DIGITAL SKILLS AND PROFESSIONAL DEVELOPMENT: BUILDING BRIDGES BETWEEN ACADEMIC EDUCATION AND DIGITAL LABOR MARKET

DOI: 10.26341/issn.2241-4010-2025-12a-1-K02242

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Abstract
The world of work is rapidly changing, driven by the relentless march of digitalization. Even before the COVID-19 pandemic threw everything into overdrive, employers were struggling to keep pace, searching for ways to upskill their workforce for emerging technologies and new business models (Cedefop, 2021). This situation has made it crystal clear that our education systems need to step up and better prepare students for a digital-first work environment, equipping them with the skills they need to thrive.

Another key trend is the growing popularity of freelance and "gig" work, much of it facilitated by digital platforms. Over the past decade, more and more workers, including many bright young graduates, have been drawn to freelancing or self-employment, attracted by the promise of flexibility and control over their careers. Europe's freelance workforce is estimated at around twenty million people, representing roughly 8–9% of the total workforce (Talent Monitor). While this share has remained fairly stable recently, younger folks under 30 still make up only a small slice of the freelancer pie (Talent Monitor). Many new graduates hesitate to jump into freelance careers right after university, and it's not hard to see why. They face barriers like a lack of business know-how, limited professional networks, and uncertainty about how to find clients. However, encouraging entrepreneurial ventures and freelancing among young people is seen as a way to spark innovation and tackle graduate unemployment. So, ensuring that graduates possess both the digital skills and the entrepreneurial savvy to succeed as independent workers is becoming a vital goal for higher education.

To reduce the gap between what's taught in classrooms and what's needed in the digital labor market, we need new and fresh approaches to pedagogy, curriculum design, and career development services. Universities are increasingly expected to team up with businesses and

policymakers to make sure learning outcomes match real-world skill needs. Universities are tackling this challenge through work-integrated learning, industry projects, and targeted training courses in digital and professional skills. The European Commission's Digital Skills and Jobs Coalition emphasizes that all sectors (public, private, educational) should work together to upscale skill development, promoting multi-stakeholder partnerships to close the digital skills gap.

The Digital Freelancing (DiFree) idea originated in exactly this environment. Under co-funding by the Erasmus+ program (2022–2025), DiFree is a transnational initiative including Italian, Spanish, Greek, Portuguese universities and research partners. Emphasizing freelancing and self-employment especially, DiFree seeks to "build bridges" between academic knowledge and the skills needed in the digital labor market. Stated differently, it aims to give recent graduates and students the targeted skill development chances they need to flourish in the realm of digital freelancing. The results of the DiFree program are presented in this paper together with an examination of its approach in the larger framework of digital skills and professional development. Analyzing DiFree's goals, programs, and outcomes can help us to find practical means of bringing digital technologies and entrepreneurial skill-building into higher education.

This paper is organized as follows: We will first give a synopsis of pertinent policy background and literature including digital skills development, entrepreneurial education, labor market changes, the function of creative hubs and career services. We will then discuss our approach, stressing how data from the DiFree software and associated sources were compiled and examined. We will then highlight important findings from the DiFree case study—the objectives of the program, the tools and resources it produced, and how it affected graduates and active participants. These findings will be examined in view of the body of current research, and we will derive policies and educational practice recommendations. At last, the conclusion will list the salient features and provide recommendations for next research and initiatives meant to close the gap between academic knowledge and the expectations of the digital labor market.

Key words: *digital skills, european programme, education and training, labor market*

Literature Review

Digital Skills Development and Gaps

Apart from swift technological development, the demand for digital skills in the job market is continually growing. Now considered as fundamental as reading or arithmetic is digital literacy, the ability to boldly use computer tools and services. Surveys frequently illustrate how vital digital skills are to recent graduates, even in fields unrelated to conventional IT. For example, a recent corporate study noted that among the most important skill shortages noted in recent graduates entering digital contexts are communication and teamwork (Tee et al., 2024). Studies usually rank digital content production, safety (cybersecurity awareness), digital communication and collaboration, digital information and data literacy, and problem-solving as the most important digital skills. Creating engaging digital content, including video, is also becoming more crucial and calls both media literacy as well as technical knowledge (Kaperonis, 2021).

