UNIHUBS

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# 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

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## Partners

University of Macedonia · KUMASI TECHNICAL UNIVERSITY · UNIVERSITY OF NAIROBI · hapaSpace · STIMMULI for social change · KNUST Kwame Nkrumah University of Science and Technology · Erasmus University Rotterdam · MUST 2012

# Collection of Best Practices - D2.2

## Document History

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# 1. Executive summary

This analysis was conducted to identify best practices for enhancing the capacity of higher education institutions (HEIs) in both Europe and Africa to address the unmet labour market needs in digital innovation and entrepreneurial skills. As the global economy becomes increasingly digital, HEIs must adapt their curricula, teaching methods, and industry collaborations to equip graduates with the skills necessary for success in modern job markets. This study examines successful capacity-building programs across various HEIs and offers actionable insights and recommendations for HEIs to better prepare their students for these evolving demands.

### Main Insights and Best Practices

The analysis reveals several effective strategies that HEIs are using to bridge the gap between academic training and labour market needs. Key insights include:

**Entrepreneurship-Driven Curricula**: Programs like Ashesi University's entrepreneurship model embed practical business skills and innovation into the curriculum, preparing students to think entrepreneurially and respond to real-world challenges.

**Industry Collaboration:** Strong partnerships between academia and industry, as seen in ACCESS and CARISCA, provide students with hands-on experience, mentorship, and job opportunities, aligning education more closely with market requirements.

**Blended Learning and Digital Platforms**: Programs like dLab and DSI-Africa effectively use online platforms and blended learning models to make education more accessible, especially in remote areas, enhancing students' digital competencies.

**Interdisciplinary Learning:** Models such as INNOTAL's Talent Co-Creation Labs encourage students from different fields to work together on industry-relevant projects, fostering a well-rounded skill set and collaborative problem-solving abilities.

# Key Recommendations

Based on the analysis, the following recommendations are proposed for HEIs, policymakers, and industry partners:

1. **Integrate Entrepreneurship into Core Curricula:**

HEIs should consider embedding entrepreneurial training across all disciplines, as Ashesi University has done, to foster innovation and job creation.

2. **Enhance Industry-Academia Partnerships:**

Establish and strengthen partnerships with industry to co-create programs, provide internships and offer mentorships that give students practical exposure, following models like ACCESS and CARISCA.

3. **Adopt Blended Learning Models:**

Invest in digital infrastructure and online learning platforms to support hybrid education, enabling flexible and accessible learning opportunities, as dLab exemplifies.

4. **Encourage Interdisciplinary Collaboration:**

Develop programs that bring together students from diverse backgrounds to work on real-world projects, as seen in INNOTAL, to foster versatile, market-relevant skills.

5. **Promote Faculty Development:**

Offer continuous professional development for educators, equipping them with updated skills and teaching methodologies to deliver industry-aligned and digital-focused education, similar to SASBI's approach.

These recommendations provide a framework for HEIs to enhance their capacity and better address the digital and entrepreneurial skill gaps in the labour market, supporting economic growth and fostering innovation across Africa and Europe.

# 2. Introduction

In today's increasingly digitized global economy, the demand for digital innovation and entrepreneurial skills has grown significantly, making them critical competencies for workforce readiness and economic resilience. The importance of digital innovation and entrepreneurial skills has grown substantially, as these competencies are increasingly viewed as fundamental in equipping workers for a rapidly transforming job market (Work Economic Forum, 2020). According to recent insights, demand for critical digital skills, such as analytical thinking, technology design, and programming, is expected to surge, with over 40% of employers highlighting analytical thinking and complex problem-solving as top priorities for future-ready skill sets. Additionally, it is highlighted (Work Economic Forum, 2020) that self-management skills, including resilience, stress tolerance, and active learning, are now as crucial as technical abilities for adaptation in dynamic work environments.

In this line, the European Union's (2020) Digital Education Action Plan (2021-2027) emphasizes the need for digital education systems that are high-quality, inclusive, and adaptable to the demands of the digital age. The COVID-19 pandemic underscored this urgency, highlighting inequalities in access to digital resources and the importance of digital skills (Vlachopoulos, 2020). This action plan aims to foster resilience and skill-building through structured digital ecosystems and a focus on digital literacy, ultimately bridging gaps in education and empowering learners and educators across the EU (European Union, 2020). The pandemic accelerated digital transformation, intensifying the need for digital and entrepreneurial skills across all sectors. McKinsey's Future of Work report (Lund et al., 2021) highlights how Higher Education Institutions (HEIs) can play a critical role in closing these skill gaps by adapting curricula to include targeted digital competencies and entrepreneurship. By fostering these capabilities, HEIs enable students to meet evolving job market demands, thus supporting both individual career growth and broader economic resilience.

imilarly, the INFUSSE project develops digital entrepreneurship skills by offering specialized training paths that cover digital tools for venture creation, innovation-driven business models, and ICT skills, promoting youth-led entrepreneurship and resilience. The African German Entrepreneurship Academy (AGEA) promotes hands-on entrepreneurship education and the establishment of entrepreneurship centers within African universities. AGEA supports university-business linkages and emphasizes skills in entrepreneurial thinking, business incubation, and university-based startup support. By fostering direct collaboration between HEIs and SMEs, AGEA aims to bridge the gap between academia and industry, helping students gain practical experience in developing and scaling businesses. INNOTAL project integrates talent development into innovation ecosystems in higher education, focusing on entrepreneurship education and employability skills.

The INNOTAL curriculum includes Talent Labs where students collaborate on real-world projects with external stakeholders. Modules in innovation management, social entrepreneurship, and digital project management equip students with practical skills aligned with labor market demands. Additionally, an online innovation platform connects students with faculty and industry mentors, encouraging collaborative idea generation and project development. Similarly, SFFACCEL (Start For Future Acceleration) initiative spans 30 European countries, developing regional innovation hubs focused on deep tech and smart specialization. SFFACCEL offers a fully online program that covers startup development, team management, prototyping, and ecosystem engagement. The program's three pathways—Learn, Match & Start, and Develop & Co-creation—are designed to guide students, graduates, and startups from ideation to prototype validation, with support from industry experts and business mentors. This initiative aligns with the New European Innovation Agenda, advancing digital entrepreneurship and open innovation practices across European regions. The types of programs analyzed cover various delivery modes (online, hybrid, and face-to-face) and formats. Programs include structured curriculums with modules on skills like digital tools for innovation, entrepreneurial mindset development, and project-based learning. These initiatives integrate experiential learning, digital incubation, industry collaboration, and mentorship, as seen in programs like INFUSSE, which uses ICT skills to enhance entrepreneurship, and CARISCA, which focuses on practical supply chain management for health and agriculture.

