

Competence Framework

WP3 - Competence
Framework, Curriculum
Development and Educational
Resources

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contents

01	Introduction
02	Methodology
03	Competence Framework Overview
04	Core Competence Framework Dimensions and Elements
05	Implementation Mechanism
06	Conclusions

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This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use, which may be made of the information contained therein 2022-2-IE01-KA220-VET-000099060

01

Introduction



Executive Summary

Primary Stakeholders

Educators: Implement structured modules & digital tools for enhanced teaching. **Students:** Develop essential skills for sustainable entrepreneurship & digital innovation. **Entrepreneurs & SMEs:** Leverage the framework for business model sustainability & digital readiness. **Policy Makers & HEI Administrators:** Adapt the curriculum to emerging industry needs & global policy trends.

The Framework

The START-DSP Competency Framework equips Higher Education Institutions (HEIs) with the necessary tools to integrate **Entrepreneurship, Digital transformation & Sustainability** into their curricula. By aligning with *EntreComp, DigiComp and GreenComp*, this framework ensures that students and educators develop future-ready skills essential for fostering innovation, ethical business practices and environmental responsibility. This framework contributes in shaping a more innovative, sustainable and digitally empowered workforce.

The curriculum

Modular Design: Flexible integration into various educational contexts.

Competency-Driven Approach: Focuses on entrepreneurship, digital literacy and sustainability

Interactive Learning Tools: Incorporates the Innovative Business Model Assessment Web-App.

Bridging Theory & Practice: Promotes experiential learning, case studies and interdisciplinary collaboration.

Scalability & Adaptability: Can be tailored for different HEIs, SMEs and policy frameworks.

Framework Alignment Across Key Competency Areas

The framework offers an integrated model that systematically aligns the European competence frameworks EntreComp (entrepreneurship), DigiComp (digital competence) and GreenComp (sustainability) within a unified structure for practical application. It organizes competencies into five interrelated dimensions: Sustainable Business Modeling, Digital Transformation and Entrepreneurship, Resource and Risk Management, Community and Ethical Impact, and Environmental Responsibility. Each dimension synthesizes entrepreneurial innovation and opportunity recognition, the strategic use of digital tools and data-driven decision-making, and the principles of the circular economy and environmental, social, and governance (ESG) practices. Through this integrated approach, the framework provides a comprehensive foundation for fostering sustainable business practices, ethically responsible digitalization, and ecologically sound strategies that collectively advance economic, social, and environmental objectives. These ambitions are translated into achievable and realistic goals

through the following key objectives:

Competency-Driven Learning: Structuring education around entrepreneurial thinking, digital literacy, sustainability awareness, and governance to ensure learners develop adaptable and future-proof skills.

Interactive Learning Tools: Providing innovative resources, including the Innovative Business Model Assessment Web-App, which delivers real-time feedback on business model viability, sustainability impact, and digital integration.

Knowledge Accessibility and Adoption: Disseminating tools and materials through a digital knowledge hub to encourage broad adoption among educators, students, and industry stakeholders.

Bridging the Theory–Practice Gap: Promoting real-world application through case studies, experiential learning, and collaboration with industry partners.

Governance and Policy Literacy: Ensuring learners understand corporate governance, ESG principles, and regulatory compliance, thereby strengthening ethical decision-making and leadership capacities.



02

Methodology



2.1 Needs Analysis and Stakeholder Engagement

This data-driven approach ensures that the framework is practical, evidence-based, and adaptable to diverse educational and business contexts, providing a relevant and scalable model for fostering entrepreneurial, digital and sustainability competencies.

The development of the Competence Framework was informed by a comprehensive needs analysis to ensure alignment with real-world educational and industry demands. **This phase incorporated:**

- **Extensive desk research**

Reviewing existing competency frameworks (EntreComp, DigiComp, GreenComp), industry reports and academic literature on entrepreneurship education, digital transformation and sustainability.

- **Stakeholder interviews**

Engaging educators, entrepreneurs, policymakers, and industry professionals to identify gaps in entrepreneurship education, particularly in the areas of sustainability, digitalization and governance.

Surveys and feedback collection: Gathering insights from HEIs, SMEs and students to prioritize key competencies, highlight challenges and refine the framework's structure.

2.2 Research and Data Collection

The Competence Framework development employed a mixed-methods approach to ensure a comprehensive and validated competency structure.



Quantitative Data Collection

Surveys conducted with HEIs, SMEs and students to identify broad trends in digital and sustainability skill gaps.

Qualitative Insights

Semi-structured interviews and focus groups with educators, entrepreneurs and policymakers to gain a deeper understanding of context-specific competency needs.



2.2 Research and Data Collection



Benchmarking & Case Study Analysis

Reviewing existing competency frameworks, best practices, and real-world case studies to identify integration opportunities and ensure alignment with evolving market demands.

