



Capacity building programs for HEIs in both European and African contexts & identify best practices for enhancing HEIs capacity to address market labor unmet needs in digital innovation sectors, as well as entrepreneurial skill gaps

26th December, 2024

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Partners



Deliverable 2.1 – State of the Art Report

Executive summary.....1
Key Insights from the State-of-the-Art Analysis2
Introduction3
HEIs and Labour Market Alignment: Current Evidence 4
Structural Conditions Affecting HEIs 9
Conclusion10
References 11



Document History

| Activity | Responsibility | Date |
|--|---------------------------|--------------|
| Initial outline and structure of the State of the Art Analysis | Hapa | 11 Jul. 2024 |
| First draft with integrated literature and policy review | Hapa | 25 Jul. 2024 |
| Consolidated draft incorporating partner inputs | Hapa | 26 Jul. 2024 |
| Internal review and comments | Stimmuli & other partners | 24 Oct. 2024 |
| Revised draft following partner feedback | Hapa | 07 Nov 2024 |
| Final quality review and validation | RSM | 18 Nov 2024 |



1. Executive summary

This report presents an analysis of capacity-building programmes designed to enhance the ability of Higher Education Institutions (HEIs) in Europe and Africa to respond to labour market demands in digital innovation and entrepreneurship. As the global economy becomes increasingly digital, HEIs face growing pressure to modernise their curricula, teaching approaches, and partnerships to equip graduates with relevant, future-ready skills. The study examines successful initiatives across diverse contexts and identifies key best practices and strategic recommendations to address existing skills gaps.

A central finding of the analysis is the importance of embedding entrepreneurship within academic curricula. Leading examples demonstrate that integrating practical business skills, innovation, and problem-solving into degree programmes enables students to develop an entrepreneurial mindset and respond effectively to real-world challenges. This approach not only enhances employability but also contributes to job creation and economic resilience.

The report further highlights the critical role of strong collaboration between academia and industry. Effective partnerships provide students with access to internships, mentorship, and hands-on learning opportunities, ensuring that educational programmes are aligned with market needs. Such collaborations also facilitate knowledge exchange and help institutions remain responsive to emerging trends in the digital economy.

Another key insight is the increasing relevance of digital technologies and blended learning models. The use of online platforms and hybrid teaching approaches expands access to education, particularly in underserved areas, while also strengthening students' digital competencies. These models provide flexibility and scalability, making them essential tools for modern higher education systems.

Interdisciplinary learning is also identified as a significant driver of innovation and employability. Programmes that encourage collaboration across different academic disciplines enable students to engage in industry-relevant projects, fostering critical thinking, teamwork, and problem-solving skills. This holistic approach prepares graduates to navigate complex professional environments and adapt to evolving labour market demands.

Building on these insights, the report proposes a set of strategic actions to strengthen HEIs' responsiveness to labour market needs. These include integrating entrepreneurship across all disciplines, deepening industry partnerships, adopting blended learning approaches, and promoting interdisciplinary collaboration alongside continuous professional development for educators. Together, these measures provide a practical framework for enhancing institutional capacity, improving graduate employability, and fostering stronger links between higher education, industry, and innovation ecosystems in both African and European contexts.

Key Insights from the State-of-the-Art Analysis

1. Growing Need for Market-Aligned Education:

HEIs are increasingly required to align their programmes with labour market needs, particularly in digital innovation and entrepreneurship. The analysis reveals a persistent gap between academic training and industry expectations, with many graduates lacking practical, job-ready skills.

2. Importance of Entrepreneurship-Driven Curricula:

Integrating entrepreneurship into academic curricula is a key strategy for enhancing student outcomes. Such approaches equip students with critical thinking, innovation, and business skills, enabling them to create solutions and pursue both employment and entrepreneurial opportunities.

3. Strengthening Industry-Academia Collaboration:

Strong collaboration between HEIs and industry is essential for ensuring relevance. Partnerships that include internships, mentorship, and co-designed programmes provide students with hands-on experience and improve the alignment between education and labour market demands.

4. Adoption of Digital and Blended Learning Models:

The use of digital tools and blended learning models is expanding access to education and improving flexibility. These approaches are particularly valuable in resource-constrained settings, while also strengthening students' digital competencies.

5. Value of Interdisciplinary and Experiential Learning:

Interdisciplinary and experiential learning approaches play a crucial role in preparing students for complex work environments. By engaging in real-world projects, students develop collaboration, problem-solving, and adaptability skills.