# 3. Methodology

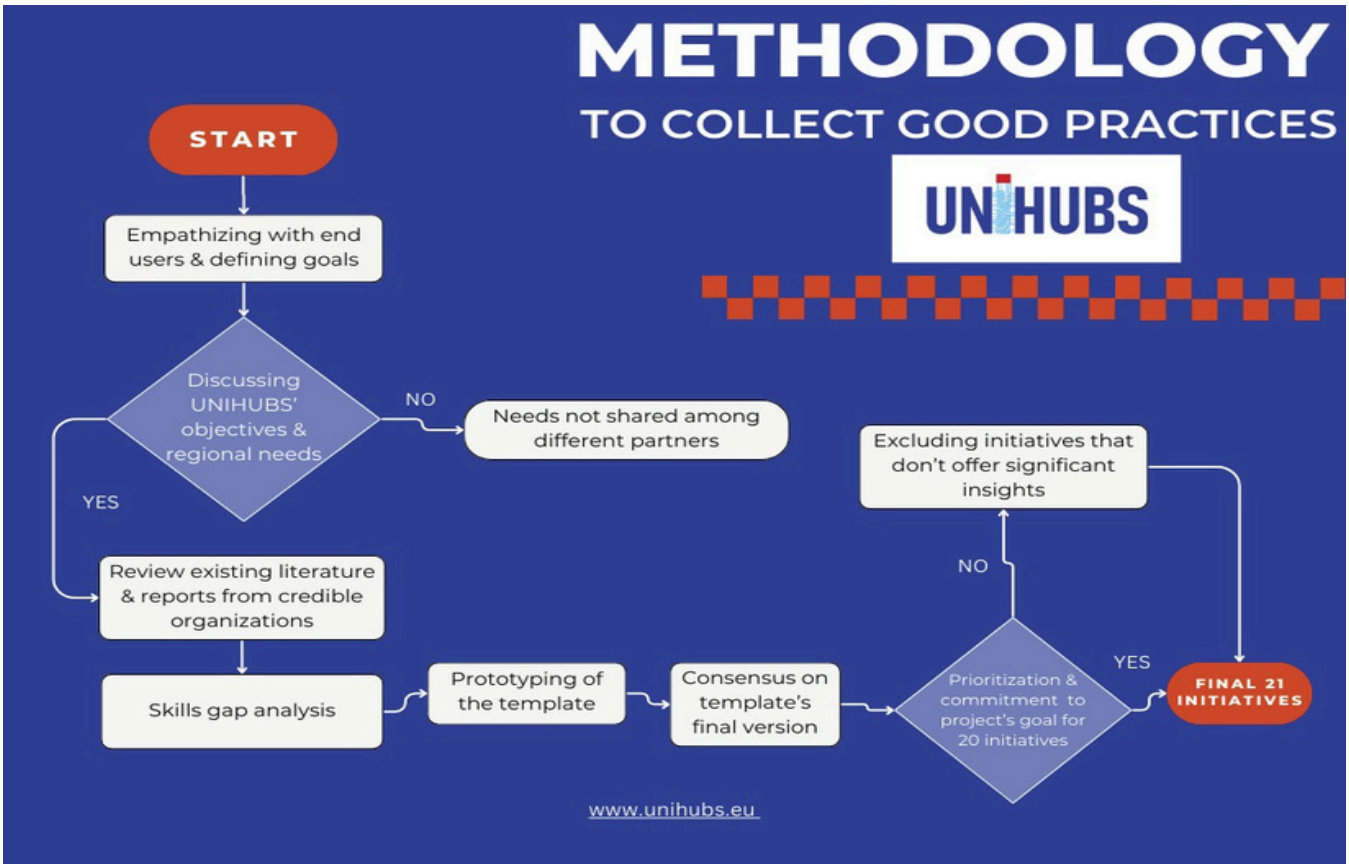
The process for collecting information on best practices in capacity-building programs for Higher Education Institutions (HEIs) and other similar initiatives was led by Hapa Space and Rotterdam School of Management (RSM), in collaboration with all UNIHUBS partners.The co-creation process for developing the data collection methodology followed the principles of design thinking, and it was structured across three iterative sessions. This method allowed for creative,user-centered exploration of best practices, ensuring the final output met the diverse needs of the UNIHUBS partners. In the initial session, partners focused on empathizing with regional needs and establishing clear goals for the project. Drawing on design-thinking principles, this session invited each partner to share specific insights into the unique challenges and opportunities in their regions. By sharing initial ideas on digital innovation and entrepreneurship in education, partners contributed to a collective understanding of common goals and constraints. This stage helped define the primary objectives of the data collection process, with a focus on inclusivity and relevance to both African and European educational landscapes.

The second session centered on ideation—brainstorming metrics and indicators that could effectively measure program success across different contexts. Partners collaboratively explored diverse regional needs, discussing skills gaps, industry linkages, and student outcomes essential to building digital and entrepreneurial capacities. Metrics such as employability rates, skill acquisition levels, and student engagement rates were proposed, with partners testing ideas to ensure applicability across regions. This ideation phase allowed partners to experiment with possible frameworks, ultimately narrowing down metrics that would support meaningful, comparative analysis of capacity-building programs.

