



CLEARING THE PATH TO THE DIGITAL DECADE

Outcome report of high-level workshop: A coordinated approach towards developing advanced digital talent

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Authors:

Lead Author (Org)	Tanya Suárez (BluSpecs)
Contributing Author(s) (Org)	Cristian Salis, Maximilian Welford (BluSpecs)

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Abbreviations

<i>ADS</i>	Advanced Digital Skills
<i>ADT</i>	Advanced Digital Technology
<i>AI</i>	Artificial Intelligence
<i>AMS</i>	Austrian Public Employment Service
<i>CSA</i>	Coordination and Support Action
<i>CODDII</i>	Conference of Directors and Deans of Computer Engineering Spain
<i>DAI</i>	Danish Accreditation Institute
<i>DG</i>	Directorate General
<i>DG-CNECT</i>	Directorate General for Communications Networks, Content and Technology
<i>DG-EAC</i>	Directorate General for Education, Youth, Sport and Culture
<i>DG-EMPL</i>	Directorate General for Employment, Social Affairs and Inclusion
<i>DigComp AT</i>	Digital Competence Framework Austria
<i>DIGITAL</i>	Digital Europe Programme
<i>Digital Decade</i>	Digital Decade Strategy
<i>DSJP</i>	Digital Skills and Jobs Platform
<i>DSP</i>	Digital Skills Profile
<i>EC</i>	European Commission
<i>EU</i>	European Union
<i>HaDEA</i>	European Health and Digital Executive Agency
<i>HEI</i>	Higher Education Institute
<i>HLPW</i>	High-Level Policy Workshop
<i>ICT</i>	Information and Communication Technologies
<i>IoT</i>	Internet of Things
<i>LEADS</i>	Leading Europe's Advanced Digital Skills
<i>VET</i>	Vocational Education Training
<i>SMEs</i>	Small and Medium Enterprises
<i>SO</i>	Strategic Objective of the Digital Europe Programme
<i>STEM</i>	Science, Technology, Engineering and Mathematics



1 INTRODUCTION

The Digital Europe Programme (DIGITAL) (2021-2027) is an EU funding programme focused on bringing digital technology to businesses, citizens and public administrations. With an overall budget of over €7.9 billion, DIGITAL aims to shape the digital transformation of Europe's society and economy. The programme also has five interrelated Specific Objectives (SOs):

- SO1 – High Performance Computing
- SO2 – Artificial Intelligence
- SO3 – Cybersecurity and Trust
- SO4 – Advanced Digital Skills
- SO5 – Deployment & Best Use of Digital Capacity & Interoperability

Leading Europe's Advanced Digital Skills (LEADS) contributes towards SO4 and plays a strategic role in reaching the ambitious goal of creating 20M new ICT specialists by 2030. Since its commencement in October 2022, LEADS has performed in-depth analyses of the demand and supply of Advanced Digital Skills (ADS) and mapped out the current offering of relevant study programmes in Europe. Moreover, LEADS has coordinated a portfolio of 38 projects funded under the DIGITAL programme.

Over this period and through these activities, several challenges that hinder the development of innovative, flexible, and industry-aligned educational programmes have been identified. In general, educational programmes struggle to keep up with the rate of change of advanced technologies, but industry players' needs for skilled labour surge as they implement digital transformation strategies. Stakeholders emphasise the need for tailored approaches from training providers, yet Higher Education Institutions (HEIs) and Vocational Education Training (VET) providers lack the necessary flexibility to deliver.

To this end, LEADS organised a High-Level Policy Workshop (HLPW) convening 52 high-ranking attendees from 18 countries, to engage in insightful discussions on the internal and external factors limiting the supply of ADS and provide actionable recommendations to the problem at hand. The topics addressed in the HLPW include:

- The roles of HEIs and VETs, and opportunities for collaboration between the two.
- Novel approaches for supporting the scalable development of ADS across the EU.
- Successful case studies of training, upskilling and reskilling labour through innovative study programmes and relevant initiatives.

1.1 Purpose and target audience of the report

This report summarises the main points that emerged in the discussions at the HLPW, as well as key recommendations extracted from the conversations. It aims to provide preliminary answers to pressing questions at the intersection of HEIs, VETs and industry:

- What is the role of HEIs and VETs in creating the appropriate skills and profiles?
- What does it take to bridge the ADS gap?
- With the fast changes in what ADS are requested by industry, how can training providers adapt rapidly enough to match this?