2. Introduction

The UNIHUBS project – Fostering Innovation in African Higher Education Institutions to enhance their relevance for the digital innovation labour market – is a 36-month Erasmus+ Capacity Building in Higher Education initiative that aims to strengthen the role of Higher Education Institutions (HEIs) in responding to evolving digital innovation and labour market demands. Across both European and African contexts, higher education systems face persistent challenges related to graduate employability, skills relevance, and effective engagement with innovation ecosystems, particularly in light of rapid technological change and shifting economic structures.

Deliverable D2.1 provides a State of the Art Analysis that establishes an analytical baseline for the UNIHUBS project at its outset in 2024. The purpose of this report is to review and synthesise existing academic literature, policy frameworks, and strategic analyses relating to digital innovation, entrepreneurship education, and HEI–labour market alignment in Europe and Africa. The report does not assess UNIHUBS partner institutions, nor does it identify solutions or exemplary practices. Instead, it focuses on analysing prevailing approaches, structural trends, and unresolved challenges documented in existing knowledge sources.

By adopting a comparative perspective, the report recognises both shared and context-specific dynamics across European and African higher education systems. The analysis presented in this deliverable provides the conceptual and contextual foundation for subsequent project activities, informing later deliverables such as the Best Practices Report (D2.2) and the Needs Analysis Report (D3.1), as well as the design of capacity-building and piloting activities in later work packages.

This State of the Art Analysis is guided by a conceptual framework derived from existing literature in higher education studies, innovation systems theory, and employability research. The framework is used as an analytical lens to interpret existing knowledge and does not represent an intervention model developed within the UNIHUBS project.

Digital innovation skills are understood as a combination of technical competences, such as digital literacy and familiarity with emerging technologies, and transversal skills, including problem-solving, collaboration, adaptability, and critical thinking. These competences are widely recognised in the literature as increasingly essential across sectors and disciplines, reflecting the pervasive role of digital technologies in contemporary economies.

Employability is conceptualised as a dynamic and long-term capacity, rather than as immediate employment outcomes. From this perspective, higher education contributes to employability by fostering transferable skills, learning autonomy, and the ability to navigate changing professional contexts. Entrepreneurship education is similarly understood in broad terms, encompassing the development of initiative, creativity, opportunity recognition, and value creation, rather than focusing solely on business start-up formation.

Innovation ecosystem theory provides an additional analytical lens, positioning HEIs as knowledge actors embedded within broader networks that include industry, public institutions, and intermediary organisations. Within this context, Digital Innovation Hubs (DIHs) and similar intermediaries are commonly described in the literature as boundaryspanning actors that facilitate collaboration, knowledge exchange, and practical engagement between academic and non-academic stakeholders. This conceptual framing informs the analysis presented in this report and underpins its examination of HEI–ecosystem relationships.

2.2. Policy and Strategic Context

The issues addressed in this report are situated within a policy environment that increasingly emphasises digital transformation, skills development, and innovation-led growth. In the European context, higher education policy frameworks highlight the need to modernise teaching and learning, integrate digital technologies, and strengthen connections between education, research, and labour markets. These priorities are reflected in strategic agendas that promote employability, lifelong learning, and entrepreneurship as central objectives of higher education reform.

Similarly, policy frameworks at continental and national levels in Africa emphasise the role of higher education in supporting economic transformation, youth employment, and digitalisation. Strategic documents consistently identify digital skills development, innovation capacity, and entrepreneurship as key enablers of inclusive growth. At the same time, the literature highlights ongoing challenges related to institutional capacity, infrastructure, and the effective implementation of policy objectives within higher education systems.

Across both European and African contexts, policy discourse converges around shared priorities, including curriculum relevance, experiential learning, industry engagement, and ecosystem collaboration. However, existing analyses also document persistent gaps between policy ambitions and institutional practice. These gaps are commonly associated with structural constraints such as governance rigidity, limited incentives for pedagogical innovation, uneven access to digital resources, and fragmented collaboration with external stakeholders.

By situating the UNIHUBS project within this policy and strategic landscape, the State of the Art Analysis clarifies the systemic conditions that shape HEI engagement with digital innovation and labour market needs. This context provides a necessary foundation for understanding the challenges addressed by the project and for interpreting the relevance of subsequent UNIHUBS activities and deliverables.