The rapid development of artificial intelligence is further complicating things by changing how businesses connect with their consumers. This underlines how basic artificial intelligence literacy should be based on digital capability. Kaperonis (2024) underlines that

awareness of how AI is altering the User Experience in Digital Marketing is very crucial since AI-driven solutions are used for personilized content, automate marketing duties, and deliver important, data-driven insights. If digital marketers are to remain competitive, they have to keep up with novel ideas include using AI for search engine optimization, social media marketing and content creation (Dwivedi et al., 2023).

Reflecting the five competency areas set by the DigComp framework of the EU, these categories offer a shared basis for what it means to be digitally competent. Although "communication and collaboration" are expected to become even more important in the near future, a study in an Industry 4.0 environment indicated that "information and data literacy,""digital content creation," and "problem-solving" are currently the most sought-after digital abilities. It's worth noting that the largest skills gaps identified were in those "soft" digital skills. Employers reported that graduates often lacked strong communication and collaboration skills, as well as sufficient digital safety awareness. These findings suggest that educational programs need to go beyond simply teaching technical ICT skills. They must also cultivate the soft skills and digital mindset required to effectively use technology in teams and business processes. The European Digital Competence Framework (DigComp) has been widely adopted to guide digital skill development initiatives, outlining a progression of proficiency levels (from foundational to advanced) across key competencies. However, implementing such frameworks in higher education can be challenging. Many university programs still seem to assume students will pick up digital skills on their own, which may not be enough to meet the demands of the labor market.

The COVID-19 pandemic dramatically highlighted both the importance of digital skills and the potential consequences of skills gaps. With the sudden shift to remote learning and remote work, students and workers who were digitally savvy were able to adapt much more easily, while those lacking digital skills faced significant challenges. The pandemic accelerated the demand for digital skills in many occupations, even those outside of traditional IT (Cedefop, 2021). Teachers, office workers, and professionals in various fields had to quickly improve their digital tool usage to keep things running during lockdowns. As a result, educational institutions are now integrating digital competencies more explicitly into their teaching, with a stronger emphasis on digital skills certification for students, investments in educational technology, and teacher training in digital pedagogies.

Despite this progress, disparities persist. Digital skill levels often vary significantly by region, age group, and socioeconomic background (Cedefop, 2021). This means that any solution to the skills gap must be inclusive, ensuring that everyone has opportunities to develop these vital competencies. For universities, this could involve offering extra digital skills workshops for students in non-technical fields and providing personalized support to those who may have lower initial proficiency.

Entrepreneurship Education and Self-Employment

Along with digital skills, entrepreneurship education has grown in importance in academia as teachers try to equip their students for a constantly shifting professional path. Entrepreneurship education is the instruction in knowledge, skills, and attitudes required to start and run new businesses or to be entrepreneurial inside current companies. Training in opportunity assessment, company planning, financial literacy, innovation, and fundamental soft skills including creativity and leadership is also quite important.

Encouragement of entrepreneurship in higher education serves two primary purposes. First of all, developing an entrepreneurial attitude helps graduates to be more generally employable. Companies highly reward initiative, adaptability, and problem-solving even if they do not launch their own companies. Second, formal entrepreneurship education helps

students who select self-employment or startup routes increase their odds of success and inspire more to investigate these choices. In areas suffering significant youth unemployment, where enabling young people to start their own businesses becomes a strategic focus, this is especially pertinent.

Empirical research consistently supports the positive impact of entrepreneurship education. A meta-analysis of 36 studies (involving nearly 30,000 students) found that participation in entrepreneurship education is significantly associated with higher entrepreneurial intentions among college students. In other words, students who receive entrepreneurship training are more likely to plan to start their own businesses or pursue self-employment, particularly in environments where such careers are supported. The meta-analysis noted that the strength of this effect can vary from country to country, but the overall relationship is still a positive one. This indicates that well-designed educational interventions can indeed foster an entrepreneurial spirit and motivate more graduates to pursue innovative ventures or freelance careers.