Key Findings

The key findings from this research phase directly informed the alignment of EntreComp, DigiComp and GreenComp within the framework, ensuring that it effectively supports digital twin transitions, sustainability challenges and entrepreneurial skill development for HEIs.





2.3 Desk Research Findings and Skill Selection for the Competence Framework

The desk research conducted for the START-DSP project provided valuable insights into integrating entrepreneurial, digital, and sustainability skills within higher education and entrepreneurial ecosystems. This phase included analyzing existing frameworks (EntreComp, DigiComp, GreenComp), reviewing academic literature and conducting interviews with educators, entrepreneurs and industry stakeholders to identify key competency gaps and priority areas.

Findings highlight a growing need for multidisciplinary education that connects entrepreneurial thinking, digital transformation and sustainability to prepare learners for the rapidly evolving business landscape.

Analysis

The analysis of interviews with both educators and entrepreneurs reveal a clear consensus regarding the critical importance of integrating sustainability and digital skills into entrepreneurship education. According to the data, "Many educators emphasize the importance of connecting theoretical knowledge with practical, real-world experiences" while entrepreneurs consistently highlight that they are "committed to improving their environmental and social impact, whether through carbon neutrality, waste reduction, or community engagement."

This alignment between academic priorities and industry needs underscores the necessity for a competence framework that bridges theoretical foundations with practical applications.

Evaluation

A significant gap identified across both groups relates to advanced technological competencies. As the report indicates, "Entrepreneurs report a lack of expertise in AI, machine learning, and data analytics, which are crucial for enhancing decision-making and operational efficiency". Similarly, educators stress that "Proficiency in digital tools and technologies is also critical. This includes understanding and making good use of AI, digital signal processing, Geographic Information Systems (GIS), and other digital platforms for environmental monitoring, data analysis, and optimizing business processes". These findings suggest that the competence framework should prioritize technical skills alongside ethical considerations of technology implementation.



2.3 Desk Research Findings and Skill Selection for the Competence Framework

Highlights

The research highlights a notable deficiency in forward-thinking capabilities within the existing competence landscape. As stated in the analysis, "Many respondents recognize that they have not fully embraced 'Futures Literacy' or 'Anticipatory Thinking.' While they are effective at implementing current sustainable practices, there is a noticeable gap in their ability to plan for and adapt to future sustainability challenges, trends, and innovations". Educators similarly acknowledge that "futures literacy, which involves preparing for and shaping future scenarios, is identified as underrepresented". This indicates that the competence framework must emphasize strategic foresight and scenario planning to prepare entrepreneurs for evolving sustainability demands.

Integration of sustainability values into core business strategies emerges as a foundational requirement. The report emphasizes that entrepreneurs need "Ensuring sustainability is ingrained in the company culture... This involves not only training but also creating incentives and recognition programs to encourage sustainable practices at all levels of the organization".

Educators reinforce this by advocating for "a deeper integration of systems thinking. While the concept is acknowledged, it's often not explicitly formalized in current educational frameworks". The competence framework should therefore address both technical skills and transformational mindsets, encouraging entrepreneurs to view sustainability not as a regulatory burden but as a strategic opportunity for innovation and competitive advantage.

Key Insights from the Research

Educator's perspective:

Sustainability integration is increasing through circular economy principles, social entrepreneurship and digital innovation tools. Gaps remain in anticipatory thinking, systems thinking, and policy literacy, which are crucial for navigating the digital-green transition. Experiential learning is key, where students engage with data analytics, AI tools and digital modelling to address real-world sustainability challenges

Entrepreneurs' perspective:

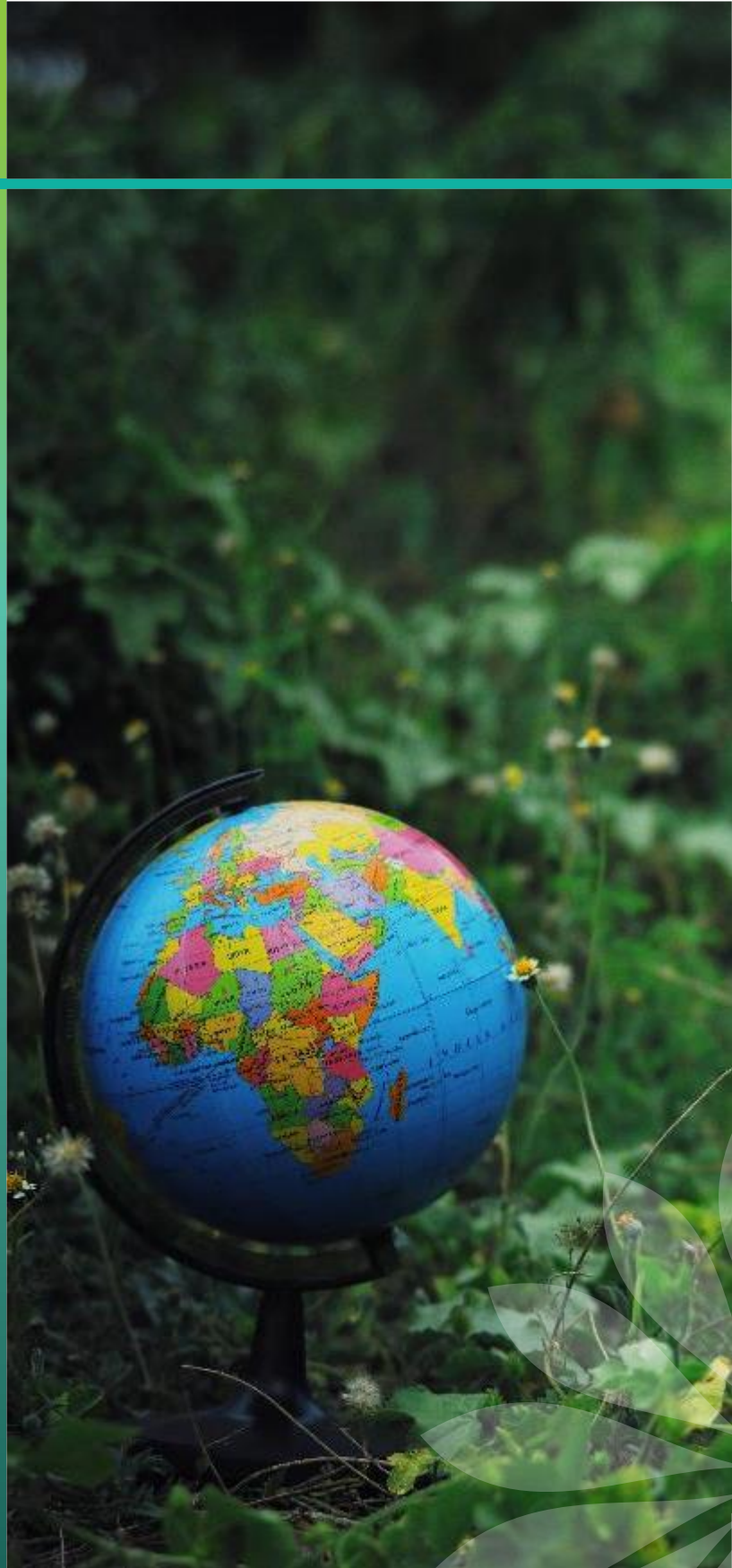
Strong industry demand for advanced digital competencies, particularly AI, cybersecurity and data-driven decision-making. Identified gaps in green digital skills, such as renewable energy solutions, sustainable IT infrastructure and ESG-aligned business models. Ethical leadership and community engagement are critical for sustainable entrepreneurship, ensuring businesses align with corporate social responsibility (CSR) and sustainability frameworks. (CSRD, 2022).

Competency Priorities for the Framework

Based on the findings, the Competence Framework prioritizes five key dimensions:

- **Sustainable Business Modelling**
Embedding circular economy strategies and green innovation in business development.
- **Digital Transformation & Entrepreneurship**
Leveraging AI, machine learning and cybersecurity for business efficiency.
- **Resource & Risk Management**
Utilizing data analytics and legal frameworks to support ethical decision-making.
- **Community & Ethical Impact**
Strengthening corporate social responsibility (CSR) and ethical business leadership.
- **Environmental Impact & Responsibility**
Promoting carbon reduction, green digital tools and biodiversity conservation.

These competencies align with EU policy priorities while addressing real-world challenges faced by educators, students and entrepreneurs. The framework bridges the gap between theory and practice, ensuring learners develop actionable skills that drive digital innovation and sustainability in the modern economy.



03

Competence Framework Overview



3. COMPETENCE FRAMEWORK OVERVIEW

The framework connects entrepreneurship, digital transformation and sustainability through five structured competency dimensions:

01

Dimension 1: Sustainable Business Modeling

GreenComp: Socially and environmentally responsible business models. **EntreComp:** Entrepreneurial thinking for sustainable markets.

DigiComp: Digital tools for sustainability in business.

02

Dimension 2: Digital Transformation and Entrepreneurship

DigiComp: Digital literacy, AI tools, cybersecurity.

EntreComp: Innovation-driven entrepreneurship. **GreenComp:** Sustainability in digital processes

03

Dimension 3: Resource and Risk Management

EntreComp: Managing resources and minimizing risks.