3. HEIs and Labour Market Alignment: Current Evidence

Extensive academic and policy literature documents persistent challenges in aligning higher education provision with labour market needs, particularly in the context of digital transformation. These challenges are commonly framed in terms of skills mismatches, where graduates possess strong disciplinary knowledge but lack applied, digital, and transversal competences required by employers (Yorke, 2006; OECD, 2019). Importantly, the literature emphasises that employability should be understood as a systemic outcome shaped by institutional structures and learning environments, rather than as a narrow measure of immediate employment (McQuaid & Lindsay, 2005).

One of the most frequently cited structural causes of misalignment is the limited responsiveness of higher education curricula to changing labour market demands. Studies highlight that curriculum reform processes within HEIs are often slow and constrained by accreditation requirements, governance arrangements, and disciplinary traditions, making it difficult to integrate emerging digital and innovation-related competences in a timely manner (Barnett, 2000; Teichler, 2007). As a result, many programmes struggle to keep pace with technological change and evolving occupational profiles.

The literature further identifies weak and fragmented feedback mechanisms between HEIs and labour market actors as a critical constraint. While collaboration with employers and industry is widely promoted in policy discourse, empirical research suggests that such engagement is frequently project-based, informal, or peripheral to core teaching and learning activities (Perkmann et al., 2013). This limits the capacity of institutions to systematically incorporate labour market intelligence into curriculum design and pedagogical practice.

Comparative analyses indicate that these challenges are present across both European and African higher education systems, albeit with differing contextual characteristics. European HEIs generally operate within more mature labour markets and benefit from stronger institutional linkages with industry, yet continue to face difficulties related to graduate employability in rapidly evolving digital sectors (OECD, 2019). In African contexts, these challenges are compounded by resource constraints, uneven access to digital infrastructure, and limited industry density in certain regions, contributing to higher levels of graduate underemployment and skills mismatch (UNESCO, 2017).

Overall, the reviewed literature converges on the conclusion that misalignment between higher education and labour markets is a structural and systemic issue. Addressing it requires institutional approaches that move beyond isolated curriculum updates towards more integrated models of teaching, learning, and external engagement. This evidence provides a critical analytical foundation for understanding the relevance of initiatives that seek to strengthen HEI collaboration with innovation ecosystem actors and enhance the practical orientation of higher education provision.

4. Structural Conditions Affecting HEIs

3. Structural Conditions Affecting HEIs This section examines the structural conditions highlighted in academic and policy literature as influencing how Higher Education Institutions in Europe and Africa respond to digital innovation and labour market demands. It considers systemic dimensions related to digital innovation and entrepreneurship, pedagogical practices, ecosystem engagement, and institutional capacity, providing a comparative context for the subsequent synthesis of gaps and implications for the UNIHUBS project.

4.1. Digital Innovation and Entrepreneurship in Higher Education

Digital innovation and entrepreneurship have become central themes in higher education policy and research, reflecting their importance for economic competitiveness, employability, and societal transformation. International policy and academic literature increasingly emphasise the need for HEIs to equip students with digital, entrepreneurial, and transversal competences that extend beyond traditional disciplinary knowledge (OECD, 2018; World Economic Forum, 2020).

Existing studies indicate that approaches to digital skills development in higher education vary considerably across institutions and regions. Common models include stand-alone courses focused on specific digital technologies, the embedding of digital components within disciplinary programmes, and non-formal or extra-curricular activities such as short courses, innovation challenges, and skills workshops. While these approaches can contribute to skills acquisition, the literature highlights persistent challenges related to fragmentation and limited integration into core curricula (OECD, 2018).

Entrepreneurship education is similarly characterised by diverse interpretations and delivery models. Academic research notes that entrepreneurship education has often been confined to business-related disciplines or elective modules, with limited penetration across broader fields of study (Gibb, 2011). Where entrepreneurship education is predominantly theoretical, its contribution to employability and innovation capacity may be constrained, particularly in contexts that require applied problem-solving and opportunity recognition skills.

Policy analyses further underline the difficulty of mainstreaming digital innovation and entrepreneurship within institutional structures. Reports at European and global levels identify constraints such as limited faculty capacity, insufficient incentives for interdisciplinary teaching, and the marginal positioning of innovation-related activities within academic governance and reward systems (European Commission, 2020; World Economic Forum, 2020). As a result, initiatives related to digital innovation and entrepreneurship in higher education often remain project-based or dependent on individual champions rather than being embedded within institutional strategies.

