



DesignSmart

Empowering VET and Women Entrepreneurs for Sustainable Fashion Innovation

WP2 – Sustainable Fashion and AI Curriculum
T2.1 – Research Framework & Needs Assessment
T2.2 – Desk & Field Research Analysis

TRANSNATIONAL ANALYSIS REPORT

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Countries: Italy • Greece • Spain • Cyprus

Organisations: POLICA, BASE3, LCB, CCIB, PlanB, EUROTraining, People Forward

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Consortium and Project Information

This Transnational Analysis Report is produced within the DesignSmart project, co-funded by the Erasmus+ Programme of the European Union. It consolidates the four national reports prepared by the project partners in Italy, Greece, Spain and Cyprus.

Consortium

Partner	Organisation
P1	Leather Cluster Barcelona (LCB), Spain – Coordinator
P2	Eurotraining, Greece
P3	People Forward (PF), Cyprus
P4	BASE3 Società Cooperativa (Base3), Italy
P5	Cámara de Comercio Italiana – Barcelona (CCIB), Spain
P6	PlanB, Greece
P7	Politecnico Calzaturiero (PC), Italy

Project Information

Field	Detail
Project title	Empowering VET and Women Entrepreneurs for Sustainable Fashion Innovation
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Executive Summary

This Transnational Analysis Report synthesises the four DesignSmart national reports — Italy, Greece, Spain and Cyprus — into a single comparative picture of the fashion and footwear ecosystem, its readiness for the green and digital twin transition, and the vocational training needs that must be met to support it.

It draws on harmonised desk research, structured questionnaires distributed in each country, and national focus groups, and it translates the resulting evidence into a shared competence framework that will anchor the curriculum developed under SO2.2.

The sector across the four countries

All four partner countries share a fashion economy that is overwhelmingly built on micro and small enterprises, yet they differ sharply in scale and orientation. Italy is a European production powerhouse — around 62,000 fashion-system firms, €102.1 billion in turnover and €69.9 billion in exports — with dense specialised districts in footwear, leather goods and textiles.

Spain combines strong export capacity (around €23–31 billion depending on definition) with influential regional clusters in Catalonia, Valencia and Galicia, and a leather ecosystem centred on Igualada and Barcelona.

Greece presents a fragmented, retail-and-import-oriented sector of roughly €2.68 billion in retail sales, where almost all firms are very small and technologically lagging. Cyprus is the smallest and most import-dependent: its "fashion economy" is essentially a retail-and-trade system with a tiny manufacturing base and a heritage-craft niche (Lefkara lace, Fythkiotika weaving).

Despite these differences, the structural pattern is identical: **SMEs dominate (90–99.9% of firms), sustainability awareness is high but operational implementation is uneven, and digital/AI maturity is low — especially among micro-enterprises.** This shared profile is what makes a single transnational curriculum both feasible and necessary.

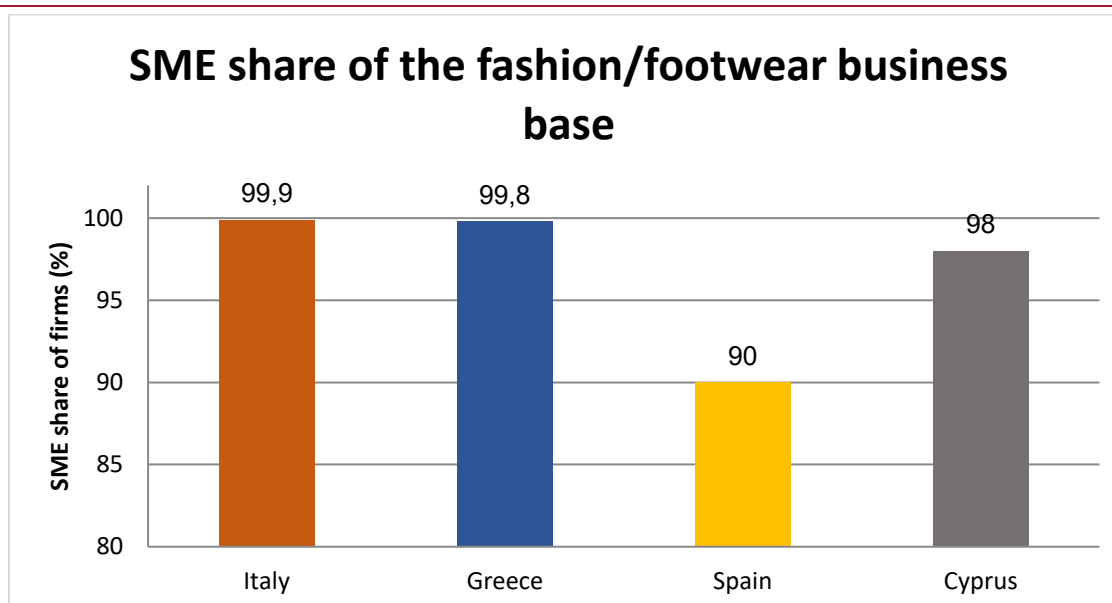


Figure 1. SME share of the fashion/footwear business base across the four partner countries.

