Junior Olympiad in Informatics, High School XIV

Industry: Education
Location: Warsaw, Poland
Size: <10 employees

Challenges:

>> Engage young people in programming from an early age
>> Identify and train the future ICT talents and IT leaders

Solution:

The Olympic Computer Club (Olimpijskie Koło Informatyczne - OKI) invites **young polish people**, aged 9-19, to **learn programming, algorithmics and artificial intelligence** — regardless of their background, initial knowledge, or location.

Teachers from high schools and universities offer training activities free of charge to enable equal access to education. OKI students follow live, online classes and receive daily guidance and support. They can also take part in weekly physical **training for beginner, experienced, or advanced level** at the High School XIV.

During those online classes, students are taught and asked to s**olve concrete cases using a tailored-made system for programming competitions**, run by Warsaw University. Working on these cases, students can not only reinforce their knowledge but also boost their **soft skills** such as creativity and critical thinking skills while self-exploring, testing, and seeking solutions.

OKI also adds a **gamified and competitive element to the learning path** — the preparations for participation in the National "Olympiad in Informatics" where students can compete, propose solutions, and get rewarded for their outstanding achievements.

Results:

The **programming competition** "Olympiad in Informatics" is an excellent platform for students to apply their knowledge to real-world challenges offered by organisations and prove to be a good practice example for **engaging young people in programming**. National winners get the chance to compete in the International "Olympiad in Informatics" and, so far, have returned with medals.

The online, live classes hosted on YouTube gather about **500 students**, mostly from primary schools.

Key benefits:

- The gamified learning programme is attractive for young people
- Young pupils can develop both hard and soft skills that are essentials for pursuing a career in tech
- Encourages the mobility of young people at the local, national, and European levels

Key resources:

- A system that runs and tests students' programmes and computer applications for competitions
- Availability of the teaching staff at high schools and universities

Revamping traditional ICT education with an agile SCRUM-based methodology

By: HU University of Applied Sciences Utrecht

Industry: Higher Education
Location: Utrecht, Netherlands
Size: +250 employees

Challenges:

>> Education and training programmes are distant from the market needs
>> Education and training programmes can be too rigid for learners
>> High drop-out rates during the first year at university

Solution:

The **University of Applied Sciences Utrecht** (HU) is revamping ICT education with its **"**Open-ICT**" bachelor programme**. No standard courses and no exams on the menu but self-discovery and cultivation of a passion for ICT-related professions.

To propose such a shift from traditional learning paths, HU built on successful previous experiences of its programme's specialised branch on Open Innovation and introduced **agile learning and working processes based on the SCRUM methodology**.

Students are given **real-life assignments** and, after six months, **work on real-world challenges offered by external clients**. To complete their assignments, students meet every two weeks — as a team — to define the solutions they will build for their clients (sprint). Based on their functional wishes, students assign themselves tasks and identify what they need to learn next to complete the tasks.

Each student has a coach and receives continuous feedback on their professional and content-related development from peers and experts. Their **progress is tracked via a dashboard** based on ten essential ICT-related skills and helps them visualise where they stand as well as acts as a basis for the assessment.

At the end of an education cycle, students assess themselves and set their own development goals for the following period. The developments are discussed and polished during an interview with their coach.

Results:

The agile programme is effective to **lower the drop-out rate** during the first year (25%) at the university. Coaches have noted a very **high level of commitment** from students (>35 working hours/week) and overall **high satisfaction** (9/10).

Often, e**xternal clients have taken the products developed by the students into production**.

The programme has won the **university's educational innovation award** and a **national innovation award**. The related gains have been re-injected into the programme to cover for increased staff and innovation capacity.

Key benefits:

- Flexible, personalised learning pathways widen the access to education and improve learners' satisfaction
- Real-world assignments ensure education is linked to market needs
- Task-based learning makes it simple for students to identify their next learning step and continue learning independently
- Teachers can focus on coaching students rather than grading student work

Key resources:

- Support teachers to move from the "expert" to "coach" role
- Remodel classrooms into an open learning space fit for the student's needs, including 1-1 or team meetings, pitching areas, etc
- Agile programmes are well suited to markets where tech plays a major role and changes are rapid. It can be challenging to apply to other fields

Glocalising high-quality, scalable training activities in tech

By: NVIDIA Deep Learning Institute

Industry: Artificial intelligence
Location: Santa Clara, USA
Size: +250 employees

Challenges:

>> Organising high-quality, scalable training activities at the local level on artificial intelligence and related topics
>> Scarcity of and challenge to get up-to-date teaching material in the field of artificial intelligence

Solution:

The **NVIDIA Deep Learning Institute** (DLI) collaborates with universities and research laboratories to **train professionals, educators, and students in artificial intelligence, accelerated computing, accelerated data science**, and other hot topics. To this end, NVIDIA supports two complementary educator programmes — the "Teaching Kits" and "University Ambassador Program".