Overall, the literature suggests that while digital innovation and entrepreneurship are widely recognised as priorities for higher education reform, their systematic integration into teaching, learning, and institutional practice remains uneven. This reinforces the need for structured, capacity-oriented approaches that address both pedagogical and organisational dimensions within HEIs.

4.2. Pedagogical Approaches and Teaching Innovation

Pedagogical practice is a central factor shaping the extent to which higher education can support digital innovation and employability. The literature consistently indicates that traditional, lecture-based teaching remains the dominant mode of instruction in many HEIs, particularly within large undergraduate programmes. While such approaches are effective for knowledge transmission, they are widely regarded as insufficient for developing applied, transversal, and innovation-oriented competences.

In response, research increasingly emphasises the value of innovative pedagogical approaches, including experiential learning, project-based learning, problem-based learning, and collaborative teaching models. These approaches are associated with improved student engagement, enhanced skill development, and stronger links between theory and practice. Digital technologies are frequently cited as enablers of such pedagogical innovation, supporting blended learning, collaboration, and interaction with external stakeholders.

Despite growing recognition of their benefits, the adoption of innovative teaching practices remains uneven. The literature identifies several barriers to pedagogical change, including limited staff training in innovative methodologies, heavy teaching workloads, and assessment systems that prioritise content mastery over skills development. Institutional cultures and governance arrangements may further discourage experimentation, particularly where innovation in teaching is not recognised or rewarded.

Studies also point to the importance of organisational and systemic support for pedagogical innovation. Without structured professional development, access to appropriate digital tools, and institutional commitment, innovative teaching practices are difficult to sustain or scale. As a result, pedagogical innovation in higher education often remains localised and fragmented, reinforcing broader challenges related to employability and labour market alignment.

4.3. HEIs within Innovation Ecosystems

The role of Higher Education Institutions within broader innovation ecosystems has received increasing attention in academic and policy literature. Innovation ecosystems are commonly understood as networks of interconnected actors, including universities, industry, public institutions, and intermediary organisations, whose interactions shape knowledge creation, diffusion, and application (Etzkowitz & Leydesdorff, 2000). Within these systems, HEIs are positioned as key knowledge producers, human capital developers, and contributors to regional and national innovation capacity.

Despite this recognised role, the literature indicates that HEI engagement with innovation ecosystems is often uneven and insufficiently institutionalised. Studies highlight that collaboration with external actors frequently occurs through short-term projects, individual academic initiatives, or externally funded programmes, rather than through embedded institutional strategies (Perkmann et al., 2013). As a result, ecosystem engagement tends to remain peripheral to core teaching and learning functions.

Intermediary organisations, such as Digital Innovation Hubs (DIHs), are increasingly described in the literature as boundary-spanning actors that facilitate collaboration between HEIs, industry, and public sector stakeholders. These intermediaries support knowledge exchange, applied learning, and access to innovation infrastructure, particularly in contexts where direct HEI–industry collaboration is limited (OECD, 2021). However, evidence suggests that formal frameworks governing HEI–intermediary collaboration are often underdeveloped, limiting the sustainability and scalability of such interactions.

Across both European and African contexts, research points to structural and organisational barriers that constrain HEI participation in innovation ecosystems. These include unclear institutional mandates, fragmented internal structures, and limited incentives for academic staff to engage in externally oriented activities. Consequently, while innovation ecosystem participation is widely promoted in policy discourse, its translation into systematic institutional practice remains incomplete.

4.4. Institutional Capacity Constraints in Higher Education

Institutional capacity is widely recognised in the literature as a critical determinant of higher education systems' ability to respond to labour market and innovation challenges. Capacity constraints affecting HEIs are multidimensional, encompassing human resources, organisational structures, and infrastructure-related factors.

Human capacity limitations are frequently highlighted, particularly in relation to faculty preparedness for digital, entrepreneurial, and experiential teaching. Research indicates that many academic staff members have limited exposure to innovative pedagogical approaches and insufficient opportunities for continuous professional development in digital and innovation-related domains (European Commission, 2017). This constrains the effective integration of digital innovation and entrepreneurship into teaching and learning practices.

Organisational and governance-related constraints further shape institutional capacity. Studies point to rigid administrative procedures, fragmented responsibility for innovation-related activities, and limited coordination between academic departments and support units as factors that hinder institutional responsiveness (Teichler, 2007). In many cases, innovation, entrepreneurship, and external engagement are treated as supplementary activities rather than integral components of institutional missions.