The European Commission's EntreComp framework provides a broad definition of entrepreneurship competence as the ability to act upon opportunities and ideas to create value for others, whether that value is social, cultural, or economic. EntreComp breaks this down into 15 key competencies (such as spotting opportunities, mobilizing resources, taking initiative, and learning through experience) across the areas of Ideas & Opportunities, Resources, and Into Action. The framework is intentionally holistic, emphasizing that entrepreneurship is not just about business creation but also about creativity, problem-solving, and the ability to mobilize others. For higher education, EntreComp provides a useful blueprint for curriculum development. Courses and programs can align learning outcomes with EntreComp competencies to ensure that students are developing the relevant skills.

To encourage students to create entrepreneurial enterprises, many colleges have added entrepreneurship classes, innovation laboratories, incubator programs, and mentoring initiatives. Experiential learning elements, such as starting a company in a capstone project, advising for a real small firm, or participating in hackathons, often find their way into these programs. Such practical exercises allow students to engage in controlled risk-taking and creative expression. Involving business leaders and entrepreneurs as mentors or guest speakers also provides students with valuable insights and relatable role models. Entrepreneurship education can be particularly valuable for graduates seeking freelancing jobs, as they are essentially independent entrepreneurs offering their skills and services. Freelancers need to market themselves, handle client relationships, manage legal and financial matters, and constantly find innovative ways to deliver their services. These tasks reflect many facets of running a small business. While traditional entrepreneurship classes might not specifically focus on freelancing, the core entrepreneurial skills are equally applicable to independent professionals and gig economy workers. Understanding how to identify market needs, build a personal brand (analogous to a corporate brand), manage project finances, and leverage networks can be incredibly helpful for a freelancing graphic designer or software developer.

Digital Labor Market Trends and Higher Education Response

The digital transformation of the economy has introduced new labor market dynamics that universities need to consider. One major trend is the increasing importance of continuous learning and upskilling throughout one's career. The "half-life" of technical skills is shrinking. Technologies can become obsolete in a matter of years, so workers need to regularly acquire new skills to stay relevant. This reality is prompting a shift in how we view higher education, moving away from a one-time preparation for a lifelong career and toward the foundation for

lifelong learning. Universities are gradually incorporating more emphasis on learning agility and digital learning skills (for instance, knowing how to independently pick up new software or a new programming language). Some institutions are establishing alumni upskilling programs and micro-credential courses, so graduates can return and update their skill sets.

The labor market is also experiencing a blurring of boundaries between traditional employment and self-employment. Many professionals now pursue mixed careers, starting in a salaried job and then moving to freelancing, or vice versa, at different points in their lives. Recent research has noted that the proportion of self-employed workers in the EU hasn't really increased over the past decade. In fact, it slightly declined from 15.4% to 13.7% between 2010 and 2022 (Eurofound, 2024). This indicates that, while interest in freelancing and gig work is definitely there, structural challenges and uncertainties might be limiting growth in this area. These changes call for career guidance and professional development training that are versatile and able to support individuals through career transitions.

For young graduates, entering the workforce can be particularly challenging if they're aiming to join the freelance economy. As we mentioned earlier, relatively few new graduates immediately start their own businesses or work as freelancers. However, a supportive ecosystem can definitely make a difference. Universities are increasingly partnering with industries and creating freelancer support programs, such as freelancing workshops, career services tailored to independent work, and networking events that connect students with freelance professionals. These efforts strive to demystify freelancing as a career option and provide students with the tools and contacts they need to get started. Early intervention can build confidence, and individuals who receive entrepreneurial training and mentoring often feel more capable of starting their own ventures.

Creative Hubs and Career Services in Higher Education

A notable development in this evolving ecosystem is the emergence of creative hubs and the transformation of university career offices into modern career development hubs. Creative hubs broadly refer to spaces (physical or virtual) that facilitate collaboration among creative and entrepreneurial professionals. Digital freelancing, as part of the creative economy, is strongly related to hubs, under whatever title they bear: co-working spaces, studios, incubators, accelerators, districts, quarters or zones, to name but a few. Pratt, Virani and Gill (2019, p. 2) notice that de-spite the widespread credo in the importance of creative hubs, academic research about them is scarce while "there exists a kind of unquestioned faith in hubs – despite – or more tellingly perhaps because – their meaning is not always clear." They are immersed into the everyday working practices (including networking) of cultural workforce including (digital) freelancers, due to the structural and organizational changes in those sectors since the 1990s. In several cases, universities operate creative hubs to facilitate industry-academia collaboration. Examples include the Digital Creativity Labs at the University of York and the CoAST Research Group at Canterbury Christ Church (Ashton and Comunian 2019).