DigiComp: AI and data analytics for forecasting. **GreenComp:** Sustainable decision-making in resource allocation

3. COMPETENCE FRAMEWORK OVERVIEW

The framework connects entrepreneurship, digital transformation and sustainability through five structured competency dimensions:

04

Dimension 4: Community and Ethical Impact

EntreComp: Value creation for communities. **DigiComp:** Ethical use of digital tools. **GreenComp:** Co-creation of sustainable initiatives

05

Dimension 5: Environmental Impact and Responsibility

GreenComp: Assessing and mitigating environmental impact. **EntreComp:** Supporting sustainability-driven business ideas. **DigiComp:** AI-driven waste management solutions





3.1 Implementation in Curriculum Development

This structured approach ensures that HEI students are equipped with the competencies necessary to thrive in an interconnected, digital and sustainable economy.

HEI educators can tailor curricula by aligning courses with the competency dimensions.

Modular integration allows:

- Sustainability-focused courses to emphasize GreenComp.
- Technology and digital transformation programs to highlight DigiComp.
- Entrepreneurship and innovation curricula to incorporate EntreComp.

Assessment strategies include:

- Competency-based rubrics for tracking student progress.
- Project-based learning approaches such as case studies, simulations, and real-world entrepreneurial applications.
- Innovative Business Model Assessment Web-APP, enabling students to evaluate business viability through sustainability and digital competency metrics.

04

Core Competence Framework Dimensions and Elements



4. Core Competence Framework Dimensions and Elements

The START-DSP Competence Framework is structured around five core competence areas, each integrating elements from the European Commission's EntreComp, DigiComp and GreenComp frameworks. This design ensures that Higher Education Institutions (HEIs) can provide a holistic education that equips students with essential entrepreneurial, digital and sustainability skills.

Sustainable Business Modelling: This area focuses on developing competencies in creating business models that incorporate circular economy principles and green innovation. Students learn to design ventures that are not only profitable but also environmentally responsible and socially equitable.

Digital Transformation and Entrepreneurship: Emphasizing the integration of digital technologies into business practices, this area covers skills in AI, machine learning and data analytics. Learners are prepared to leverage these technologies to drive innovation and maintain competitiveness in the digital economy.

Resource and Risk Management: This competence area addresses the strategic use of resources and the identification and mitigation of risks. It includes training in data-driven decision-making, legal frameworks and ethical considerations, enabling students to manage enterprises sustainably and responsibly.

Community and Ethical Impact: Focusing on the societal role of businesses, this area cultivates skills in corporate social responsibility (CSR), ethical leadership and community engagement. Students learn to align business objectives with societal needs, fostering trust and positive impact.

Environmental Responsibility: This area promotes competencies related to environmental stewardship, such as carbon footprint reduction, adoption of green technologies and biodiversity conservation. Learners are equipped to implement practices that contribute to environmental sustainability.

The development of these core competence areas was informed by comprehensive desk research and stakeholder analysis, revealing a growing demand for multidisciplinary learning that integrates entrepreneurial thinking, digital transformation and sustainability practices. Both educators and entrepreneurs emphasize the importance of practical skill development in these domains, highlighting the need for a balanced approach that combines theoretical knowledge with real-world application. By focusing on these competencies, the framework aims to empower learners to drive innovation and sustainability in a rapidly evolving economic landscape.

4.1 Alignment with the European Frameworks

Key Competencies: Spotting opportunities, Creativity and innovation, Ethical and sustainable thinking, Managing resources and risks, Collaboration and communication

The combined implementation of EntreComp, DigiComp and GreenComp represents a unified approach to competence development that aligns with Europe's vision for an inclusive, digital and sustainable society. These frameworks intersect at the point where entrepreneurship enables innovation, digital competence provides the tools for transformation and sustainability ensures responsibility and long-term value creation.

For education, this tri-competence model supports curriculum design that integrates entrepreneurial projects, digital literacy and sustainability challenges into cohesive learning experiences. For industry and policy, it offers a roadmap for developing future-ready professionals capable of leading the green and digital transitions central to Europe's competitiveness and resilience.

Entrepreneurial Competence – EntreComp

The European Entrepreneurship Competence Framework (EntreComp) defines entrepreneurship as the capacity to act upon opportunities and ideas to create value for others (European Commission, 2016). It conceptualizes entrepreneurship not merely as business ownership but as a transversal competence relevant to all areas of life, including education, employment and active citizenship. In dynamic and uncertain socio-economic environments, entrepreneurial competence represents a combination of creativity, initiative, resilience and ethical judgment.

EntreComp emphasizes three overarching dimensions of entrepreneurial capacity: generating ideas and opportunities, mobilizing resources and turning ideas into action. Within these areas lie key competences such as spotting opportunities,

creativity, ethical and sustainable thinking, collaboration, managing resources and taking initiative. Together they shape the behavioral profile of individuals capable of identifying needs, innovating within constraints and converting ideas into solutions that generate cultural, social or economic value.

EntreComp's pedagogical value is particularly evident in higher education, where it supports curricula that develop entrepreneurial mindsets through experiential learning, community engagement and interdisciplinary projects (Bacigalupo et al., 2016). Learners progress from recognizing opportunities and developing curiosity to experimenting, leading innovation and mentoring peers. Observable behaviors include proactive problem identification, design thinking, and value creation.