In the final session, partners engaged in prototyping by refining and testing the data collection template (Appendix 1). This stage involved designing structured fields within the template to capture general program details, curriculum content, skills developed, success metrics, and policy recommendations. Partners reviewed, adapted, and provided feedback on the template, ensuring it was comprehensive yet flexible for various program types. Through this iterative process, the group validated the template as a practical tool for systematically documenting best practices, ready for use across all UNIHUBS partner institutions. The finalized template, validated through multiple iterations, provided a standardized approach for collecting and analyzing data on Erasmus+ Capacity-Building Programs and similar initiatives across diverse educational contexts. Each UNIHUBS partner then applied this template, ensuring comprehensive documentation of best practices for digital innovation and entrepreneurship education. Specifically, partners drew upon various sources to identify relevant initiatives. They began by examining projects they had previously participated in or developed within their institutions, leveraging firsthand knowledge of effective methodologies and outcomes. Additionally, they tapped into their professional networks, consulting industry and academic contacts to gather insights into recent capacity-building innovations. To broaden the scope, partners explored established databases, such as the Erasmus+ Project Results Platform, which hosts a wealth of EU-funded educational initiatives, including those focused on skills development and entrepreneurship. They also consulted Google Scholar to identify articles that refer to Capacity Building programs in higher education. This structured approach yielded a cohesive data set that allowed for meaningful comparative analysis, highlighting effective strategies and innovative practices that could be adapted to varying geographic and institutional contexts. The result was a robust, evidence-based repository of best practices in digital innovation and entrepreneurship education across European and African regions. The primary focus was on capacity-building Erasmus+ programs, which align well with UNIHUBS' objectives in digital innovation and entrepreneurship. However, the selection process also included Horizon-funded programs and other key initiatives with similar aims, offering valuable insights and complementary methodologies. To provide tangible results and practical guidance, partners prioritized finalized projects—those with measurable outcomes and case studies that can serve as realistic examples for comparison. At the same time, recent projects with innovative teaching methods or curriculum designs were sought to incorporate fresh perspectives and innovative methodologies. Geographic relevance was another factor; the team prioritized initiatives where UNIHUBS member countries were involved or those that had demonstrated impact in similar European and African contexts. Additionally, the duration of the selected projects was considered, focusing on those whose timelines were comparable to that of UNIHUBS to allow for practical implementation comparisons.

Following the commitments made in the UNIHUBS project proposal, the partners aimed to identify 20 initiatives that best aligned with the UNIHUBS project scope. This required careful prioritization to ensure the selected programs offered significant insights into enhancing digital innovation and entrepreneurial capacity in Higher Education Institutions. Following a thorough review, partners presented and discussed the shortlisted initiatives in an online consortium meeting. During this session, each initiative was evaluated for its relevance and potential impact, leading to a consensus on the final list of 21 initiatives. The templates documenting the details for each of these initiatives, covering their objectives, methods, and outcomes, are compiled in Appendix 2. This collection serves as a valuable resource for understanding and replicating successful capacity-building strategies across diverse educational and regional contexts. The flowchart below illustrates the key phases of the process for collecting Erasmus+ capacity-building programs and similar initiatives to support the goals and needs analysis of the UNIHUBS project.

Picture 1. Flowchart of the process for collecting relevant initiatives



# 4. General Overview of the Programs

## Summary of programs:

The following table provides an overview of key initiatives aimed at strengthening the capacity of higher education institutions (HEIs) in Africa and Europe to meet digital labour market needs and foster entrepreneurship. Each program's focus is unique, yet they collectively work towards equipping students, faculty, and supporting institutions with critical skills, industry connections, and innovative methodologies. The table includes details on program names, involved countries, target audiences, duration, and delivery modes, offering a snapshot of these impactful capacity-building efforts.

| Program Name | Countries Involved | Target Audience | Duration |
|---|---|---|---|
| AEDIB\|NET | Kenya, Rwanda, Cote d'Ivoire, Tunisia, Cameroon, Egypt, South Africa, Germany, France, Morocco, Senegal, Tanzania, Uganda | African tech innovators, supporting institutions | February 2021 - April 2024 |
| AfriLabs Capacity Building Programme (ACBP) | 53 African countries | African innovation hubs, | 2011 - 2024 |
| Mobilising Regional Capacity Initiative (MRCI) | Uganda, Tanzania, South Sudan, Rwanda, Kenya, Burundi | entrepreneurs, HEIs, students, faculty, policymakers, community stakeholders | 2007 - 2011 |
| Africa Higher Education Centres of Excellence (ACE) | West and East African nations | Postgraduate students in STEM, agriculture, health, education | 2014 - 2024 |

| | | | |
|---|---|---|---|
| African Centre for Career Enhancement & Skills Support (ACCESS) | Germany, Benin, Ghana, Kenya, Nigeria, Rwanda, Tunisia | African university students, HEIs, faculty, private sec tor | 2020 - 2024 (possible extension) |
| Tanzania Data Lab (dLab) | Tanzania | Students, lecturers, young innovators | Launched in 2016, ongoing |
| Innoversity Africa | Tanzania, France | University students | 2 years |
| AHEAD | Italy, Kenya, Uganda, Romania, Tanzania, Poland, Bulgaria | HEIs sta and students | 3 years (extended due to COVID-19) |
| CARISCA | Ghana, USA | Researchers, academics, students in supply chain management | 2020 - 2025 |
| INNOTAL | Bulgaria, Greece, Philippines, Finland, UK, Sri Lanka, Nepal, India | University students, faculty, administrators, policymakers | October 2017 - October 2021 |
| ASEAN Network for Green Entrepreneurship and Leadership (ANGEL | Cambodia, Cyprus, Greece, Indonesia, Laos, Malaysia, Vietnam | University students, early-stage green entrepreneurs, academic sta | January 2021 - July 2024 |
| African German Entrepreneurship Academy (AGEA) | Germany, Ghana, R wanda | SMEs, HEIs, academic and | 2017 - 2020 and beyond |

| | | | | |
|---|---|---|---|---|
| Swiss African Science and Business Innovators (SASBI) | Ghana, Kenya, South Africa, Nigeria, Rwanda, Cote D'Ivoire | management professionals University innovation o ces, tech transfer o ces, hubs, star t-ups | 2021 - 2024 | Online & Face-to-face |
| INFUSSE | Greece, Poland, Romania | Students, university staff, innovation managers | February 2022 - January 2024 | Online |
| SFFACCEL | 30 European countries | Students, graduates, startups, industry, investors | May 2023 - December 2024 | Online |
| AFRETEC Network | US, Kenya, South Africa, Nigeria, Egypt, Rwanda | Students | 2022 - ongoing | Hybrid |
| DSI-Africa | USA and African nations | Researchers, innovators in health data science | Five years | Hybrid |

## Comparative Analysis of Higher Education Capacity-Building Programs

To understand how various programs support higher education institutions (HEIs) in Africa and Europe, this analysis compares 17 key initiatives focused on enhancing digital and entrepreneurial skills. These programs differ in their approach, scope, target audiences, and delivery modes, yet share a commitment to fostering innovation, employability, and capacity building. By examining each program's unique contributions and methodologies, we gain insights into how diverse strategies are deployed to address the evolving demands of the digital and entrepreneurial landscape in higher education.