As such, the report is intended for use by a broad range of stakeholders, including but not limited to:

- HEIs and VET providers
- European policymakers
- Industry players (ICT and non-ICT companies and SMEs)
- Other stakeholders that are active in the field of ADS

2 ADVANCED DIGITAL SKILLS IN CONTEXT

2.1 Specific nature and challenges

In the past years, the European industry and labour market have been facing major external challenges. Some of the most important threats to European prosperity and competitiveness, however, appear to arise from internal factors. In fact, a central concern across the three Directorates-General (DG) represented in the High-Level Policy Workshop (HLPW), i.e. DG for Communications Networks, Content and Technology (DG-CNECT), DG for Employment, Social Affairs and Inclusion (DG-EMPL), and DG for Education, Youth, Sport and Culture (DG-EAC) is the availability of Advanced Digital Skills (ADS) in the European talent pool.

Specifically, the LEADS data shows that across 42 highly requested occupations, including software developers and application programmers, European firms already experience severe skills shortages. That said, the problem extends beyond principally Information Communication Technology (ICT) oriented fields and is present across industries as diverse, as healthcare, manufacturing and energy. It is estimated that one third of the total EU workforce lack basic digital skills, and even among young people, 34% of school students are underachieving in terms of ADS.

Having recognised the pressing need for digitalisation and addressing existing ADS shortages across Member States, the European Commission (EC) has established various programmes, including the Digital Europe programme (DIGITAL) and Digital Decade Strategy (Digital Decade), which, among their wider objectives, aim to improve the availability and level of ADS in Europe.

A key goal of the DIGITAL programme is to contribute to bridging the forecast 12 million ICT specialists' gap in the Digital Decade targets for 2030, while promoting the participation of women in STEM and digital. In this context, c.€85M was invested in the first calls for educational programmes that promote structural and sustainable partnerships between academia, research entities and industry players (SPECIALISED Masters). The aim is not only to increase the offering of such programmes, but also to ensure that the programme supply addresses concrete needs of the European market, particularly in ADS.

In this sense, the discussions held within the HLPW underscored the need for intensifying existing efforts and promoting further investments in ADS, through the lens of specific case studies presented by key ecosystem players.

2.2 Scope of relevant profiles

Understanding the scale of impact that digital technologies have in European industry and society is an essential to identifying the profiles affected by the rising demand for ADS. Overall, 90 million people, a significant segment of the European workforce, will need to be reskilled and/or upskilled by 2035 to meet the digital economy's demands. It is, therefore, clear that the impact of digitalisation will not be limited to specific professional roles but will affect workers across different functions and sectors.

With this in mind, core themes in the discussion of ADS include:

- **Science, Technology, Engineering & Mathematics (STEM) graduates:** They constitute ideal candidates for upskilling and reskilling to meet the ADS demands in Europe, particularly when they work closely with domain experts.
- **Domain experts:** The integration and interrelation of technology across all verticals and sectors of the European economy strengthens the need for ADS in non-ICT professionals. The industry workshops held throughout LEADS found that training domain experts in ICT provides better returns, more quickly than equipping ICT specialists with domain knowledge.
- **ICT specialists:** Given the rate of technological development, ICT specialists must keep their skills current. For example, the introduction of 5G has widely altered the job descriptions of networking engineers. Fostering a growth mindset and lifelong learning can greatly influence ADS in European talent.
- **Women:** Girls and women are specifically addressed in Specific Objective 4 (SO4) of the DIGITAL programme, as they currently represent 18% of the ICT workforce in Europe.¹ Attracting girls and women into ICT and STEM and supporting their transition to digital careers will significantly broaden the existing talent pool of digitally trained professionals.

2.3 Current roles of HEIs and VET providers

Higher Education Institutions (HEIs) and Vocational Education Training (VET) providers both have central roles to play in promoting ADS and supporting the industry to meet the increasing demand for digital competencies.

Although HEIs have traditionally been the main provider of skills in Europe, major reforms are required to boost their efficiency in equipping students with ADS and maximising their impact not only in academia, but also in European industry. Despite their extensive infrastructure and networks, HEIs tend to have limited resourcing and fully timetabled staff. As such, the development of novel courses, approaches or even partnerships with regard to ADS needs to take place along their existing workload, which is a significant obstacle to new course development.