Top three common barriers

1. **Financial barriers.** Cost is the single most cited obstacle everywhere: high prices for sustainable materials, and high investment costs for digital and AI tools. Spain (80%), Greece (66.7%), Cyprus and Italy (≈70%) all rank cost first.
2. **Human-capital and skills barriers.** Every country reports a shortage of "hybrid" professionals who combine design, sustainability and digital/AI competences, plus a parallel shortage of trainers able to teach them.
3. **Structural and cultural barriers.** Fragmented supply chains, weak data readiness, limited digital infrastructure, weak VET–industry collaboration, and cultural resistance to change recur across all four datasets.

Key cross-country findings

- Awareness consistently outpaces implementation. SMEs recognise the strategic value of sustainability and AI but cannot yet operationalise them affordably.
- Demand for training and for VET–SME collaboration is strong and remarkably consistent: roughly 67–75% of respondents rate new sustainability skills and collaboration with VET providers as highly important.
- Enterprise AI adoption is rising fast but uneven (2025: Spain 20.3%, Italy 16.4%, Cyprus 9.3%, Greece 8.9%, against an EU27 average of 20.0%), and is lower still inside fashion SMEs, where survey-reported AI familiarity sits below the mid-point of the scale (Eurostat, 2025; Istat, 2025).

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- Focus groups in every country converge on the same message: AI must support — not replace — craft knowledge, and training must be practical, accessible and modular.

Strategic vision: the Design-Smart Competence Framework

To turn these findings into a curriculum, the report proposes a three-level Design-Smart Competence Framework that progresses from shared foundations to applied and strategic capability, fully mapped to GreenComp, DigComp, EQAVET and ECVET:

- **Level 1 – Foundational:** GreenComp and DigComp basics, sustainability literacy and digital literacy.
- **Level 2 – Applied:** eco-design, entry-level AI tools, circular materials and digital prototyping (CAD/3D).
- **Level 3 – Advanced/Strategic:** ESG reporting, circular business models and strategic innovation.

This framework, detailed in the Transnational Training Needs section, is the bridge between the evidence in this report and the curriculum to be designed under SO2.2 and delivered under SO2.3.

Introduction

1. Project Context

The Design-Smart project addresses the urgent need to modernise Vocational Education and Training (VET) within the fashion and footwear industries by weaving together sustainability, circular-economy principles and Artificial Intelligence (AI). It is aligned with the European Union’s priorities for the green and digital transitions, most notably the European Green Deal and the Digital Decade, and enhances the capacity of VET providers to empower Small and Medium-sized Enterprises (SMEs) — with a specific focus on those led by women entrepreneurs — through the adoption of innovative, sustainable and digitally driven business models.

The project is anchored in a converging set of EU policy frameworks. The **European Green Deal** and the **Circular Economy Action Plan** set the direction for circular, low-impact production. The **Eco-design for Sustainable Products Regulation (ESPR)**, which entered into force in July 2024, introduces product-specific eco-design and information requirements — including the Digital Product Passport — that directly affect textiles and footwear. The **Digital Decade** and the **EU Skills Agenda** frame the parallel push on digital capability and lifelong learning. Together these instruments make the fashion and footwear sectors a strategic testing ground for the twin transition.

The fashion and footwear sectors are strategic for three reasons. First, they are among the most resource-intensive and polluting industries in Europe, so improvements in material choice, durability, repairability and circularity yield large environmental gains. Second, they are overwhelmingly composed of SMEs and micro-enterprises that lack the internal capacity to absorb regulatory and technological change without external support. Third, women entrepreneurs are structurally significant across the value chain — particularly in micro-firms, craft production and local value chains — yet they often face weaker access to networks, finance and digital confidence. Supporting SMEs and women entrepreneurs in adopting sustainable and AI-driven practices is therefore both an environmental and an inclusion priority.

2. Purpose of the Transnational Report

While the individual National Reports provided the granular, country-specific foundation, this Transnational Report synthesises their key insights into one comparable picture across Italy, Greece, Spain and Cyprus. By aggregating research across the three core thematic areas — sustainable fashion, AI-driven eco-design and VET digitalisation — it offers a comprehensive overview of the current landscape and identifies the common challenges and opportunities that transcend national borders.

The report has three purposes: to synthesise national findings into a single evidence base; to support the development of the Transnational Sustainable Fashion & AI Curriculum under SO2.2 and VET

capacity building under SO2.3; and to identify shared challenges, opportunities and training needs that a European-wide curriculum must address while remaining adaptable to national realities.