### 1. Geographical Reach and Focus:

Many programs, such as ACE, ACCESS, and CARISCA, focus primarily on African nations, reflecting their mission to build regional capabilities. Others, like SFFACCEL and ANGEL, are broader, covering European, ASEAN, and African countries, often with a regional specialisation in areas like green entrepreneurship or deep tech.

### 2. Target Audience Diversity:

Programs differ in their target groups, with some aimed at a broad audience of university students, faculty, and innovators (e.g., AEDIB|NET, AfriLabs), while others are more specialised. For instance, CARISCA specifically targets supply chain professionals, and **DSI-Africa** focuses on health data scientists. This variation indicates tailored approaches to meet specific skill gaps across industries.

### 3. Program Duration and Sustainability:

The longer-term programs, like ACE and AfriLabs, have established a sustained impact over a decade, helping institutions to build lasting capacity and regional impact. Shorter, focused programs such as Innoversity Africa and INNOTAL have distinct objectives and are often positioned as pilot projects, possibly for future expansion or replication based on initial success.

### 4. Delivery Modes and Accessibility:

A mix of online, face-to-face, and hybrid delivery modes ensures that programs cater to different accessibility needs. Programs like AFRETEC and DSI-Africa leverage hybrid approaches to reach broader audiences, especially in remote areas. On the other hand, initiatives like INFUSSE rely exclusively on online delivery, reflecting a digital-first approach, ideal for remote learning.

### 5. Curriculum Design and Industry Engagement:

Programs like ACE and AFRETEC stand out for their industry-relevant curricula, ensuring alignment with labour market needs by involving industry leaders in course design and offering internships. In contrast, programs like INNOTAL and AHEAD use experiential learning approaches, encouraging students to collaborate with industry partners on real-world projects, thereby building practical skills.

### 6. Sectoral Specialisation:

Some programs focus on specific sectors—CARISCA targets supply chains, DSI-Africa centres on health, and ANGEL focuses on green entrepreneurship. This sectoral specialisation enables these programs to address niche skill gaps and fosters the development of industry-relevant expertise in specific fields.

### 7. Innovation and Entrepreneurial Emphasis:

Entrepreneurship is a common theme, especially in programs like AGEA and Innoversity Africa, which incorporate startup incubation, mentorship, and access to funding. This emphasis supports students and faculty in pursuing new business ventures, bridging academic knowledge with practical applications and potentially contributing to local economies.

## 5. Program descriptions and findings

The table below provides a concise overview of the primary programs examined in this report, all dedicated to building capacity within higher education institutions (HEIs) to address evolving digital and entrepreneurial workforce demands across Africa and Europe. Each program entry details the key skills and competencies fostered, along with the metrics used to measure success. This side-by-side comparison underscores the varied methodologies and focus areas of these initiatives, showcasing their collective impact on enhancing skills, employability, and innovation in HEIs.

| **Program Name** | **Skills and Competencies Covered** | **Success Metrics** |
|---|---|---|
| AEDIB | NET (African European Digital Innovation Bridge Network) | Digital technology adoption, entrepreneurial capacity, investment readiness, ecosystem building, sustainable business practices |
| AfriLabs Capacity Building Programme (ACBP) | Hub management, financial planning, community engagement, incubation, acceleration, investment readiness, innovation | Network expansion across 53 African countries, community engagement, improved hub operational capacity |
| Mobilising Regional Capacity Initiative (MRCI) | Information sharing, innovation, teaching quality improvement, policy development, community engagement | Enhanced institutional capacity, increased enrollment rates, quality of education improvements, partnership development |
| Africa Higher Education Centres of Excellence (ACE) Project | Research methodologies, technical proficiency, public health, sustainable agriculture, policy analysis | Number of students trained, research outputs, partnerships, governance improvements in participating centres |
| African Centre for Career Enhancement & Skills Support (ACCESS) | Digital skills, critical thinking, problem-solving, entrepreneurship, industry collaboration, networking | Increased employability rates, training impact on faculty, partnership development, student engagement |

| | | |
|---|---|---|
| Tanzania Data Lab (dLab | Data science, machine learning, data visualization, coding, innovation | Number of startups and jobs created, impact on gender inclusion programs like 'Code Like a Girl' |
| Innoversity Africa | Entrepreneurship, research commercialization, investor readiness, networking | Number of startups established, lecturers trained, partnerships created, investment raised |
| AHEAD Project | Community engagement, grassroots innovation, entrepreneurship, inclusive innovation | Establishment of innovation hubs, student participation in innovation competitions, publications produced |
| CARISCA | Supply chain management, logistics, research methodologies, gender-inclusive practices | Research outputs, student training numbers, stakeholder engagement in supply chain summits, women's inclusion initiatives |
| INNOTAL | Entrepreneurship, innovation management, project management, collaboration, social entrepreneurship | Creation of Talent Co-Creation Labs, participant numbers in collaborative activities, platform engagement for idea generation |
| ANGEL | Green entrepreneurship, transformational leadership, cultural and linguistic adaptability, sustainable business practices | Engagement in green entrepreneurship, cross-border collaboration and knowledge-sharing, policy recommendations for sustainability |
| | | |
| AGEA | Entrepreneurship, graduate employability, university-business link ages | Establishment of entrepreneurship centres, support for university-business linkages, graduate career outcomes |
| SASBI | Business planning, digital skills, ICT, technology innovation, entrepreneurship | Number of students and educator scompleting onlinecourses, e ectiveness of digital entrepreneurial education programs |

| | | |
|---|---|---|
| SFFACCE L | Digital entrepreneurship, idea validation, customer validation, ecosystem development | Participation in incubation programs, startups receiving funding, progress through incubation milestones |
| AFRETEC Network | ICT, active learning, experiential learning, industry-relevant skills | Number of ICT workshops, development of short courses, integration of technology in curricula |
| DSI-Africa | Data science, bioinformatics, machine learning, ethical data management | Number of data science professionals trained, research outputs in health data science, establishment of interdisciplinary networks |

A closer look at the skills and success metrics reveals that many programs effectively align targeted skills with specific, measurable outcomes to address the demands of today's labour markets and innovation ecosystems. For example, CARISCA focuses on developing supply chain management skills, especially for roles that support gender-inclusive practices. This program measures success through outputs like research publications, stakeholder engagement in supply chain events, and training a significant number of students. By honing in on a sector-specific skill set, CARISCA not only increases employability but also fosters a specialised workforce aligned with industry needs in Africa.