European universities face several obstacles to introducing a more agile approach to ADS course content. Firstly, current courses follow a business model that exploits the investment in developing content for delivery over a 2–3-year period. Secondly, the administrative burden associated to accreditation processes across Europe is lengthy and cumbersome with the goal of ensuring the quality of offerings and graduates, but which is too long for the fast-evolving demands. Additionally, it is being observed that expertise in frontier technologies is more likely to be found outside of academia.

VET providers are able to act with greater flexibility, which opens up opportunities to create more flexible pathways in education. Endorsing mobility between study programmes, encouraging students to switch from higher education to vocational training or vice versa, as well as from industry to HEIs and VETs, could improve the match between the supply and

¹ <https://www.eppgroup.eu/what-we-do/with-eu-countries/ireland/europe-needs-more-women-in-stem>

demand for specific ADS profiles. On the other hand, VET has traditionally provided practitioner focused training and apprenticeships that are more relevant to 'steady' state skills, certifications and curricula.

2.4 Key policy instruments and initiatives

Participating in the HLPW discussions, the DG representatives showcased a range of policy instruments and initiatives that have been put in place to address the ADS shortage in the EU:

- **Cybersecurity skills academy:** It is intended to act as an umbrella initiative that will bring together all relevant projects funded under the DIGITAL programme and maximise the impacts of the ongoing efforts. Security is a top priority for the European Commission and this initiative is expected to influence future funding, not only in cybersecurity, but as a transversal skill required across all digital profiles.
- **Action plan on labour and skill shortages:** Published on 20 March 2024, it includes activities centred on 5 policy areas² and is expected to activate underrepresented groups in the labour market, enhance internal mobility, attract talent from abroad, thereby increasing the supply of ADS talent through training, upskilling, reskilling and importing.
- **European Social Fund (ESF):** As the largest mechanism to invest in human capital, the ESF allocates approximately one third of its available budget to skills, a significant part of which is received by VET providers. The fund's strategy has been updated to take into account new technological developments and the associated digital skills.
- **European strategy for universities:** Although it does not specifically focus on ADS, the European strategy for universities supports HEIs in staying relevant and competitive among the ongoing changes in the labour market. ADS have a central role in enabling this objective.

² (1) Supporting the activation of underrepresented people in the labour market

(2) Providing support for skills development, training and education

(3) Improving working conditions in certain sectors

(4) Improving fair intra-EU mobility for workers and learners

(5) Attracting talent from outside the EU

3 DISCUSSION OUTCOMES

3.1 Topic 1: Role and impact of accreditation

Presented by David Metz, Senior Advisor of the Danish Accreditation Institution (DAI), the case study on rapid accreditation within HEI provided a fundamental overview of the accreditation process and the responsive policy approaches adopted by Denmark.

The DAI handles accreditation requests by various types of organisations beyond HEIs and VET providers, including university colleges, business academies, as well as maritime and art institutions. These entities provide different formats and levels of education and are regulated by relevant laws and ministerial orders according to their nature. The plethora of training providers has driven the DAI to trial an agile approach to accreditation.

Institutional accreditation

Since 2013 the DAI has been providing institutional rather than programme-specific accreditation, which provides HEIs with a partial self-accrediting right and enables them to conduct minor changes in existing programmes without the need for external approval. Institutional accreditation is valid for 6 years, after which a revision must be performed. This approach reduces necessary documentation on behalf of the HEIs by 93-95%.

Institutional accreditation in Denmark is performed in two rounds and typically takes around 12 months – on the contrary, programme specific accreditation used to last between 6 to 8 months for each programme. The results of institutional accreditation can be:

- **Unconditional accreditation**
- **Conditional accreditation:** in which case the institution's progress against determined criteria is monitored over a period of 2 years.
- **Refusal of accreditation:** in which case the institution needs to recommence the application process.

The efficiency of the process is reflected in numbers, as approximately 50% of applicants receive unconditional accreditation, 40% receive conditional accreditation, and only 10% are unsuccessful in the first round. In the second round, approximately 90% of the candidates manage to secure accreditation

Programme prequalification

This type of accreditation only applies to study programmes that are new and/or are set to be offered in a new location. Prequalification of new programmes takes only 10 weeks and is granted on the basis of compliance of study programmes with specific European standards and guidelines, coherency with the national HE ecosystem, as well as their relevance for the Danish society and markets.