Teaching Kits, developed in collaboration with academic partners, are available to qualified **university educators** who **can integrate** at their convenience the lecture materials, hands-on exercises, GPU cloud resources, etc., **into curricula**. These educators are also eligible to get the "**instructor certification**" via the DLI **Ambassador Program**. This certification enables them to deliver free "instructor-led workshops" to their university staff, students, and peers.

To be certified, i**nstructor candidates must complete rigorous, course-specific evaluations**, run by a DLI Master Instructor, covering technical qualifications, subject matter expertise, knowledge of the teaching kits, classroom delivery skills, and the use of the DLI platform. Once certified, **instructors update their knowledge through continuing education** and the annual renewal of the University Ambassador membership. Certified instructors oversee the organisation of the workshops, including logistics, marketing, and delivery, but do receive financial support from NVIDIA to cover some of the expenses of the training activity.

Results:

This **private-public partnership** proves to be successful **to update the knowledge of large numbers of people in highly specialised and technological fields of science**.
The Ambassador Program and financial support allow for rapid, local uptake of the knowledge and Training Kits and support the universities' reskilling and upskilling efforts.

Instructor-led workshops can be scaled up by involving "teaching assistants" (with a **1:20 assistant-learner ratio**) allowing up to **120 people or more to be trained at once**. Upon successful completion, workshop participants receive an NVIDIA DLI certificate of competency.

Key benefits:

- The more ambassadors, the more people trained (snowball effect)
- Online courses and Training Kits maintenance costs are low
- Excellence programme that attracts instructor candidates
- Financial support to the universities' certified instructors

Key resources:

- University educators must go through a rigorous evaluation to be certified and able to deliver workshops
- Experienced researchers and educators are busy with their academic duties can propose and how accurately they can assess the participants' skillsets

Efficient corporate training with serious games

By: Pegneon

Industry: IT/Human Resources
Location: Athens, Greece
Size: +250 employees

Challenges:

>> Training a wide and diverse group of learners
>> Employees' and companies' lack of time for training

Solution:

Pegneon develops and delivers s**erious games for corporate training** like the "safety game" where learners explore an office area and act on hazards they may encounter at work or "factory", designed to educate industrial zone workers about safety measures.

Serious games have the potential to **engage the learners/players with an immersive, personalised, and active journey** which facilitates the learning process. The same game can be given to a **diverse group of learners** and does not require the involvement of a trainer, making it **cost-efficient for companies**. Pegneon also adapts its offer to the needs of companies, developing custom made serious games.

It takes about **20-30 minutes to complete a learning objective.** This parameter is important for learner professionals and companies who often lack time for training[1].

A summary of the player performance is provided to learners, indicating the areas of improvement.

Results:

Pegneon's clients, like Netlink or the Eleftherios Venizelos Airport, have reported that **all learners have completed their learning objectives successfully**. These results seem to indicate **serious gaming increases the learners' completion and engagement rates**.

Key benefits:

- A flexible, tailored approach to training employees
- Action-based approach engages the learners and offers better completion rate than other types of e-training
- Cost and time effective training for companies and employees
- Replicable and adaptable to different learning materials

Key resources:

- Knowledge of game design and good UI/UX
- Clear definition of the learning objectives and in-game parallelism
- Basic knowledge of gaming mechanics for learners

1 ESSA consortium (2021), Results of "Europe's Most Needed Software Roles and Skills" needs analysis report https://www.softwareskills.eu/library/needs-analysis-report-2021/

Training companies' staff in software skills

By: University of Ljubljana

Industry: Higher Education
Location: Ljubljana, Slovenia
Size: <250 employees

Challenges:

>> Upskilling personnel in software skills
>> Skilling students in software skills
>> Shortages of software professionals in Slovenia

Solution:

The Faculty of Computer and Information Science at the University of Ljubljana runs the FRI Academy (Akademija FRI), offering **extra-curricular courses to train individuals, companies, or high schools in software skills**.

The university appointed a coordinator, who oversees the organisation of the yearly programme of the courses, looks for interested academic lecturers and external collaborators and assumes the logistical and marketing responsibilities. The **programme is led and delivered by the professors and researchers of the faculty,** allowing the **transfer of the latest research results and knowledge**, and ensuring quality content.