On the other hand, career services in higher education have undergone significant transformations over the 20th century, shaped by socioeconomic changes, technological advancements, and generational shifts. From vocational guidance in the early 1900s to job placement initiatives in the post-WWII decades and career counseling in the 1970s and 1980s, each phase reflected the evolving needs of students, employers, and institutions. Since the 1990s, career services evolved from the traditional job placement model into networking hubs that integrate employer engagement, digital tools, and community-based career development (Dey and Cruzvergara 2014). During this period, career services transitioned from being a

primarily advisory function to proactively engaging with corporate recruiters, alumni networks, and external stakeholders.

The 2008 global financial crisis intensified debates about the return on investment (ROI) of higher education. Universities faced increased pressure from students, parents, policymakers, and employers to demonstrate tangible career outcomes. This era also saw career services expand beyond transactional services (e.g., job postings, career fairs) to relationship-based engagement through employer partnerships, mentoring, and experiential learning opportunities. The traditional career office model – where students passively sought help with résumés and job applications –became outdated. The 2010s and early 2020s ushered in the career hub model, which emphasized community-based career support networks, where students, alumni, faculty, and employers interact in structured ways; career services as facilitators rather than direct job matchmakers; Personalized career pathways, using AI-driven career advising tools; Lifelong career support, expanding services to alumni long after graduation.

In this new model, career services became embedded into the university's culture rather than existing as an isolated office. Universities such as Stanford, University of Chicago, and Wake Forest led the shift by rebranding career services into integrated career ecosystems. The concept of hubs represents a network-centric model where career centers facilitate connections rather than merely providing information. Thus, the hub-based model aligns with the changing job market, where career paths are nonlinear, interdisciplinary, and reliant on lifelong learning. Even more, it is expected that university career centers will become lifelong career partners, providing continuous upskilling and reskilling services, as well as career services for life.

Combining Hubs and Career Services in Higher Education: The DiFree physical and digitial Hub

The DiFree project[1] proposed – among others – the creation of a specialized Freelance Hub, where the target groups will find accurate and reliable information, guidance, mentoring programs, opportunities for life-long training, upskilling and reskilling. It was expected to focus on transversal competencies and soft skills providing students and graduates with a space to meet, share knowledge, organize gatherings and events, invite personalities from the freelance community, etc. In other words, the vision was incorporating the framework envisioned for the future of higher education career offices, organizing an ecosystem where exchange of experience and experiential learning would proliferate, and technology would play a pivotal role.

The Hub is installed physically within Panteion University's career office, adding value to its services to students and recent alumni, as well as to the students and alumni of the University's Lifelong Learning Center, and opening it to an external public interested in freelancing. It also adds value to the services provided to stakeholders such as companies and organizations of the private and public sectors. It is complemented by a digital Hub,[2] offering access to the project's outcomes such as an e-book on Freelancing in the partners' countries, online courses on freelancing, or a self-evaluation and self-vocational online assessment tool developed by the Universidad de Cádiz. It is also providing links to resources regarding freelancing in the participant countries, as well as the opportunity to arrange either in-person or online counseling by Panteion University's career office.

[1] See https://www.difree-project.it/ (last visit 31/3/2025)
[2] See https://difree-hub.eu/(last visit 31/3/2025).

Conclusion

As the pace of digital skills requirements in career development is evolving, educational institutions and especially Higher Education Institutions face new challenges. They include the introduction of entrepreneurship and 'soft' digital skills into the curriculum and providing opportunities to their students to get familiar with a changing vocational ecosystem. In this ecosystem career offices may contribute by providing information and mentorship, not only to their traditional inner publics, but also to external publics as well, leading to extrovert functions and services, opening up the Higher Educations to their corresponding communities. DiFree has created a model Hub, both physical and digital, to support such functions. Its outcomes in the next months or years will provide insights on its viability, as well as on improvements needed.

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