“You also need to consider when [a programme] is actually new. How many elements do you need to change? Is it when you change books, the curriculum?”

David Metz, Senior Advisor, Danish Accreditation Institution

The application for prequalification involves the submission of documentation of maximum 30 pages, which includes an outline of the intended learning outcomes and structure of the study programme, and an analysis of the societal demand for it.

3.2 Topic 2: The role of HEIs in ADS development

HEIs provide their learners with the necessary knowledge and competencies to thrive in the emerging digital economy. However, it is widely accepted that the increasing demand for ADS indicates a need to reconsider the current purpose of educational institutions. Our HLPW participants envisioned the roles of HEIs provider to evolve as:

Explorers of novel programmes, courses and approaches

Higher education institutions need a space to experiment with new methods for imparting skills. Allocating a dedicated budget for research and development can help these institutions meet the growing demand for advanced digital skills (ADS) without undermining their primary objectives. This targeted investment in innovation will allow them to explore new opportunities and improve their educational programs while staying true to their core mission.

“What we all need is that kind of playground, that safety net, that allows us to see what we can achieve without compromising the core business of the universities”

Dave Flynn, Director of Business Networks, Skillnet Ireland

For example, microcredentials are seen as an enabler for quick development and certification of new specialised courses, which could soon emerge as major qualifications along with traditional degrees. HEIs providers should explore this option and work closely with companies and SMEs to design materials that cater directly to the market’s needs and appeal to both students and established professionals.

Collaboration space integrators

Dave Flynn introduced Skillnet Ireland, the national talent development agency and facilitator of cooperation between academia and industry in the country, as an example of a business model that should be adopted to address the growing ADS demand. Skillnet brings together large groups of companies to support HEIs in identifying needs and addressing ADS gaps, based on the latest market needs and trends.

All stakeholders agree that industry engagement is essential for equipping a workforce with relevant ADS, it is in practice difficult to achieve. HEIs must first investment in programme development and qualifications and involve companies who can contribute market insights and funds. This must be done collectively, creating clusters of companies to identify and confirm common ADS needs.

Here, Slovenia’s resilience fund was presented as a good practice for upskilling teachers and professors and managing the wider education space from primary school to tertiary education and lifelong learning. Encouraging close collaboration between academia and industry, but particularly between HEIs and VET providers, it aims to tackle Slovenia’s need for equipping 20,000 teachers with green digital skills.

While both systems are equally being challenged by the rapid evolution and demands, the specific challenges differ. For example, the access and retention of expert trainers appears to be less of a critical risk to VET providers.

“It's not only a short-cycle initiative. We see it as a priority for our country to actually give people enough skills in the life-long learning field”

Adrijana Hodak, Challenger, author and co-lead, Intercompany training centre

Developers of transferrable ADS

Arguably, HEI's most important role is to develop critical thinking and the ability to synthesise information, alongside digital skills that can be applied across various domains. Universities have traditionally focused on soft skills and intellectual development rather than domain-specific content but have been poor at articulating the importance of doing so. Moving forward, HEIs should not necessarily strive to deliver more courses for technical skills, but rather work with VETs to complement students' skills profiles and promote flexible academic pathways.

“[We need to] make our graduates aware that developing intellectual autonomy is the real value of engaging over a period of time in a domain with a particular lens”

Dave Flynn, Director of Business Networks, Skillnet Ireland

3.3 Topic 3: Addressing key challenges in the context of ADS

Addressing the barriers to the acquisition of ADS to achieve the goal of 12 million ICT specialists by 2030 was a top priority at the HLPW. In this context, the participants were prompted to contribute to a discussion around the following topics:

Developing transnational training materials

Creating study programmes, courses or even educational materials to be utilised across the EU-27 Member States poses several barriers to HEIs and VET providers. In the experience of Birgit Arens, Senior Project Officer at Eurochambres, the main challenges include substantial differences in:

- Required quality parameters.
- Established licensing systems.
- Government arrangements on a national and regional level.

Although the regulatory framework around VETs is typically not as strict, compared to HEIs, differing quality standards in terms of course development and approval are an overarching obstacle. In the past, Eurochambres has attempted to facilitate and speed up this process by reusing elements of existing curricula and adapting them to meet the needs of businesses, particularly in the field of AI and virtual reality. This method reduces the need for time investment.