The FRI Academy offers a wide range of training courses from data mining to big data management, to artificial intelligence and deep learning. **Training activities are flexible and adapted to the audience**, upon request from companies or high schools. They can take the form of lectures, technical training with a demo project, or first-hand intensive training — from basic to highly specialised levels.

The training courses are delivered on-site on the faculty's premises and are limited to ten to fifteen participants depending on the type of activity to allow for higher levels of engagement with the participants and direct feedback.

Results:

Six tailored courses have been organised **for companies** but there is no one-fit-all solution. Results have shown that even if the courses are tailored to the needs of a specific company, it can only be done up to a certain degree and specific individual skills gaps remain. **Companies should segment their needs further for more efficient training results.**

Key benefits:

- Flexible training courses, tailored to the audience needs
- Direct transfer of knowledge from the latest research results
- Leverages the knowledge and expertise of academic staff to upskill and reskill companies' personnel
- Companies can get public co-financing from the Slovenian Enterprise Fund to cover the training costs. In Slovenia, this is managed by the Digital Innovation Hub of Slovenia

Key resources:

- Availability of the academic staff, level of expertise and depth of knowledge in specific topics, depending on the company's needs
- Visibility towards potential clients, i.e., companies and high schools

Profession-relevant soft skills training for ICT professionals

By: ITS Antonio Cuccovillo

Industry: Non-academic professional training
Location: Bari, Italy
Size: <50 employees

Challenges:

>> Equip ICT professionals with soft skills

Solution:

ITS A. Cuccovillo is a training institute (EQF level 5) specialised in mechatronics. The foundation's training offering includes specific modules related to soft skills including team working, communication, problem-solving, project management, and entrepreneurship — essential non-technical skills sought after by companies for software professional roles.

These modules are 10-20 hours long and built based on the results of labour market research defining the required soft skills. The courses are, for the most part, practical activities that are based on the experiences of students (some of whom have work experience) and on real-life cases. Small classes of 20-25 students give every learner a chance to actively participate.

This modular experience and research-based way of working and learning enable students to benefit from tailored training and allow teachers flexibility in the delivery of the course — making the relational dimension key to success.

Results:

With these courses, students get an understanding of the relevance of soft skills in ICT-related professions and can build their skillsets accordingly. Their employability potential is therefore boosted.

Key benefits:

- Soft skills capacity building for ICT professionals
- Formal learning of soft skills, integration into professional subjects

Key resources:

- A well-oiled evaluation mechanism to assess soft skills and competences rather than knowledge
- A clear link to the profession-related goals of students

Bringing knowledge of market players into education

By: ICT Association of Hungary

Industry: ICT
Location: Budapest, Hungary
Size: <50 employees

Challenges:

>> Graduates lack practical technological and business-related knowledge and competencies
>> Shortages of university lecturers and/or appropriate institutional knowledge on recent technologies

Solution:

Hungary's **"Code your future!" project** (GINOP-3.1.1-VEKOP-15-2016-00001) is a large-scale initiative, supported by the European Social Funds, that tackles the shortages of ICT specialists. The project is about significantly **growing the number of ICT career-ready graduates** and bringing **knowledge from market players into education.**

Partner of the national project, the **ICT Association of Hungary** was tasked to develop and manage the concept and service of **a "trainers' pool"** that extends or establishes **cooperation between academic partners and ICT companies** and most importantly, involves market professionals in **practical training activities** at the participating universities. For operations, an intermediary company takes charge of the implementation of the "trainers' pool" and service provision via public procurement.

The "trainers' pool" is a **virtual database of market professionals** who previously collaborated with participating universities of this initiative. The matchmaking between universities and trainers also happens via the intermediary company which coordinates with both parties and ensures service provision.

In practice, this means **universities define their semestrial plan, needs, and include their wishes for specific trainers.** They submit them to the intermediary company, tasked to hire the trainers identified by the university or by the intermediary company in the "trainers' pool" or in its own network.

To be eligible, universities must send their plans before the start of the semester, allowing enough time to **find, negotiate, and plan the course with the trainer.** Based on the universities' requests, trainers define an outline of the lecture. The latter is **evaluated by a board** of two IT specialists and one market expert responsible for quality assurance, notably ensuring the relevance of lectures to the labour market expectations.

Upon acceptance and after the delivery of the training, the intermediary company remunerates trainers.

Results:

Over four years of the project, **2906 guest lectures** were given and **101 courses delivered** by market professionals.