3. Methodology

A robust, harmonised methodology was implemented across the consortium so that national datasets would be comparable. It combined three evidence streams, triangulated to balance breadth, depth and validation:

- **Desk research** using standardised T2.1 templates to analyse national and EU policies, market data, existing initiatives and training provision.
- **Structured questionnaires** (target of 20 per partner country) addressed to SMEs and VET providers, using Likert-scale items to benchmark sustainability practices, AI adoption barriers and training gaps.
- **Focus groups** (at least one per country) engaging VET providers, SMEs and sustainability/industry experts to deepen and contextualise the quantitative findings.
- **Advisory Committee validation** through consultation with national stakeholders, ensuring the identified needs are grounded in local reality.

The triangulation approach — desk research plus field data plus expert validation — ensures that the priorities identified in this report are both evidence-based and operationally relevant. The methodology and comparative framework are described in full in the next section.

Methodology & Comparative Research Framework

1. Research Design

All four partners applied the same research architecture so that results could be compared directly. The design combined a quantitative instrument (the questionnaire), a qualitative instrument (the focus group) and a structured desk-research grid.

Questionnaire structure

Each national questionnaire was organised into two parallel tracks — one for SMEs and one for VET providers — because the two groups face different decisions.

SME items covered the use of sustainable materials, sustainable production practices, supply-chain transparency, responsible sourcing, circular-economy readiness, digital and AI tool use, data readiness, and the importance attached to new skills and to VET collaboration.

VET items covered the integration of sustainability in programmes, digital-tool readiness, staff digital competences, readiness to introduce AI topics, barriers to digital adoption, and collaboration with fashion companies.

Most items used a 1–5 Likert scale, allowing means and high-agreement percentages (ratings of 4–5) to be computed and compared.

Focus-group design

Each country ran at least one focus group with a mix of VET providers, SMEs and industry/technical experts. Sessions followed a semi-structured protocol covering: the understanding of sustainable fashion; barriers to adopting sustainable practices and digital tools; the impact of AI and digitalisation; required sustainability and AI competences; and effective teaching methods and curriculum priorities. The aim was to move beyond general perceptions and capture concrete operational examples.

Desk-research categories

Desk research was grouped into four categories — policy (national and EU regulation), market (sector size, structure, exports, SME and women-led firm data), training (VET provision, ITS/IEK/college offer, digital pedagogy) and technology (digital maturity, AI applications, innovation hubs) — so that each national report populated the same comparative cells.

2. Sample Profile

The combined evidence base draws on questionnaire responses and focus-group participation across the four countries. The table below summarises the harmonised sample. Where a partner reported a slightly different total, the figure from its national report is used; minor variations reflect local response rates rather than methodological differences.

Country	SMEs surveyed	VET providers	Focus group(s)	Sector focus
Italy	22	14	2 focus groups (36 respondents total)	Footwear, leather goods, textiles, apparel
Greece	12	10	1 focus group + interviews (22 responses)	Apparel, textiles, retail, craft/atelier
Spain	~12	~8	1 focus group (~20 responses)	Leather, footwear, textiles, clusters
Cyprus	Desk-led	Desk-led	Stakeholder consultation	Retail/import, craft heritage, repair/reuse

Note: the Cyprus national report is primarily desk-research-based and is complemented by stakeholder consultation rather than a full questionnaire dataset; its quantitative contribution is therefore drawn from national statistics (CYSTAT, Eurostat) and EU adoption indicators rather than from Likert-scale survey means. This is handled transparently in the harmonisation step below.

3. Data Aggregation & Harmonisation

Because partners reported in slightly different formats, four harmonisation steps were applied. First, all Likert means were placed on a common 1–5 scale, and high-agreement percentages were recomputed consistently as the share of respondents rating 4 or 5. Second, differences in regulatory frameworks were handled by mapping every national policy to the corresponding EU instrument (ESPR, CSRD, EPR/Waste Framework Directive, Digital Product Passport, AI Act, DigComp/GreenComp), so that countries are compared against the same European baseline rather than against each other’s national law.

Third, cross-country comparisons were made only where the underlying question was equivalent; where a country lacked a directly comparable figure (notably Cyprus), qualitative evidence and national statistics were substituted and clearly flagged. Fourth, clusters and patterns were identified by looking for findings that recurred in at least three of the four countries — these recurring findings form the backbone of the transnational analysis and of the competence framework.

Given the modest sample sizes, all quantitative findings should be read as directional evidence for programme design rather than as statistically representative measurements of the whole sector. Their value lies in the strong convergence across four independent national datasets.