Accrediting ADS acquired through different learning methods

As a response to the inflexible accreditation process in Europe, a recent approach to digital skills focuses on individuals' competencies rather than official qualifications. In the context of LEADS, but also the HLPW, the need for creating agile pathways between academia and industry, including more flexible entry requirements and recognition of individually earned skills, has been stressed.

While this does not call into question the importance of officially accredited and recognised certificates, career changes are becoming more and more common, and keeping workers professional options open will require them to possess proof of their competencies.

“If we don't provide [them] with accredited objects, which they can cash in later, we may right now be fuelling the next skills gap”

Julie Byrne, LEADS and Trinity College Dublin

HEI staff recruitment

Maja Brkljačić from Algebra University College, a Croatian HEI which also provides a life-long learning centre, analysed and compared the process of recruiting external specialists for higher education and vocational programmes. Even though recruiting external experts for vocational programmes is relatively simple, the specific requirements set by Croatia's national accreditation agency for professors in higher education increase the complexity of the task.

The possession of relevant work experience does not suffice, even if accompanied by a PhD degree in several cases, blocking the path back to academia for esteemed field experts who want to earn a teaching position. This creates a disconnection between active industry players and academia, which hinders the much-needed alignment of ADS and market needs and translates into dissatisfaction and lack of trust on behalf of students.

“The [number] of holdings and degrees [industry experts] have to accumulate to be able to teach at university is simply irreconcilable with their industry jobs”

Maja Brkljačić, Head of the Research Centre Algebra LAB

As such, concerns among professors regarding their relevance for students and the industry are growing. The long duration in combination with the lack of professors with hands-on expertise urge students to pursue lifelong learning programmes, rather than traditional university degrees. In this context, HEIs need to reconsider their approach to staff recruitment, in order to maintain their competitiveness in generating ADS.

Gender balance and inclusion

Europe is strongly encouraging the participation of girls and women in ICT through various initiatives, but the figures show how much effort will be required. Minna Isomursu took the floor to share concerns and good practices from University of Oulu, where she is trying to attract more women into digital programmes. The university's IT and electrical engineering

student cohort is comprised of only 17% women, showing little improvement over the past 20 years. In an attempt to bring more women into ICT and STEM programmes, they are now running online marketing campaigns on platforms, such as Instagram, and while such actions have helped, the major challenge is to make these programmes and courses more appealing by nature.

It is worth noting that at the University of Oulu, the teaching strategy group consists exclusively of men, which may have an indirect negative impact in the study programmes' attractiveness to women. There was general agreement that ADS gender balance and inclusion should not only be considered in terms of student distribution per course, but rather across all areas and operations of HEIs and VET providers.

Intensified efforts should be made starting as early as in primary schools to draw the interests of girls into ICT, STEM and ADS. In this context, universities training primary teachers and providing them with an understanding of the importance of ADS have significant power in shaping the more inclusive digital talent pool of tomorrow.

3.4 Topic 4: Identifying competencies and upskilling ICT job seekers

The need for upskilling and/or reskilling was a recurrent theme at the HLPW, and it was particularly highlighted through two concrete initiatives undertaken by fit4internet, a non-profit association aiming to improve the digital literacy of Austrian citizens:

IT screening project:

Targeted at job seekers with ICT knowledge, this initiative aims to identify specific digital skills among unemployed labour and match them with existing market needs. Even though several job seekers in Austria possess a certain level of digital competency, their perception of which digital skills are sought after by employers does not correspond to reality, and this often hinders their successful return to the workforce. To contextualise the issue, in 2021, Austria faced a shortage of 30,000 ICT specialists, when in Vienna alone 4,500 candidates with ICT knowledge struggled to secure relevant jobs.

The ICT screening project has been developed in collaboration with the Austrian Public Employment Service (AMS), to cover over 500 job profiles, mapped against specific digital skills, on the basis of DigComp AT, an adapted version of the European digital competency framework and the European qualification framework. This way, it addresses digital skills in a structured, standardised way and it promotes the use of common “language” around teaching digital skills across EU Member States.

Participants of the project have to follow three steps that help them determine their digital skills, and provide them with actionable advice on how to adjust them to employers' needs:

- An online self-assessment, including questions on the methods deployed to learn their digital skills.
- An online exam awarding a DIG-CERT certificate provided by Fit4internet and covering all competences areas of the DigComp AT up to level 5.
- A vendor-based test to demonstrate subject-specific knowledge or knowledge linked to specific providers.