Assessment strategies aligned with EntreComp include reflective journals, business simulations and innovation portfolios that capture both cognitive understanding and behavioral demonstration. Key performance indicators (KPIs) may involve new venture creation, participation in social enterprise initiatives or measurable community impact. Learning pathways emphasize challenge-based learning, mentorship and project incubation, embedding "learning by doing" as the central pedagogical philosophy (European Commission, 2016).

Ultimately, EntreComp nurtures creative and responsible action, helping individuals to envision opportunities and implement them sustainably. It supports the European Skills Agenda's objective of developing adaptable, inclusive and entrepreneurial citizens able to drive sustainable growth (European Commission, 2020).

4.1 Alignment with the European Frameworks

Key Competencies: Information and data literacy, Digital communication and collaboration, Digital content creation, Privacy, security and digital well-being, Problem-solving and innovation using technology

Digital Competence – DigiComp

The Digital Competence Framework for Citizens (DigiComp) provides a comprehensive model for understanding and developing digital skills essential for employability, inclusion and active participation in a rapidly digitizing society (Vuorikari, Kluzer, & Punie, 2022). Digital competence is defined as the confident, critical and responsible use of digital technologies for learning, work and social interaction. It integrates technical proficiency with ethical, cognitive and socio-emotional capacities necessary for digital transformation.

DigiComp articulates five interconnected areas: information and data literacy, communication and collaboration, digital content creation, safety and well-being and problem-solving. These dimensions move learners beyond simple tool use toward critical awareness and innovation. They foster digital fluency, resilience and an ability to navigate complex information ecosystems.

In educational and entrepreneurial contexts, DigiComp serves as both an instructional framework and a policy instrument. It enables learners to leverage digital tools to enhance innovation, transparency and efficiency (European Commission, 2022). Entrepreneurs and organizations apply these competencies to drive green and digital transitions, combining technological advancement with sustainable business models (García-Morales, Martín-Rojas, & Lardón-López, 2021).

Behaviorally, digital competence manifests through effective online communication, ethical data management, creative content generation and digital problem-solving. Proficiency development ranges from basic digital literacy to advanced data analytics

and automation capabilities. At higher levels, individuals lead digital transformation and advocate for digital inclusion and security.

Assessment approaches for DigiComp may include digital portfolios, project-based evaluations or simulated problem-solving scenarios. KPIs can involve digital project outcomes, evidence of data-driven decision-making or participation in digital innovation initiatives. Learning pathways combine formal instruction in digital literacy with experiential and informal learning such as open-source collaboration and digital entrepreneurship challenges.

DigiComp reinforces the European Commission's twin goals of digital transformation and sustainability, promoting what is sometimes called the "twin transition", where technological innovation supports environmental and social goals (European Commission, 2021). It prepares individuals to act as critical, creative and responsible digital citizens in an increasingly interconnected world.

4.1 Alignment with the European Frameworks

Key Competencies: The value of sustainability and ethical responsibility, systems of critical thinking, envisioning sustainable futures, acting for environmental and social transformation, promoting equity, inclusion and resilience.

Sustainability – GreenComp

The European Sustainability Competence Framework (GreenComp) offers a holistic structure for developing sustainability-oriented values, knowledge and behaviors (Bianchi et al., 2022). It defines sustainability competence as the ability to embody sustainability principles and take responsible action that respects environmental limits, promotes social justice and ensures long-term economic well-being.

GreenComp reflects a systems approach to learning, emphasizing that sustainability is not limited to environmental awareness but entails the transformation of societal, economic, and institutional structures (European Commission, 2022). It encompasses four interdependent competence clusters: embodying sustainability values, embracing complexity, envisioning sustainable futures and acting for sustainability.

Behaviorally, sustainability competence involves critical systems thinking, ethical decision-making, collaborative innovation and leadership for change. Learners demonstrate these competences when they can recognize interconnections among ecological and social systems, imagine alternative futures and engage in collective action for sustainable transformation (Bianchi et al., 2022).

Proficiency evolves from awareness of sustainability concepts to autonomous leadership in implementing and advocating for systemic change. Assessment methods include reflective narratives, community engagement projects or evidence of tangible environmental and social impact. KPIs may cover sustainability initiative participation, reduction of ecological footprints or integration of sustainability metrics in organizational strategies.

Learning pathways are experiential, interdisciplinary and transformative. They may involve sustainability labs, circular economy projects, community partnerships or policy simulations that foster both practical skills and values-based reasoning. GreenComp thus positions sustainability as a core competence for employability, innovation and citizenship, aligned with the European Green Deal and the United Nations Sustainable Development Goals (European Commission, 2022).