1. Transnational Landscape: Sustainable Fashion

1.1 Market & Policy Analysis

The four partner countries occupy very different positions in the European fashion value chain, but they operate under an increasingly common EU regulatory umbrella. Italy and Spain are major producers and exporters with strong industrial districts and clusters; Greece is a fragmented, retail-oriented and import-dependent market with a high-quality but technologically lagging production base; and Cyprus is essentially a retail-and-trade system with a small manufacturing footprint and a distinctive heritage-craft niche.

Country	Sector scale & structure	Specialisation	Sustainability maturity
Italy	~62,000 firms; €102.1bn turnover; €69.9bn exports; 99.9% SMEs	Footwear, leather goods, textiles, apparel, eyewear; strong districts	Advanced in luxury/export segment; uneven among micro-firms
Spain	~15,700 fashion SMEs; €23–31bn exports; >90% SMEs	Leather (Catalonia), footwear (Valencia), textile (Galicia)	Growing; cluster-driven; gap between awareness and practice
Greece	Retail sales €2.68bn; exports €590m; 99.8% SMEs	Apparel, textiles, retail; cotton base but imports fabrics	Niche-to-mainstream shift; among most polluting; low recycling
Cyprus	Retail/trade >€737m turnover; tiny manufacturing (273 firms)	Retail/import; craft heritage (Lefkara lace, Fythkiotika weaving)	Early stage; buyer-side levers; high landfill, weak collection

National vs. EU regulation

National policy in all four countries is increasingly defined by EU obligations. Italy operates under its National Strategy for the Circular Economy (2022) and was an early mover on separate textile collection (Legislative Decree 116/2020, effective January 2022). Spain aligns through España Circular 2030 and its 2022 Waste and Contaminated Soils Law. Greece combines a national circular-economy action plan and the Hellenic Recycling Agency (EOAN) with direct EU rules. Cyprus relies on its 2021–2027 Circular Economy Action Plan and on EU market rules that bind importers and retailers. The decisive instruments, however, are European and apply across all four:

EU instrument	Status (2025–2026)	Implication for the four countries
Separate textile collection	Mandatory across EU since 1 Jan 2025	All four must build collection, sorting and reuse capacity
Revised Waste Framework Directive (EPR)	In force 16 Oct 2025	Producer responsibility schemes for textiles being prepared
ESPR + Digital Product Passport	In force July 2024; product rules phasing in	Eco-design and product-information duties for textiles/footwear
CSRD / ESRS reporting	Phasing in for larger firms	Cascades data demands down to SME suppliers
Right to Repair Directive	Member-State application from 31 Jul 2026	Raises durability and repairability expectations

Emerging trends are shared across the consortium: **supply-chain transparency** (driven by ESPR, CSRD and the Digital Product Passport), **material innovation** (recycled fibres in Greece and Italy, bio-based and collagen-valorisation materials in Spain), and **circular business models** (resale, repair and take-back, particularly relevant to Greece’s and Cyprus’s micro-enterprise retail structure).

1.2 Skill Gap Analysis

Across the four national reports the same families of competence gaps recur, even though the relative emphasis differs by country. The desk research and questionnaires converge on five priority skill areas where SMEs, designers and VET providers report the largest gaps.

Skill area	Nature of the gap (cross-country)	Strongest signals
LCA & environmental impact assessment	Limited ability to use life-cycle thinking, carbon and water-footprint indicators and impact tools	Italy (70–75% need stronger LCA skills); Greece (46% low familiarity); Spain (60% struggle to link tools to metrics)
Material sustainability & recycling	Insufficient knowledge of low-impact materials, recycled content, mono-materials and trade-offs	All four; acute in Greece (imported fabrics) and Cyprus (import-led)

Skill area	Nature of the gap (cross-country)	Strongest signals
Eco-design & circular design	Weak design-for-durability, repairability and disassembly capability	Italy, Spain (75% identify as critical), Cyprus (craft/repair focus)
Supply-chain traceability	Limited supplier mapping, chain-of-custody and Digital Product Passport readiness	Spain (64%), Italy, Cyprus (product-data gap), Greece (data readiness 3.0/5)
Ethical sourcing & compliance	Gaps in sustainability reporting, ESG communication and avoiding greenwashing	Spain (CSRD 60%), Italy, Greece (value-communication gap)

The cross-cutting theme is that awareness is high but operational, tool-level capability is low. Respondents do not need to be convinced that sustainability matters; they need affordable, practical, hands-on competence to act on it — a finding that directly shapes the curriculum design later in this report.

1.3 Barriers to Implementation

Clustering the barriers reported in the four countries produces a consistent four-part structure. The relative ranking is remarkably stable: financial barriers lead everywhere, followed by human-capital, structural and technical barriers.