At the end of the process, they receive a skills report and upskilling plan for reemployment. These outline a recommended job profile for each participant, their current skills level and qualification recommendations to upskill and/or reskill for the respective job profile.

Digital skills profile platform:

The Digital Skills Profile (DSP), an online platform, also created around DigComp AT and the European qualification framework, facilitates the collective management of individually acquired proof of competencies, which may be formal, non-formal or even informal, accounting for today's increasingly diversified ways of learning. It constitutes a tool for making all digital skills visible and comparable in a standardised way, thus supporting job seekers' employability in ICT.

The users of the platform need to create a unique user profile and ID and usually submit documentation proving their digital skill possession. Subsequently, they need to go through a quality assurance process, which involves authenticity validation of the submitted documents, definition of their competency areas and proficiency levels, and an outline of their learning outcomes. After the validation process, the platform generated a digital skills profile and a combination certificate, bundling together all individually acquired digital skills up to level 8.

3.5 Topic 5: Best practices in ADS acquisition from VET providers

The Spanish Ministry of Education, Vocational Training and Sports

Enhanced vocational training is considered an essential instrument towards improving the supply and quality of ADS in Europe. Several EU Member States have undertaken large scale initiatives to support the provision of vocational education on a national and regional level. A notable example is the reforms enacted by the Spanish Ministry of Education, Vocational Training and Sports, to better predict, plan and deliver ADS through VET providers.

The reforms were driven by the continuous changes observed in the Spanish labour market, as well as the country's objective to lead the green and digital transition. The new vocational training model closely engages companies and industry actors in the design of quick, flexible courses that address the market's principal needs for ADS. Over the past 5 years, more than 30 new vocational training courses have been created, addressing emerging areas, including but not limited to:

- Cybersecurity
- 5G network implementation
- Artificial Intelligence
- Big data
- Maintenance and safety in hybrid and electric vehicle systems installation
- IoT systems maintenance
- Remotely piloted drones

The training opportunities are targeted to people of any age and from any background and are complemented by long-term career guidance support. They allow Spanish citizens to develop new skills, maintain their professional competencies up to date and/or upskill in their chosen field. At the end of the training, the participants' learning outcomes are recognised

through partial accreditation for micro-trainings or full accreditation for specialisation courses and VET masters.

Besides flexibility, particular emphasis is placed on the relevance of such trainings for the students' careers and employability. To this end, in 2023, the Ministry of Education, Vocational Training and Sports signed an agreement with 5 of the largest technology companies in Spain, in order to create a technological hub that can boost private-public cooperation, identify the most requested ADS profiles and collaboratively work in that direction. Through this hub, the technology companies can propose specific areas of interest, in relation to ADS, to be funded under the Ministry's relevant open calls.

Mondragón University

As a small HEI operating as part of a larger industrial group, Mondragón University is distinct in its close cooperation with the industry. Its primary focus is on engineering, offering several undergraduate and master's degrees, specialised training programs and life-long learning courses in digital technologies, as well as both unpaid and paid internships with varying hours of commitment. In fact, it recently launched a pilot programme which integrates practical work experience from the first year of study.

This programme comes as a result of the aforementioned reform enforced by the Ministry of Education, Vocational Training and Sports, which renders the Spanish VET system dual, i.e. allowing students to spend significant time at companies from the onset of their studies. Specifically, the reform introduces two types of dual VET modalities: general and intensive. The intensive track requires students to spend at least 30% of their program duration in the workplace, significantly enhancing their practical skills and learning outcomes.

Overall, the provision of vocational training at Mondragón is sustained by the increasing demand for ADS but is also seen as critical for maintaining a high employment rate for graduates, reflecting the university's strong ties with key industry players.

“For us, it's important to be part of an industrial group, because it helps us maintain a nearly 100% employment rate for our students”

Carlos García, General Manager, Mondragon University

Mondragon's effective integration of vocational pathways into higher education is best exemplified by its tailored mechatronics degree, designed specifically for vocational training graduates, enabling them to complete an engineering degree in a shorter timeframe. As previously established, the long duration of academic degrees deters students and graduates that want to upskill or reskill from returning to HEIs, but this specific initiative can become a paradigm for addressing the issue.

Finally, despite the challenge of balancing vocational training with university-level teaching and research, particularly coordinating university and company staff while delivering both academic and industry-oriented tasks, certain elements enable Mondragón to do so:

- The university is committed to fostering strong regional engagement and technological transfer.