Similarly, ACCESS builds digital and entrepreneurial competencies, critical thinking, and problem-solving abilities. This program gauges success by tracking employability rates and partnership developments, ensuring that the skills cultivated have a tangible impact on graduates' career outcomes and the broader job market. This targeted approach enhances the practical value of education within HEIs, transforming academic achievements into economic opportunities.

The Tanzania Data Lab (dLab) program prioritises advanced data science skills, machine learning, and coding, skills highly sought after in tech-driven industries. Success metrics here include the number of startups and jobs created, with a particular focus on gender inclusion through initiatives like "Code Like a Girl." This combination of high-demand skills and specific metrics fosters both innovation and inclusion, directly addressing market needs.

In the AHEAD project, the focus extends to community engagement and grassroots innovation, aiming to empower students and faculty to contribute to inclusive innovation practices. Success is measured through the establishment of innovation hubs and student engagement in competitions, showcasing the program's broader impact on creating an inclusive culture of innovation within HEIs.
These examples highlight how each program's choice of skills and success metrics reflects an intent to bridge academic outcomes with practical, market-driven results. By measuring both quantitative outputs and qualitative impacts, these programs ensure a holistic view of success, reinforcing the importance of long-term sustainable development in highereducation and regional innovation ecosystems.

## 6. Best Practices for Capacity Building

The programs analysed reveal a range of best practices for capacity building in higher education institutions (HEIs) focused on digital skills, entrepreneurship, and innovation. Each program employs specific strategies to enhance teaching, align curricula with industry needs, engage with professional networks, and leverage technology. The following sections provide insights into the most effective methods observed across these programs, highlighting how they contribute to building sustainable capacity within HEIs.

### Teaching Methods

Many programs incorporate innovative teaching methods to ensure students acquire practical, transferable skills relevant to the job market. For example, the CARISCA program uses case-based learning and simulation exercises specifically in supply chain management. Students engage with real-world cases, allowing them to apply theoretical knowledge to situations they will encounter professionally. This hands-on approach is highly effective for fields requiring critical thinking and decision-making skills. Similarly, Innoversity Africa integrates action learning projects, where students are tasked with solving actual business problems for local startups. This approach enhances learning by embedding students within real business environments, fostering problem-solving abilities and resilience. Additionally, DSI-Africa incorporates peer-learning modules in health data science, enabling students to share knowledge, discuss challenges, and learn collaboratively, creating a supportive learning environment that also builds teamwork skills. The AGEA program, focused on entrepreneurship, uses live case studies from local businesses. Students engage directly with entrepreneurs, studying ongoing business challenges and proposing solutions. This approach provides a continuous learning loop, as students witness the practical impact of their recommendations in real-time.

### Curriculum Design

Successful programs carefully design their curricula to align closely with the competencies required in relevant industries. ACCESS incorporates an industry-driven curriculum by constantly consulting with private sector stakeholders to ensure alignment with current market trends. This program includes modules on digital skills, critical thinking, and entrepreneurship to prepare graduates for roles that demand adaptability and cross-functional expertise.

The ASEAN Network for Green Entrepreneurship and Leadership (ANGEL) curriculum is designed to address the needs of the green economy by integrating sustainability principles and environmental responsibility into entrepreneurship training. This innovative curriculum is vital for preparing students to enter and contribute to sectors focused on green technology and sustainable business practices.

The ACE program, targeted at postgraduate students in STEM, health, agriculture, and education, combines advanced technical skills with research methodologies. The curriculum incorporates modules that tackle both theoretical and practical components, preparing students for research-intensive roles. This curriculum model is particularly effective for fields requiring both domain expertise and applied research skills.

## Industry Engagement

Engaging industry partners is a core strategy for these programs to provide students with real-world experience and networking opportunities. The AFRETEC Network excels in fostering partnerships with ICT firms to offer internships and work placements. By integrating these opportunities into the curriculum, students gain hands-on experience in relevant industries, bridging the gap between academic learning and professional application. SASBI establishes connections between university innovation offices and tech transfer offices to encourage collaboration on projects. This engagement allows students to work on cutting-edge innovations, with access to resources and mentorship from both academic and industry mentors. This dual guidance model offers students' insights into the technical aspects of innovation and its commercialisation process, preparing them to transition innovations from research to market. In the Tanzania Data Lab (dLab) program, industry engagement goes beyond internships; dLab invites data scientists and tech experts from the industry to co-lead workshops and seminars, providing students with up-to-date knowledge and insights into industry trends. These engagements enable students to network with professionals and learn about emerging technologies directly from practitioners.

## Use of Technology

Technology is leveraged across programs to enhance accessibility, engagement, and interactivity, especially in remote and underserved areas. DSI-Africa uses a comprehensive learning management system (LMS) that allows students from across Africa to access courses in data science and health innovation. This LMS supports multimedia learning, including video lectures, interactive quizzes, and discussion forums, fostering an engaging online learning environment. The INFUSSE program, which focuses on digital entrepreneurial skills, utilises digital tools for business simulations that enable students to practice entrepreneurial decision-making in a virtual environment. This tool is essential for developing critical thinking and risk management skills, providing a safe space for students to test strategies and see the outcomes of their decisions in real-time simulations. SFFACCEL further enhances its program by using virtual incubation platforms, where students and startups work through stages of idea validation, customer engagement, and market entry. These platforms provide an environment where participants receive structured guidance and feedback from mentors, often industry professionals, facilitating the growth of viable business ideas. The Innoversity Africa program employs remote mentorship platforms to connect students with mentors globally. This use of technology allows students to receive guidance and feedback regardless of geographical barriers, expanding their access to knowledge and expertise. Additionally, virtual collaboration tools are integrated into team projects, enabling students to work seamlessly with peers and mentors worldwide.

## Summary

This in-depth analysis highlights how diverse approaches are implemented across these programs to build practical skills and align educational outcomes with industry needs: Teaching methods emphasising real-world application, like project-based learning and internships, ensure that students are job-ready and able to handle professional challenges.

Curriculum design that aligns with industry trends, such as green entrepreneurship and advanced STEM skills, ensures students acquire competencies directly applicable to current labour market demands.

Industry engagement through mentorship, internships, and collaborative projects provides students with a valuable network and insights into professional environments.