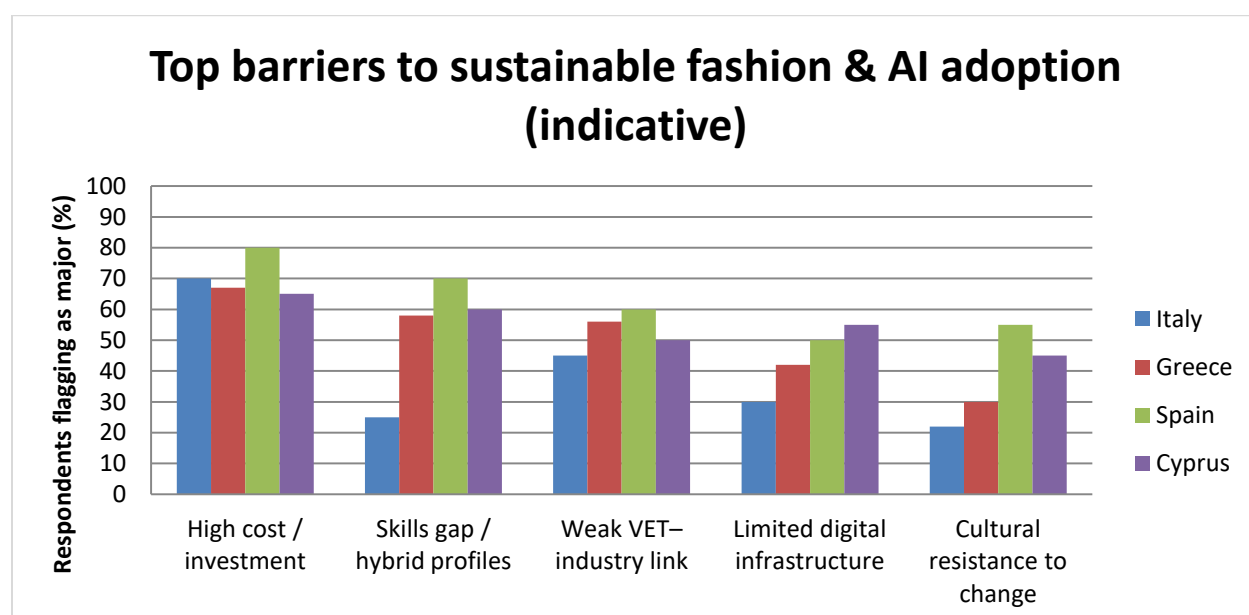


Figure 2. Top barriers to sustainable fashion and AI adoption, share of respondents flagging each as a major obstacle (national questionnaire results; Cyprus values estimated from desk evidence).

Cluster	What it covers across the four countries
Financial	High cost of sustainable materials and certification; high investment cost of digital/AI tools; tight SME margins. Cited first in every country: Spain 80%, Italy ~70%, Greece 66.7%, Cyprus high.
Cultural	Low consumer awareness and willingness to pay; resistance to change in traditional/craft firms; perception of AI as a threat to identity. Strong in Spain, Greece and Cyprus.
Structural	Fragmented supply chains; weak data readiness; limited local sourcing; weak VET–industry links; high import dependence (Greece, Cyprus).
Technical	Lack of tools, software, infrastructure and laboratories; shortage of hybrid design–digital–sustainability profiles and of trainers able to teach them.

1.4 Best Practices

Each national report identified transferable best practices. The cases below illustrate complementary models — industrial circularity, social enterprise, cluster innovation and public collection infrastructure — that together give the curriculum a rich set of real, replicable references.

Italy

- **Retex.Green** (Confindustria Moda / Fondazione del Tessile Italiano) — a national producer consortium operationalising textile circularity and EPR. Transferable because it shows circularity as a governance and collaboration challenge, not only a materials one.
- **Rifò** (Prato) — a certified B-Corp producing garments from recycled fibres within a short local supply chain, combining circular design with local economic development and craft preservation.

Spain

- **Leather Cluster Barcelona (LCB) ecosystem** — a cluster bringing together SMEs, tanneries, technology providers and researchers around traceability (TOKEN), Digital Product Passport implementation and collagen-valorisation (ReGrasPro). Transferable for its education–industry collaboration model and TRL 6–7 real case studies.
- **LaGaspar** (Escola Municipal d’Art i Disseny) — a practice-based design-education model integrating CAD/3D, simulation and industry projects.

Greece

- **SOFFA — The Nest Social Fashion Factory** — a social cooperative crafting sustainable garments while supporting the work integration of women survivors of violence; a powerful model linking sustainability with the project's gender-inclusion goals.
- **DigiFashTech / PANSiK** — a challenge-based model combining policy literacy, sustainability literacy, digital experimentation and industry collaboration through hackathons and mentoring.

Cyprus

- **Green Kiosks under LIFE-IP CYzero WASTE** (Department of Environment) — local sorting points enabling separate collection and reuse of clothing and footwear, including in remote areas; a replicable public-collection and quality-control-at-source model.
- **Cyprus Handicraft Service training programmes** — 700-hour vocational programmes in embroidery and weaving that sustain heritage textile skills, repair capability and durable, locally made products.