- It prioritises regional partnerships and student employment within local industries.
- There is a growing awareness among companies about the importance of digitally skilled apprentices.
- Companies recognise that investing in training students pays off as they become skilled workers who can quickly adapt to their industry demands.

3.6 Topic 6: Opportunities and strengths across EU education and training contexts

Microcredentials and nano degrees for ADS alignment with industry needs

At the open discussion session at the HLPW, the conversation concentrated again around the need for flexible, short-term training modules tailored to the needs of professionals in the workforce. According to a Eurochambres survey of 700 companies across 8 countries, only 21% currently utilise key digital technologies such as AI in their normal operations, indicating a significant gap between available technology and its practical application in the workplace. The companies expressed mixed feelings about the available ICT skills and ADS of their employees, suggesting that there is an urgent need to enhance the broader spectrum of digital competencies in the talent pool. Larger companies often take the initiative in upskilling or reskilling their workforce independently, without waiting for educational institutions to develop the courses they need. SMEs, however, lack the necessary experience and resources to do so. As such, they are subject to the disconnect between the speed of industry advancements and the slow pace at which new academic programmes are approved and implemented.

“It can take over a year for a new degree programme to be officially approved and [by the time students graduate] in six years, everything [in the industry landscape] will have changed”

Eduardo Vendrell, honorary member of Conference of Directors and Deans of Computer Science Engineering of Spain (CODDII)

This lag makes it difficult for universities to keep their curricula relevant, for graduates to remain competitive in the job market, as well as for companies and SMEs to meet their human capital needs. Flexible education systems, including micro-credentials or nano degrees, are a potential solution which can provide more immediate and practical skills alignment with industry needs.

Redesigning vocational training programmes

The collaborative efforts between VET providers and HEIs are translating into an emerging trend of integrating applied research and problem-based learning in vocational training. Universities of applied sciences are typically able to adapt more quickly to market needs, and are more inclusive in terms of genders, especially in digital technology fields, compared to theory-focused HEIs. In this regard, incorporating applied science elements in VET can foster a dynamic exchange of expertise among students, industry professionals and educators, creating a responsive, up-to-date educational environment.

Common European data spaces

Under the DIGITAL programme, the EC aims to develop and deploy a secure and trusted European data space for sharing and accessing skills data for various purposes, from analytical and statistical purposes to policy development or re-use in innovative applications in line with European values.

This initiative is seen as an opportunity to foster better exchange and use of data to inform education and training strategies in Europe, which would address the current lack of homogeneity in terms used in forecasting skills and help align educational outputs with labour market demands more effectively.

4 CONCLUSIONS

The High-Level Policy Workshop (HLPW) held in Brussels on April 17, 2024, convened stakeholders from diverse sectors to address the pressing need for Advanced Digital Skills (ADS) in Europe. The workshop highlighted the importance of a coordinated approach between Higher Education Institutions (HEIs), Vocational Education Training (VET) providers, industry players, and policymakers to bridge the skills gap and meet the digital economy's evolving demands.

4.1 Collaborative ecosystem approach

A recurring theme throughout the workshop was the need to foster a collaborative ecosystem. HEIs and VET providers were encouraged to blur the traditional boundaries that separate them, to allow for more flexible educational pathways. This approach will support the flexibility required to adapt to the rapid technological changes and ensure that graduates are equipped with relevant skills, when those skills are needed.

Examples from the Spanish Ministry of Education and Mondragón University highlighted the success of dual vocational training models and the importance of practical experience in education. These models demonstrate the effectiveness of close cooperation between academia, industry and policy in creating a skilled workforce.

4.2 De-risking experimentation and innovation in HEIs and VETs

Innovation in educational approaches was another critical point of discussion. The concept of a “playground” or “safety net” for HEIs to experiment with new teaching methods and course offerings without the constraints of traditional accreditation processes was explored. In particular, Denmark's rapid accreditation model could serve as a blueprint for allowing educational institutions to adapt quickly to industry needs. This model has proven to reduce the burden of documentation and facilitates swift changes, helping training providers keep content current and aligned with market demands.

4.3 Anticipating the return on investment

Investing in ADS development is not only beneficial for individual learners but also for the broader economy. Companies and educational institutions alike must recognise the value of training and upskilling programs as strategic investments. Initiatives like the European Commission's Cybersecurity Skills Academy and the Action Plan on Labour and Skill Shortages highlight the importance of aligning educational outputs with industry needs to maximise the efforts' return on investment.