When integrated with EntreComp and DigiComp, GreenComp ensures that innovation and digital transformation occur within ethical, ecological and socially responsible boundaries. It empowers individuals to become agents of sustainable change in their professions and communities.



Tri-Framework Integration Overview

Together, these frameworks create a competence ecosystem that develops entrepreneurial, digital and sustainability mindsets, essential for navigating the intertwined economic, technological and environmental transitions of the 21st century.

01

EntreComp

Innovation and value creation

02

DigiComp

Digital fluency and responsible technology use

03

GreenComp

Sustainability literacy and transformative action

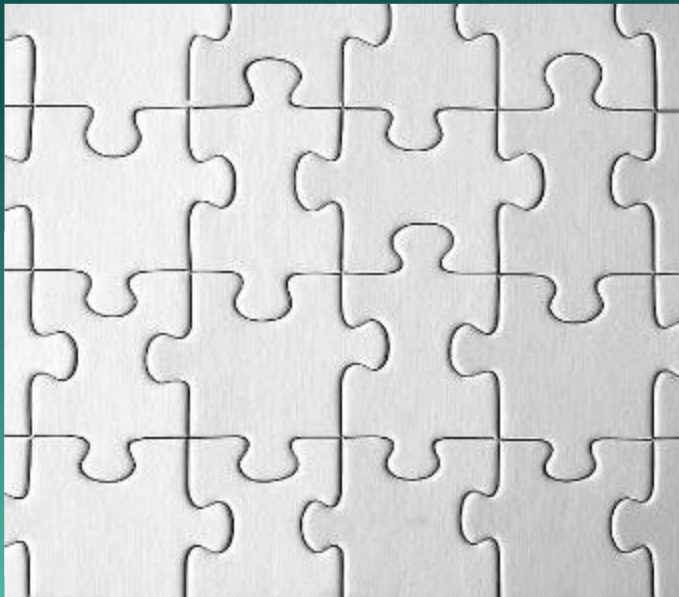
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Implementation Mechanism



5.1 Curriculum Design and Supporting Materials

The curriculum is developed to be modular, adaptable and aligned with the EntreComp, DigiComp and GreenComp frameworks.



Modularity

Courses are designed to suit diverse maturity levels, allowing institutions to implement full curricula or specific modules based on their needs.

Competence Alignment

Each module targets specific competencies, ensuring comprehensive coverage of entrepreneurial, digital and sustainability skills.



5.1 Curriculum Design and Supporting Materials

The curriculum design prioritizes relevance and practical application, equipping students with tools to address real-world challenges in entrepreneurship, digital transformation and sustainability.



Multimedia Resources

Includes interactive case studies, videos, infographics and simulations to enhance engagement and understanding.

Open Educational Resources (OERs)

Ensures accessibility by publishing materials under open licenses, enabling broad adoption across regions.



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Essential Knowledge and Implementation Guidelines for Educators

For educators to effectively apply the START-DSP Competency Framework, a clear understanding of its core components and teaching methodologies is essential. Educators should have a foundational grasp of entrepreneurial thinking (EntreComp), digital literacy (DigiComp) and sustainability principles (GreenComp) to facilitate student engagement and competency development. Baseline knowledge areas include digital business models, circular economy concepts, ethical decision-making in entrepreneurship and data-driven innovation.

To ensure structured application across different Higher Education Institution (HEI) contexts, educators can follow a step-by-step implementation guide:

- **Assess Existing Curriculum & Needs**
Identify gaps where entrepreneurial, digital and sustainability competencies can be embedded.
- **Select Relevant Teaching Strategies**
Incorporate case-based learning, project-based learning, and experiential simulations to foster practical skill application.
- **Leverage Digital Tools & Collaborative Learning**
Utilize online knowledge hubs, business model assessment tools, and interdisciplinary teamwork to enhance learning outcomes.
- **Monitor & Adapt Curriculum**
Implement formative assessments, industry feedback loops and student reflections to continuously improve competency-based education.

By aligning with EntreComp, DigiComp, and GreenComp, educators can tailor instructional approaches to different disciplines while ensuring students develop future-ready skills applicable to entrepreneurial and professional environments.

5.2 Adaptive Modular Design

Adaptive modular design emphasizes creating flexible learning modules that cater to diverse skill levels and professional backgrounds. This approach ensures that both novice and experienced educators can effectively deliver competency-based learning aligned with the framework's goals. Customization allows content to be tailored based on educator expertise and learner needs, while scalability supports transitions from basic concepts to advanced applications. Flexibility ensures seamless integration into various educational contexts, such as workshops, classrooms and online learning platforms.

5.3 Educator Pathways

Educator pathways are structured into three tiers to address different levels of experience and expertise. Beginner educators, who are new to digital transformation, sustainability, or entrepreneurship, focus on foundational concepts of GreenComp, DigiComp and EntreComp, learning basic lesson planning and using pre-designed tools. Intermediate educators delve deeper, integrating sustainability and entrepreneurship concepts while employing adaptive teaching techniques, such as collaborative projects combining frameworks like GreenComp and DigiComp. Advanced educators design tailored modular programs, create new resources aligned with competency frameworks and mentor novice educators. Their work culminates in real-world workshops to enhance peer learning and application.