The use of technology through LMS platforms, digital simulations, and remote mentorship extends access to quality education, fostering inclusive and flexible learning experiences. These best practices collectively contribute to building HEIs' capacity to produce graduates with the skills, knowledge, and adaptability needed to thrive in rapidly evolving digital and entrepreneurial fields.

## 7. Policy recommendations

To enhance the effectiveness of capacity-building programs, targeted policy recommendations are essential for helping HEIs align more closely with labour market needs, strengthen industry partnerships, adopt innovative teaching methods, and receive regulatory support. These recommendations aim to provide actionable strategies for HEIs, industry stakeholders, and policymakers to work together in equipping students with digital and entrepreneurial skills, fostering a more adaptable and skilled workforce. The following suggestions outline practical steps HEIs can take to build stronger, industry-relevant programs that address both immediate and future market demands.

### 1. Enhancing Curricula to Address Labour Market Needs

Practical Example in Africa: Ashesi University in Ghana is a prime example of an institution embedding entrepreneurship directly into its curriculum. Through its Foundations of Design and Entrepreneurship course, all students are required to conceptualise, design, and test a business idea, fostering entrepreneurial skills early. This model equips students with practical skills in business ideation, digital literacy, and innovation, relevant to local and global markets. Comparative Approach in Europe: European universities like Aalto University in Finland have integrated multidisciplinary modules that blend technology, design, and business. The Design Factory at Aalto provides a collaborative space where engineering, business, and design students work together on industry-sponsored projects, learning practical skills while solving real-world problems. Mutual Learning:

African HEIs can benefit from structured industry partnerships, as seen at Aalto University, to give students access to cutting-edge projects and mentorship.

European HEIs could look to models like Ashesi's, which emphasises mandatory entrepreneurship skills for all students, encouraging them to create ventures that directly address local needs.

### 2. Strengthening Academia-Industry Partnerships

Practical Example in Africa: Programs like ACCESS in Ghana collaborate closely with local companies to co-create curricula and provide students with on-the-ground internships. ACCESS tailors its offerings to match market demands, emphasising digital skills, critical thinking, and practical problem-solving aligned with private-sector needs. Students gain hands-on experience through internships, boosting employability.

Comparative Approach in Europe:

The University of Cambridge works with industries across sectors to integrate internships, mentorships, and project-based learning into its STEM programs. Cambridge's Impact Acceleration Programme enables industry-led workshops where students work on real challenges, bridging the gap between academia and the professional world.

Mutual Learning:

African universities could adopt Cambridge's model of focused industry workshops and co-branded programs that create stronger bonds between industry and academia. European institutions can look to ACCESS for insights on how to create curricula closely tied to national development goals, aligning with local industry needs and fostering job-ready skills for emerging economies.

## 3. Adopting Innovative Pedagogical Approaches

Practical Example in Africa: INNOTAL in Sri Lanka and Nepal has been adopted in African universities to incorporate experiential learning through Talent Co-Creation Labs. In these labs, students collaborate on innovation projects, often in partnership with local businesses. This hands-on approach helps students develop creative problem-solving skills, resilience, and adaptability in a supportive learning environment. Comparative Approach in Europe: ESADE Business School in Spain employs blended learning with gamified simulations in its entrepreneurship programs. Students navigate real-world business scenarios, making decisions and observing simulated outcomes in a controlled setting, which cultivates critical thinking and analytical skills essential for entrepreneurs. Mutual Learning: African HEIs could explore gamification techniques like those used at ESADE to make learning interactive and to replicate real-world business challenges in a low-risk environment. European HEIs could benefit from the Co-Creation Lab model by involving students more deeply with local businesses, fostering a sense of social responsibility and direct engagement with community challenges.

## 4. Regulatory Improvements to Support HEIs in Skill

Development Practical Example in Africa: In Ghana, government support for entrepreneurial training has been key in helping universities such as the University of Ghana develop partnerships with local and international companies. Regulatory policies encouraging collaborations provide financial support and incentives for private-sector involvement in education, bolstering skill development in alignment with national development goals. Comparative Approach in Europe: The European Commission's Erasmus+ Programme supports partnerships between universities and industry across the EU. Through this programme, European HEIs gain funding and regulatory support to integrate innovative curricula, conduct student exchanges, and offer internships that align academic learning with the labour market.

Mutual Learning: African HEIs could push for regulatory frameworks like Erasmus+, which incentivises joint projects and student mobility across industries and countries. European institutions could learn from Ghana's approach of aligning HEI programs with national goals for economic development, integrating more place-based skills development to ensure that students can impact their immediate environments.

## Summary of Practical Takeaways for HEIs:

For African HEIs: Incorporate gamified simulations, structured industry-led workshops, and leverage cross-disciplinary labs, drawing on European models to enhance student learning through real-world applications. For European HEIs: Learn from African universities like Ashesi, which requires all students to undertake entrepreneurial projects, encouraging innovative, problem-solving mindsets and local economic impact. For Policymakers: Foster policy frameworks that encourage private sector collaboration, aligning HEI programs with national development strategies, and enabling sustainable industry partnerships to enrich curricula. By adopting these best practices, HEIs across Africa and Europe can better prepare graduates for the global economy while also addressing local economic and social needs through collaborative, practical, and innovative approaches to learning.

# 8. Challenges and limitations

Implementing capacity-building programs in higher education institutions (HEIs) comes with a range of challenges that can limit their effectiveness and sustainability. From securing consistent funding to navigating policy restrictions and ensuring adequate industry engagement, these obstacles affect the reach and impact of these initiatives. Below is an overview of the most common challenges faced in implementing these programs, along with some limitations encountered in this study's analysis. Understanding these hurdles is essential for refining strategies that make capacity-building efforts more resilient and impactful.

1. Funding Constraints A major challenge in implementing capacity-building programs is securing sustainable funding. Many programs, especially in African HEIs, rely heavily on grants or temporary funding, which can limit long-term impact. For instance, programs like ACCESS and MRCI in Africa depend on donor funding, which may not cover all operational costs and often restricts expansion. Limited funding can also affect infrastructure, preventing HEIs from investing in advanced technology and resources crucial for digital and entrepreneurial training.

2. Lack of Consistent Industry Involvement While industry partnerships are integral to building relevant skills, establishing and maintaining these collaborations can be difficult. Many African HEIs face challenges in attracting industry partners due to limited private sector incentives and regulatory support. Without consistent industry engagement, programs may struggle to offer internships, mentorships, or real-world projects. For example, programs like Innoversity Africa and dLab encounter varying levels of industry support, impacting their ability to provide hands-on experiences.