Infrastructure constraints, particularly access to digital tools, laboratories, and reliable connectivity, are also widely documented, with pronounced disparities across regions. In African higher education contexts, these challenges are often exacerbated by resource limitations and uneven digital infrastructure development, reinforcing structural inequalities between institutions and regions (UNESCO, 2017).

Overall, the literature converges on the view that institutional capacity constraints are systemic rather than isolated. Addressing them requires coordinated approaches that combine human capacity development, organisational reform, and investment in enabling infrastructure.

4.5. Synthesis of Gaps and Unresolved Challenges

Synthesising the reviewed literature across policy, institutional, and ecosystem dimensions reveals a set of persistent and interrelated gaps affecting the capacity of HEIs to support digital innovation and labour market alignment. These gaps are evident across both European and African contexts, although their intensity and manifestations vary.

A first major gap concerns the limited integration of labour market and innovation ecosystem perspectives into core teaching and learning processes. While policy frameworks increasingly emphasise employability, digital skills, and entrepreneurship, these priorities are not consistently embedded within curricula, pedagogical practices, or institutional strategies.

A second gap relates to institutional capacity, particularly the availability of adequately trained academic staff, supportive governance structures, and enabling infrastructure. Without sustained investment in these areas, efforts to modernise higher education and strengthen ecosystem engagement remain fragmented and difficult to scale.

A third unresolved challenge concerns the institutionalisation of collaboration between HEIs and external innovation actors. Although intermediary organisations such as DIHs are widely recognised as valuable connectors, formal and sustainable collaboration frameworks remain underdeveloped in many contexts.

Taken together, these gaps underscore the structural nature of the challenges facing higher education systems in responding to digital innovation and labour market demands. Rather than reflecting isolated shortcomings, they point to the need for integrated, capacity-oriented approaches that address pedagogical, organisational, and ecosystem dimensions simultaneously. This synthesis provides a critical analytical foundation for understanding the relevance and positioning of subsequent UNIHUBS project activities.

4.6. Implications for the UNIHUBS Project

The analysis presented in this State of the Art report provides a structured understanding of the systemic and institutional conditions shaping the capacity of Higher Education Institutions to engage effectively with digital innovation and labour market demands. The reviewed literature consistently highlights that challenges related to skills relevance, pedagogical innovation, institutional capacity, and ecosystem engagement are interlinked and cannot be addressed through isolated or short-term interventions.

From an analytical perspective, these findings underline the relevance of project approaches that focus on capacity building rather than narrowly defined skill provision. In particular, the evidence points to the importance of strengthening institutional capabilities in areas such as innovative teaching methodologies, collaboration with external innovation actors, and the integration of digital and entrepreneurial competencies into mainstream educational practices. The literature further suggests that intermediary organisations can play a valuable role in facilitating collaboration and applied learning, especially where direct links between HEIs and industry remain limited.

Within this context, the UNIHUBS project is positioned as a response to documented gaps and challenges identified in existing knowledge and policy analyses. The State of the Art Analysis does not propose specific solutions; instead, it clarifies the structural rationale for initiatives that aim to enhance HEI–ecosystem collaboration, support experiential learning, and strengthen institutional capacity. Subsequent project activities and deliverables are designed to explore, operationalise, and test such approaches in line with the evidence base outlined in this report.

5. Conclusion

This State of the Art Analysis has examined the current body of academic literature and policy discourse related to digital innovation, entrepreneurship education, and labour market alignment in higher education across European and African contexts. The review demonstrates that despite strong policy emphasis on employability, digital transformation, and innovation-led growth, higher education systems continue to face structural challenges that limit their responsiveness to evolving labour market needs.

The analysis highlights persistent skills mismatches, slow curriculum adaptation, uneven adoption of innovative pedagogies, and constrained institutional engagement with innovation ecosystems. These challenges are shown to be systemic in nature, shaped by governance structures, capacity constraints, and broader ecosystem dynamics rather than by isolated institutional shortcomings.

By synthesising existing knowledge and identifying unresolved challenges, this report establishes a robust analytical baseline for the UNIHUBS project. It provides the conceptual and contextual foundation necessary for interpreting subsequent project activities, including the identification of best practices, the assessment of partner needs, and the design and piloting of capacity-building interventions. In doing so, the State of the Art Analysis contributes to ensuring that UNIHUBS activities are grounded in evidence, aligned with policy priorities, and responsive to the structural realities of higher education systems in Europe and Africa.

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