Each year, there are about **50 market professionals** involved in the lecturing activities.

Key benefits:

- Strong relationship between academic and company partners
- Future-ready workforce, with the IT competences sought after by companies
- Replicable and adaptable to different Member States, using the European Social Funds

Key resources:

- Experts and IT specialists to conduct the quality assurance
- Coordinating organisation (intermediary company) and administrative support to ensure seamless matchmaking
- Competitive financial compensation for company partners/trainers
- Availability of funding

Achieving high quality, hands-on professional training for IT students

By: ICT Association of Hungary

Industry: ICT
Location: Budapest, Hungary
Size: <50 employees

Challenges:

>> Universities' high drop-out rates among IT students
>> Attractivity of market entry job offers leading to discontinuity of studies
>> Universities' lack of institutional knowledge on the latest/most sought after technologies
>> Companies' senior employees have limited mentoring skills

Solution:

The **ICT Association of Hungary** is part of the national project **"Code your future!"** (GINOP-3.1.1-VEKOP-15-2016-00001), supported by the European Social Funds. The association was tasked to conceptualise and design **an internship programme (and service) for IT students**, based on desk research findings and in-depth analysis of ICT companies' needs and internship practices.

Internship programmes are not new, but the ICT Association of Hungary brought on the table innovative elements that facilitate the **talent selection and hiring of interns** for companies and ensure that **students can receive high quality, hands-on professional training.**

Instead of working with employment agencies, they turned to **student career counselling centres (SCCC)** who have direct means of communication with the potential interns and apply advantageous tax solutions for companies to hire them. The **internships are paid by the project** and covers about three months of internship at the selected companies which removes companies' roadblocks and offers financial stability to the working students.

With this programme, a student can benefit from a maximum of **500 hours of internship at one or up to three companies.** Companies can hire interns for **20h/week when classes are held**, but this can go up to 4**0h/week during any other period** — a model that protects the quality of the students' learning experiences and increases its practical relevance.

The programme is run operationally by a SCCC, operating via public procurement. Internship positions are curated, students' skills pre-assessed for optimal matchmaking, and positions filled. The programme also includes the **"development of mentors' competences" — a 16-hour training for company mentors** to build their capacity on relevant aspects like task delegation, internship programme building, monitoring and evaluation.

Results:

The internship programme strengthens cooperation between universities and ICT companies. It results in lower drop-out rates and immediately services the labour market with a capable workforce. Over two years, **230 ICT companies** benefitted from it and **760 IT students found a paid internship** opportunity.

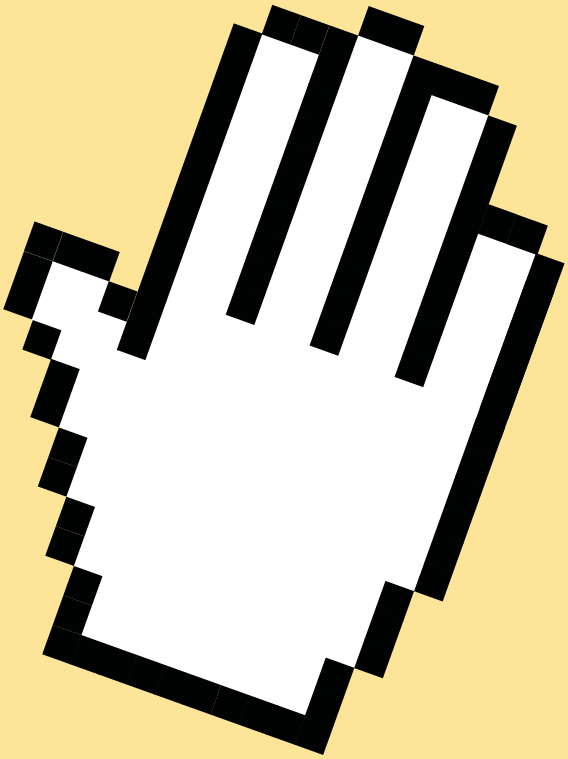
Results from the second year of the programme show that out of the 260 students serviced this year, **150 of them have received longer-term, part-time offers from companies** under favourable conditions which allow them to continue and finalise their studies.

Key benefits:

- Real-world, hands-on experience for IT students that doesn't jeopardise their university learning experience
- Companies can easily hire interns at (almost) no cost
- Better retention rates at universities
- Replicable and adaptable to different Member States, using the European Social Funds or national funds

Key resources:

- Mentors' time and availability
- Availability of funding



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