### 3. Policy Constraints

In some countries, outdated regulatory frameworks limit HEIs' ability to innovate within curricula or form flexible partnerships with industry. Strict accreditation standards and limited government support for private-sector collaboration can hinder the adoption of new, responsive curricula. Unlike European programs supported by flexible frameworks like Erasmus+, many African programs must navigate restrictive policies that don't adapt to the needs of digital or entrepreneurial skill-building.

### 4. Infrastructure and Technological Limitations

Access to reliable digital infrastructure is essential for programs that rely on online or blended learning. However, in many regions of Africa, internet access and digital resources remain limited, especially outside urban areas. Programs like DSI-Africa and AFRETEC Networks face challenges in reaching students in remote areas where online platforms and digital tools are not always accessible. This disparity creates barriers to equitable learning and limits the reach of digital skill-building programs.

### 5. Cultural and Pedagogical Resistance

In both African and European contexts, there can be cultural resistance to new pedagogical approaches, such as gamification or project-based learning. Faculty and administrators accustomed to traditional lecture formats may be hesitant to adopt interactive or digital methods, which may require additional training and resources. Programs like INNOTAL have encountered resistance to project-based models, highlighting the need for faculty development alongside student programs.

## Limitations of This Study

1. Limited Access to Program Data While this study covers a wide range of programs, some details—particularly concerning specific program outcomes, funding structures, and student feedback—were limited. Many programs do not publicly disclose complete data, especially regarding long-term success metrics such as graduate employability or economic impact, which could provide more insight into program effectiveness.

### 2. Geographical Constraints

Although the programs studied cover both African and European contexts, data may be skewed by the focus on institutions that have existing partnerships or funding sources. Consequently, this analysis may not fully represent the conditions of smaller HEIs or those in remote areas, which may face unique challenges not captured here.

### 3. Variation in Program Maturity

Some of the programs included are in the early stages, with limited data on long-term impacts, while others are well-established. This difference in maturity means that comparative analysis may not fully reflect potential outcomes or challenges for newer initiatives. Established programs like ACE and AGEA have comprehensive data on outcomes, while newer programs like SFFACCEL and INFUSSE may still be refining their approaches and gathering baseline data. By recognising these challenges and limitations, stakeholders in H EIs and policy-making can better understand the complexities of capacity-building initiatives, paving the way for more effective and inclusive approaches to enhancing digital and entrepreneurial education.

# 9. Recommendations for Capacity Building Programs for HEIs in Both European and African Contexts

Based on the analysis of various capacity-building programs in both European and African contexts, the following recommendations can help enhance the capacity of higher education institutions (HEIs) to address the labor market's unmet needs in digital innovation sectors and close the entrepreneurial skill gaps. These recommendations are designed to ensure that HEIs better align their offerings with the skills needed by industry and foster a more innovative and digitally skilled workforce.

## a) Integrate Entrepreneurship into Core Curricula

Recommendation: HEIs in both Europe and Africa should adopt models similar to Ashesi University's Foundations of Design and Entrepreneurship in Ghana, where all students are required to engage in entrepreneurial projects. This encourages innovation, creativity and problem-solving skills in early academic journey.

### Best Practice:

Ashesi's holistic approach, where entrepreneurship is embedded across all disciplines, equips students to think entrepreneurially, even in non-business fields. Universities should integrate such entrepreneurial thinking into their core curricula, not as an isolated course but as a cross-functional approach that encourages all students to develop business ideas, no matter their field of study.

### Action for European Context:

European universities like Aalto University in Finland already integrate entrepreneurial courses alongside technical subjects. This could be expanded further, encouraging students in STEM and social sciences to engage more actively in business-oriented, innovative projects.

### Action for African Context:

African HEIs can follow Ashesi's model by introducing entrepreneurship as a mandatory component in all programs, supporting students in translating their academic learning into practical business ideas and ventures.

## b) Strengthen Industry-Academia Partnerships for Real-World Exposure

### Recommendation:

African and European HEIs should work to create stronger, more consistent partnerships with industry through co-created programs, internships, and mentorships, much like ACCESS in Ghana, which partners with local companies to tailor curricula and provide internships.

### Best Practice:

ACCESS's industry-aligned model ensures that students are not only trained in theoretical knowledge but also gain real-world experience, boosting their employability. HEIs should foster these partnerships by offering incentives to industries, such as tax rebates or matching funding for industry-academia collaborations.

### Action for European Context:

European universities could leverage Erasmus+ funding to further encourage industry partnerships, integrating more hands-on, industry-relevant content into university programs and ensuring more internship opportunities. Partnerships with tech companies and startups could further enhance the innovation capacity of these institutions.

### Action for African Context:

African universities, such as dLab in Tanzania, could increase engagement with local and international industries to enhance job readiness. Introducing real-world labs where students collaborate with industries on live projects could allow universities to better align their curricula with market needs.

## c) Adopt Blended Learning and Digital Tools to Expand Access and Flexibility
### Recommendation:

Both African and European universities should invest in blended learning models, as demonstrated by dLab, where online platforms allow students to engage with coding and data science regardless of geographical constraints. This flexible approach makes education more accessible, particularly for students in remote areas.

### Best Practice:

The use of digital platforms to deliver courses, as seen with DSI-Africa, ensures that students from diverse locations can access high-quality education. Furthermore, integrating digital tools into classroom learning, like virtual labs or coding boot camps, can enhance student engagement and cater to the growing demand for digital skills.

### Action for European Context:

European universities should enhance their online offerings, particularly in the areas of digital skills and entrepreneurship, and expand the use of digital learning tools and platforms to support hybrid learning environments. This model can ensure continuity of education, especially in uncertain times, and create a more inclusive educational experience for all students.

### Action for African Context:

African universities could look to AFRETEC Network's model of flexible short courses that are digitally accessible. By investing in digital infrastructure and offering more e-learning options, universities can reach underserved communities and equip students with the digital competencies required for the modern workforce.