Common enabling factors emerge clearly: close employer/industry involvement, a cluster or consortium that aggregates services for small firms, practical hands-on learning with real case studies, and public-policy or funding support. These four enablers are precisely the design principles carried into the DesignSmart curriculum recommendations.

2. AI-Driven Eco-Design: Maturity & Barriers

This section assesses the digital readiness of the four fashion ecosystems and the barriers that slow AI adoption. The picture is consistent: enabling policy and infrastructure are improving everywhere, but real adoption inside fashion SMEs remains early-stage, constrained by cost, data readiness and a shortage of hybrid skills.

2.1 Digital Readiness Metric

Synthesising the qualitative and quantitative evidence from each national report across five readiness dimensions — IT infrastructure, data culture, budget for digitalisation, AI awareness and skills availability — produces the comparative profile below. The scores are indicative (1–5) and are intended to show relative shape rather than precise measurement.

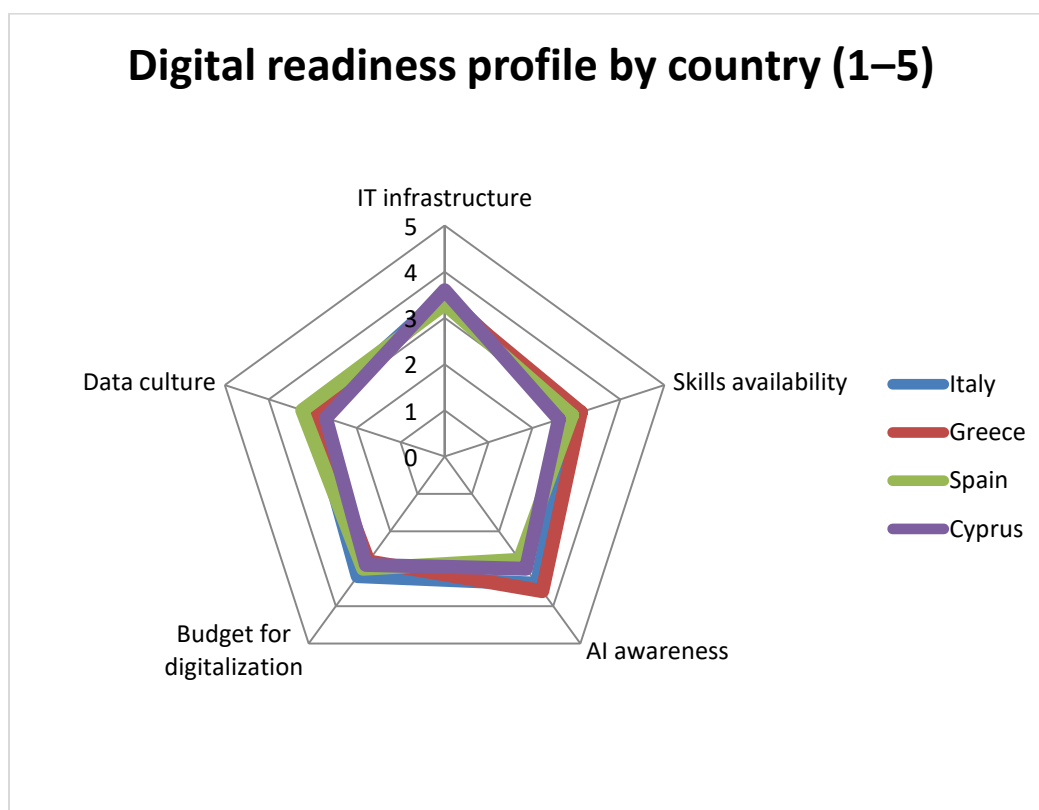


Figure 3. Digital readiness profile by country across five dimensions (1–5 indicative scale, synthesised from national reports).

Two patterns stand out. First, IT infrastructure and AI awareness are relatively the strongest dimensions everywhere — the policy and connectivity environment is broadly in place. Second, data culture, budget and skills availability are the weakest dimensions in all four countries, confirming that the binding constraint is organisational and human, not infrastructural. Cyprus shows

comparatively strong connectivity but the weakest data culture and skills base; Spain shows the lowest AI awareness inside SMEs; Greece and Italy sit in between.

Self-reported maturity (survey evidence)

Where countries collected comparable Likert data, SME self-assessment of AI familiarity, digital-tool use and data readiness all cluster around or below the mid-point of the scale, underlining the early stage of adoption.