5.4 Practical Implementation

To support educators and institutions in effectively implementing the START-DSP Competency Framework, a structured application guide is essential. Institutions can integrate the framework

into their existing curricula by incorporating modular learning components that align with EntreComp, DigiComp and GreenComp. For instance, HEIs can embed sustainability-focused entrepreneurship modules into business courses, ensuring that students gain both digital literacy and sustainability awareness while developing entrepreneurial skills. Additionally, digital competency training can be integrated into project-based learning to enhance students' ability to work with AI tools, data analysis and cybersecurity principles.

To facilitate implementation, educators first assess their competency level through a self-assessment tool to select an appropriate pathway. A modular toolkit provides tailored resources such as lesson plans, digital tools and program design templates. Continuous support and feedback are ensured through online educator communities that foster resource sharing and best practices. Beginner educators submit basic lesson plans for review, intermediate educators design collaborative projects and advanced educators develop workshops piloted in real-world contexts.

A key strategy in ensuring the successful application of the framework is the use of collaborative learning approaches. For example, interdisciplinary projects involving business, IT, and environmental studies students can create a real-world entrepreneurial ecosystem, encouraging problem-solving through digital and sustainable solutions. Furthermore, partnerships with local businesses, startups and NGOs provide students with hands-on experience, enabling them to apply theoretical knowledge to industry challenges. These collaborative methods not only reinforce academic learning but also enhance employability by fostering innovation and real-world problem-solving skills.

5.5 Teaching Strategies and Educator Guidance

The framework offers detailed guidance and innovative teaching strategies to enhance delivery. Interactive techniques like project-based learning and problem-solving workshops contextualize teaching through real-world scenarios. Step-by-step guides and assessment tools, such as rubrics and the Innovative Business Model Assessment Web-APP, ensure consistent evaluation and support competency development. Educators are equipped to integrate the framework seamlessly into their curricula, promoting effective and impactful learning experiences.

5.6 Case Study Implementation

Case studies are vital in translating GreenComp principles into actionable projects, bridging the gap between theory and practice. Through real-world examples, learners explore sustainability practices and develop creative solutions to environmental challenges. Patagonia's Worn Wear Program highlights systems thinking and sustainability values through a circular economy model, while Grameen Shakti's solar energy initiative demonstrates critical thinking and responsibility in addressing energy poverty (Batten, 2020.) Freiburg's Green City Initiative showcases collaboration and systems thinking in urban sustainability (Internet Geography, n.d.). Learners analyze these case studies, design sustainability projects, and present proposals using structured templates for analysis and creation. Activities include peer review and feedback, fostering a collaborative learning environment that emphasizes practical application and impact assessment. (Neck & Corbett, 2018).

5.7 Collaborative Learning and Knowledge Hub Utilization

The project promotes a collaborative learning environment by encouraging active engagement among students, educators and external stakeholders. It integrates interdisciplinary group projects that mimic entrepreneurial ventures with a focus on sustainability and digital transformation, fostering teamwork and innovation. Partnerships with local businesses provide practical experience, such as evaluating sustainable practices in startups, while collaborations with NGOs address pressing community challenges like waste management and renewable energy solutions. A comprehensive Knowledge Hub serves as a digital repository, offering open access to curriculum materials, templates, case studies and multimedia content such as tutorials, webinars and podcasts. This platform also facilitates collaborative discussions, peer learning, and resource sharing. Additionally, its global reach enables cross-border collaboration, allowing higher education institutions (HEIs) from diverse regions to exchange best practices and insights. By harnessing the power of technology and fostering collaboration, the framework cultivates a dynamic and engaging learning ecosystem.

Implementation Mechanism

5.8 Testing, Validation and Feedback Mechanisms

The framework incorporates a robust testing and validation mechanism to ensure its practicality and effectiveness. Pilot testing is conducted in select higher education institutions (HEIs) to evaluate usability and gather data on student performance, engagement and skill acquisition.

Feedback loops engage educators, students and stakeholders to identify gaps and areas for improvement, enabling iterative refinement of the curriculum and resources. Evaluation metrics, including competency acquisition aligned with EQF standards, student satisfaction, and relevance to real-world scenarios, provide qualitative and quantitative insights for continuous improvement. This approach ensures adaptability to evolving educational needs. Additionally, the integration of the Corporate Sustainability Reporting Directive (CSRD) into entrepreneurship education emphasizes the importance of aligning business practices with sustainability regulations.