4.4 Key points for policy engagement

Policymakers play a pivotal role in shaping the landscape for ADS development. The workshop called for policy frameworks that support flexibility in education, encourage gender diversity in ICT and STEM fields, and facilitate the use of shared data spaces for skills assessment and planning. The involvement of companies and SMEs in these discussions is crucial to ensure that the developed policies cater to the needs of all stakeholders involved in the digital transformation.

ANNEX: WORKSHOP AGENDA

	Item	Description
09:15	Arrival and registration	
09:30	Welcome Rehana Schwinniger-Ladak <i>Head of Unit, DG CONNECT, Unit G.2, Interactive Technologies, Digital for Culture and Education.</i> Ana Carrero <i>Deputy Head of Unit, DG EMPL, Unit B.3, Vocational Education and Training, CEDEFOP.</i> Anusca Ferrari <i>Policy Officer, DG EAC Unit C.4, Education, Youth, Sport and Culture.</i>	Opening presentation by the European Commission that outlines the context for the discussion and expectations for the day.
10:00	Scene setting and session outline Brendan Rowan <i>Managing Consultant, BluSpecs, LEADS Coordinator.</i>	Provision of context for the discussions to include key data and observations related to the challenges and practical overview of the sessions.
10:20	Opening position statements Theodor Grassos <i>Secretary General, European Association of Institutes of Vocational Training.</i> Beatrice Boots <i>CEO, Platform Talent voor Technologie</i> Olha Hunchak <i>Policy and Project Officer, European Association of Manufacturing Technologies</i> Martin Hayes <i>Professor of Digital Technologies, University of Limerick.</i>	Participants are invited to submit an expression of interest to provide a short statement of their position on the topics and questions to be addressed.
10:45	Coffee Break	
11:10	Case Study 1: Rapid accreditation within HEI – responsive policy approaches David Metz <i>Senior Advisor of the Danish Accreditation Institution.</i>	Presentation of the innovative and flexible approach developed in Denmark to support the rapid approval of courses and modules across HEIs.
11:30	Moderated discussion: The specific context for ADS and existing barriers Moderators: Julie Byrne <i>Assistant Professor in Online Education & Development at Trinity College Dublin.</i>	<ul style="list-style-type: none"> Where do you see the role of higher education vs VET in producing the appropriate skills/profiles? Over the past two years, we have encountered consistent barriers; time availability and the expertise to

	<p>Jacob Nielson <i>Associate Professor, SDU Metaverse Lab, The Maersk Mc-Kinney Moller Institute.</i></p>	<p>develop at the cutting edge. What is your experience of this?</p> <ul style="list-style-type: none"> • What would it take to bridge this gap, that is partly responsible in supply generation? • With the fast changes in what ADS are requested by industry, how can educations adapt rapidly enough to match this?
13:00	Lunch break	
14:00	<p>Case Study 2: Identifying skills competences and upskilling of IT skilled job seekers Valerie Michaelis <i>Deputy Secretary General, Fit4internet, Pact for Skills and Digital Skills and Jobs Coalition.</i></p>	<p>Sharing the experience of deploying a certification and recognition framework for IT specialists to map against market needs and develop specific training for reinsertion into the labour force.</p>
14:15	<p>Case Study 3: Driving the acquisition of advanced digital skills through VET and HEI. Lydia Berrocoso Rufo <i>Head of International Relations for V, Spanish Ministry of Education, Vocational Training and Sports.</i> Carlos García Crespo <i>Director, Mondragón University.</i></p>	<p>Combined approach of both HE and VET for the delivery of high-tech programmes and courses.</p>
14:40	<p>Discussion: Opportunities and strengths across the EU Education and Training Contexts Moderators: Brendan Rowan, <i>Tech, Policy and Skills, BluSpecs.</i> Eugenia Kypriotis, <i>Skills PM, Martel Innovate.</i></p>	<p>What are the specific opportunities for collaboration and relative strengths in addressing the following target profiles: ICT Specialists, “ICT adjacent”, domain experts and non-STEM graduates or non-graduates.</p>
16:10	<p>Conclusions and takeaways Rehana Schwininger-Ladak, <i>DG CNECT.</i></p>	
16:30	Close	