## d) Foster Interdisciplinary Learning and Collaboration

### Recommendation:

To enhance the capacity of HEIs to address both digital and entrepreneurial skill gaps, HEIs should adopt interdisciplinary programs that blend business, technology, and innovation. As seen in INNOTAL, interdisciplinary Talent Co-Creation Labs that combine engineering, business, and design foster collaboration across fields, encouraging innovation and creative problem-solving

### Best Practice:

The INNOTAL program emphasizes collaborative learning, where students from different disciplines work together to solve real-world business challenges. This interdisciplinary approach should be encouraged across HEIs to help students develop broader skill sets that include digital, entrepreneurial, and problem-solving capabilities.

### Action for European Context:

European universities, especially in technology and engineering, can look to create more interdisciplinary courses that combine engineering, entrepreneurship, and business. Institutions like MIT already have strong models of this, and European universities can expand these initiatives to foster innovation across sectors.

### Action for African Context:

African universities could implement interdisciplinary project-based learning models, similar to CARISCA, to help students across disciplines (like agriculture, technology, and business) collaborate on solving local market challenges, particularly in emerging sectors such as renewable energy, health tech, and agritech.

### e) Encourage Continuous Professional Development for Faculty
### Recommendation:

Both African and European HEIs should focus on faculty development programs that equip educators with the necessary skills to deliver modern curricula, particularly in digital innovation and entrepreneurship. Regular professional development ensures that faculty remain up-to-date with industry trends, pedagogical methods, and digital tools.

### Best Practice:

SASBI in Africa encourages faculty to participate in continuous professional development programs that focus on the latest trends in technology transfer and innovation management. This helps educators bring the latest industry practices into the classroom, ensuring that students receive relevant and up-to-date knowledge.

### Action for European Context:

European universities could implement more formalised professional development opportunities that focus on entrepreneurial teaching methods and digital skills integration, ensuring that faculty are prepared to teach emerging technologies and business models.

### Action for African Context:

African HEIs can benefit from regular workshops and partnerships with industry professionals to ensure that their teaching staff is equipped to deliver cutting-edge education in both digital and entrepreneurial fields. Partnerships with international universities could provide opportunities for faculty exchanges, further enriching the learning environment. By adopting these recommendations, HEIs in both Europe and Africa can enhance their capacity to address the growing demands for digital and entrepreneurial skills in the workforce. These strategies—integrating entrepreneurship into curricula, strengthening industry partnerships, adopting blended learning models, fostering interdisciplinary collaboration, and investing in faculty development—will ensure that HEIs not only equip students with essential skills but also foster innovation, job creation, and economic growth. By learning from each other's successes, HEIs across both continents can create a more resilient, adaptive, and skilled workforce that meets the needs of a rapidly evolving global economy.

## 10. Conclusion

The analysis of various capacity-building programs reveals effective models that African universities can adopt to strengthen digital and entrepreneurial skills among students. Programs like Ashesi University's Foundations of Design and Entrepreneurship in Ghana have proven successful in embedding entrepreneurship within the core curriculum, ensuring all students gain hands-on experience in business creation. This model can be adapted by other African universities to instill entrepreneurial thinking and equip students with practical skills for job creation. The AFRETEC Network provides another valuable approach through its focus on ICT training and flexible, short courses that respond to local market needs. By adopting AFRETEC's modular and industry-relevant curriculum design, universities can offer targeted digital skills training that prepares students for rapidly changing technological landscapes. CARISCA in Ghana exemplifies a program that leverages industry partnerships to provide sector-specific training—in this case, supply chain management—preparing students for specialised roles. This approach could benefit African HEIs aiming to address specific labour market gaps by establishing similar partnerships in other sectors such as agriculture, health, and renewable energy. Additionally, INNOTAL's Talent Co-Creation Labs serve as a model for experiential learning that engages students with real-world projects alongside local businesses, building problem-solving and collaboration skills. This approach could be instrumental for African universities seeking to provide hands-on learning experiences that bridge the gap between academia and industry. To foster more innovative and adaptable learning environments, African universities might also look to dLab in Tanzania, which uses an online platform to teach data science and coding, reaching a broad audience, including those in underserved regions. This model of using technology to extend access to quality education is a powerful tool for expanding digital literacy and inclusivity across the continent. By embracing these programs and their best practices, HEIs, policymakers, and industry leaders in Africa can collaboratively create robust educational frameworks that produce graduates equipped for the demands of digital and entrepreneurial markets. Implementing these strategies can drive sustainable growth, enhance employability, and foster innovation, ultimately contributing to Africa's economic and social development.

## 10. References

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## 11. Appendices

# Appendix 1. The co-created data collection instrumen

UNIHUBS

Fostering Innovation in African HEIs to enhance their relevance for the digital innovation labor market

Co-funded by the European Union

Project Reference: 101128313

**Template for the identification of Erasmus+ Capacity Building Programs and similar initiatives for universities in both European and African contexts, which aims to identify best practices for enhancing HEIs capacity to address market labor unmet needs in digital innovation sectors, as well as entrepreneurial skill gaps.**

**1. General information**

| | |
|---|---|
| Name of the initiative/program | |
| Countries involved | |
| Website | |
| Project coordinator & contact details | |
| Duration | |
| Delivery mode (online, face-to-face, hybrid) | |
| Target audience | |

**2. Description of the Capacity Building program/initiative**

| | |
|---|---|
| Objectives | |
| Curriculum overview, including key courses/contents/modules (up to 150 words) | |
| Skills/competencies covered (keywords) | |
| Metrics of success (if applicable) | |

3. **Best practices for enhancing HEIs capacity**

| | |
|---|---|
| Identified practices (teaching methods, curriculum design, industry engagement strategies, use of technology, etc.) | |
| Examples of success | |

| | |
|---|---|
| (publications, case studies, testimonials, etc.) | |
| Policy recommendations (curriculum enhancements, improved industry collaboration, adoption of new methodologies, technology, regulatory changes etc.) | |
| Any additional feedback (open feedback from participants, suggestions for Future Research | |

## Appendix 2.

Collected initiatives All the initiatives can be found here:

https://www.dropbox.com/scl/fi/oigmywb8pyvthymtxzo8h/ALL_best_practices_Unihub sOctober2024.docx?rlkey=yawntxlam9zp8aml95rzci4k4&st=qwojg31p&dl=0 -

AEDIB|NET - AfriLabs - MRCI - ACE - ACCESS - dLab - Innoversity - AHEAD - CARISCA - INNOTAL - ASEAN - AGEA - SASBI - INFUSSE - SFFACCEL - AFRETEC - DSI - Impression - InfPrev4frica - CONTAN - AfriCon E