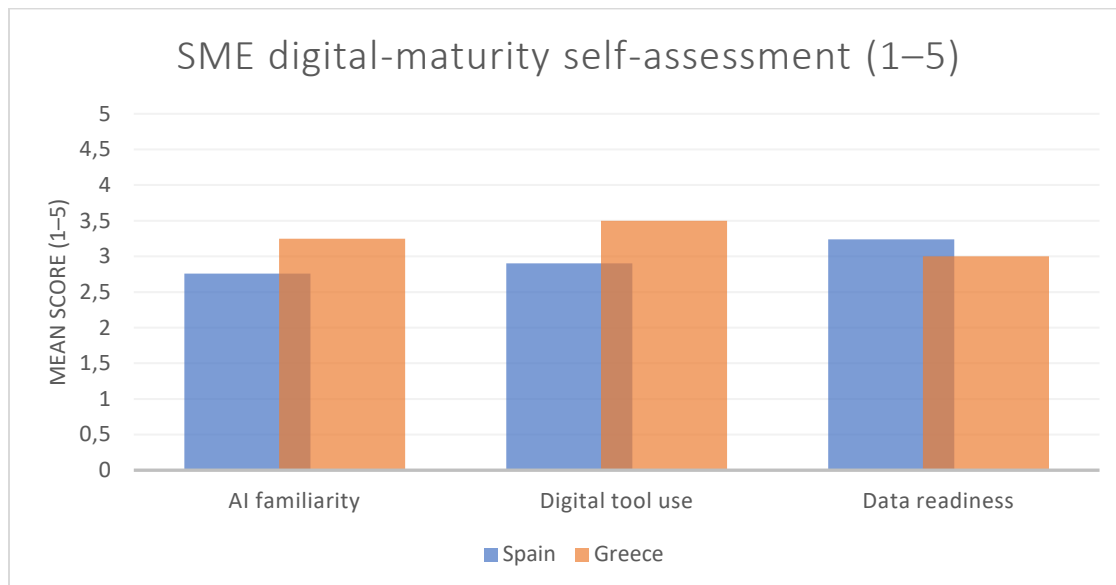


Figure 4. SME digital-maturity self-assessment, mean scores on a 1–5 scale (Spain and Greece survey data).

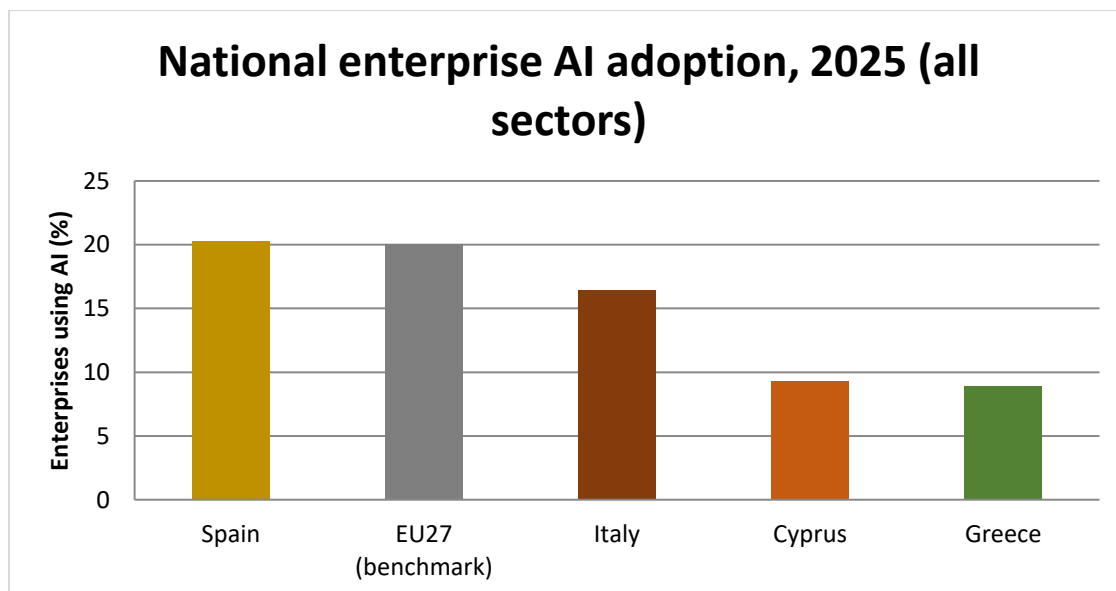


Figure 5. National enterprise AI adoption, 2025 — share of enterprises (10+ employees) using AI, all sectors. Sources: Eurostat ICT Enterprise Survey (isoc_eb_ai, 2025); Istat (Italy); INE (Spain). Fashion-SME adoption is lower than these national averages.