By exploring ESG metrics, reporting frameworks like GRI and SASB and strategies for legislative compliance, learners gain practical skills to create sustainability roadmaps and compliance strategies. Educators are supported with resources like CSRD reporting checklists and sustainability roadmap templates, ensuring the alignment of entrepreneurship education with contemporary legislative and sustainability standards.





06

Conclusions



6. Conclusions

The START-DSP Competence Framework represents a significant advancement in rethinking entrepreneurship education for the digital and green transformation of European Higher Education Institutions (HEIs). By strategically integrating the EntreComp, DigiComp and GreenComp frameworks, the project has demonstrated how entrepreneurship education can evolve from traditional business-centered paradigms into multidimensional learning ecosystems that promote innovation, sustainability and ethical leadership.

The framework's modular and competence-based design ensures its adaptability across educational contexts, enabling HEIs to embed sustainability, digital literacy and entrepreneurial thinking into curricula at various levels. Its evidence-based development, grounded in comprehensive needs analyses, stakeholder engagement and pilot testing, positions it as a practical and scalable model for future-focused education.

Key achievements include:

- Bridging the theory, practice gap through experiential learning, case-based teaching and the Innovative Business Model Assessment Web-App.
- Empowering educators with adaptive pathways and open-access resources that promote collaborative learning and continuous professional development.
- Aligning with EU policy priorities, notably the European Green Deal, the Digital Education Action Plan and the Corporate Sustainability Reporting Directive (CSRD), ensuring regulatory and market relevance.
- Fostering interdisciplinary collaboration between educators, students, entrepreneurs and policymakers, creating a shared understanding of

sustainable and digital entrepreneurship.

Ultimately, START-DSP redefines entrepreneurship education as a driver of systemic transformation, cultivating learners who are not only digitally competent and entrepreneurially skilled but also environmentally conscious and socially responsible. The framework's integration of sustainability, ethics and innovation provides a blueprint for building a resilient, inclusive and future-ready European knowledge economy.

Future work should focus on expanding the framework's implementation across diverse educational and regional contexts, establishing longitudinal studies to measure competence development over time and enhancing the digital platform to facilitate transnational collaboration and data-driven evaluation.

Through continued research, partnership and innovation, the START-DSP framework has the potential to become a cornerstone for sustainable, digital and entrepreneurial education across Europe and beyond.

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ANNEX I

Glossary of Terms

QF (European Qualifications Framework): A standardized framework developed by the European Union to map qualifications across countries, enabling clear comparison of learning achievements. It includes eight levels, ranging from basic education to advanced academic qualifications.

EntreComp (European Entrepreneurship Competence Framework): A framework developed by the European Commission to foster entrepreneurial skills, emphasizing opportunity recognition, creativity and value creation in business and society.

DigiComp (Digital Competence Framework): A European Commission framework that focuses on digital literacy, including skills such as data management, cybersecurity and the responsible use of digital technologies.

GreenComp (Sustainability Competence Framework): Introduced by the European Commission, this framework defines sustainability competencies, promoting awareness of environmental, economic and social impacts to encourage responsible and innovative practices.

Sustainability Metrics: Quantitative measures are used to assess the environmental, social, and economic impact of a process, product, or organization. Examples include carbon footprint, energy efficiency and waste reduction metrics.

Business Model Assessment Web-APP: An interactive tool developed within the START-DSP project to evaluate sustainability, growth potential, and digital transformation readiness of business models, offering personalized feedback.

HEI (Higher Education Institution): Refers to universities, colleges, and other educational organizations that provide tertiary education and research opportunities.

Knowledge Hub: A digital platform within the START-DSP project that hosts open educational resources, multimedia content and tools for collaborative learning and resource sharing.

ANNEX II: Complementary Resources and Materials



[EntreComp: The entrepreneurship competence framework - European Commission](#)

[Digital Competence Framework for Citizens \(DigiComp\) - European Commission](#)

[GreenComp - Policy background and methodology - European Commission](#)

[Resources – EntreComp Europe](#)

[EntreComp – the European Competence framework: for Erasmus+ National Agencies - Webinar – YouTube](#)

[European Entrepreneurship Competence Framework](#)

[Introducing GreenComp - the European sustainability competence framework](#)

[Why Use the European e-Competence Framework?](#)

[EntreComp – the European Competence framework: for Policymakers – Webinar](#)

[GreenComp: taking green skills one step further](#)

[DigiCompEdu – YouTube](#)

[Skills for the green transition – for a competitive Europe – YouTube](#)

[EU Green Deal: Political framework for the heating market – YouTube](#)

[Entrepreneurship is about spotting opportunities – YouTube](#)

[Environmental, Social and Governance \(ESG\) | Framework and Standards – YouTube](#)

[EntreComp4Transition- Facebook Page](#)

[EntreComp for Digital - Virtual Study Visit - Part 2: Girls Go Circular, 2BDigital, YOU WEEN](#)

[Green Comp in Practice](#)