At national, all-sector level, enterprise AI adoption is rising fast but remains uneven across the four countries. On the latest Eurostat reference year (2025), Spain stands at 20.3% and Italy at 16.4%, while Cyprus (9.3%) and Greece (8.9%) sit well below the EU27 average of 20.0%. The trajectory is steep: Italy roughly doubled from 8.2% (2024) to 16.4% (2025), and Spain rose from 11.3% to 20.3% over the same period, whereas Greece edged down from the 9.8% recorded in 2024. Inside fashion SMEs the figures are lower still in every country, because micro-firms lack the skills, time and data infrastructure to deploy AI even where tools are available — the same divide between structured, innovation-oriented firms and the long tail of micro-enterprises appears in all four national datasets (Eurostat, 2025; Istat, 2025).

2.2 AI Adoption Barriers

The barriers to AI adoption cluster into three categories that recur in every national report.

Category	Barriers reported across the four countries
Technological	High cost of software, hardware and infrastructure (Spain 67%, Italy ~35% rank it first, Greece and Cyprus high); difficulty selecting the right tools; interoperability and legacy-system constraints; limited access to advanced tools for micro-firms (Cyprus).
Systemic	Lack of standards and regulatory clarity (IP, data protection, accountability for claims — strong in Cyprus); data fragmentation and weak data readiness (Greece 3.0/5; Spain 3.24/5); limited targeted VET provision in all four.
Human	Shortage of hybrid designer–digital–sustainability profiles (Spain ~70%, Greece, Italy ~25% rank it a major limit, Cyprus); low digital confidence; cultural resistance to change, especially in traditional/craft firms.

A distinctive cross-country nuance from the focus groups is that resistance is less ideological than practical: firms are not opposed to AI in principle, but they lack the data, the time and the in-house capability to integrate it into everyday decisions. The recurring message — voiced almost identically in Italy, Greece and Spain — is that AI must support rather than replace craft knowledge and human creativity.

2.3 AI-Supported Sustainability Metrics

A specific sub-question is how far firms can use AI to support sustainability outcomes rather than only speed and sales. The evidence shows real but unevenly distributed capability, concentrated in clusters, hubs and innovation-oriented firms.

AI-supported capability	State across the four countries
Carbon-footprint estimation / LCA support	Emerging; Spain develops AI-assisted material-impact prediction in clusters; Greece reports 46% low familiarity with environmental AI tools; Italy 62% limited familiarity with LCA/footprint software
Material scoring & comparison	Spain (LCB AI-based leather classification — "Leather Eyes" — for defect detection and waste reduction) is the clearest production-grade case; Cyprus via DiGiNN test-before-invest
Supply-chain traceability	Driven by Digital Product Passport readiness; Spain (TOKEN traceability) leads; Cyprus product-data structuring; Italy (MICS digital twin) links design, materials and lifecycle data
Predictive analytics for waste reduction	Italy (MICS digital twin for logistics/waste optimisation) and Spain (3D virtual prototyping, digital twins) most advanced; Greece and Cyprus mainly demand forecasting and stock planning in retail

Two best-practice cases anchor this area for the curriculum. Italy's MICS digital-twin project demonstrates how 2D-to-3D conversion, materials-data integration and predictive logistics can be combined for sustainability outcomes and taught through case-based exercises even without advanced on-site AI. Spain's LCB "Leather Eyes" system shows machine-vision AI applied to a traditional process (leather grading) to cut waste — a vivid, transferable example of AI delivering circular-economy value in a low-tech sector. Both reinforce the same curriculum lesson: teach AI through concrete industrial use cases, not abstract theory.

3. VET Digitalization: Capacity Building

This section evaluates how ready the four VET systems are to support the digital and sustainable transition. All four are progressing — driven by Recovery and Resilience Facility investment and EU competence frameworks — but integration is uneven, the trainer skills base is the critical bottleneck, and digital collaboration with industry is the weakest dimension everywhere.

3.1 Digital Pedagogies

Learning Management Systems and blended/hybrid delivery are now standard across the four VET systems, accelerated by the pandemic and sustained by national investment. Beyond that baseline, however, the depth of digital pedagogy varies considerably.

Country	LMS / digital delivery	Sustainability & AI integration	Key constraint
Italy	Scuola 4.0 (PNRR) funds ~100,000 digital classrooms; ITS Academies strong	10 ITS Academies in "Sistema moda"; 3D design and sustainability management offered	Uneven across regions; trainer hybrid skills
Greece	Strong post-pandemic LMS use; RRF VET Platform & EOPPEP digitalisation	Open to AI content (4.19/5 readiness) but practical integration inconsistent	VET–industry link weakest (3.0/5)
Spain	LMS and hybrid widespread; often limited to content delivery	CAD/3D introduced but not systematic; digital pedagogy limited	Depth and specialisation lacking
Cyprus	Moodle-based; CPI digital-competence programme to 2026; HRDA portal	AI/VR pilots (EULEP, CHAT2LEARN, CYENS); not yet daily practice	Scale, coverage, trainer hands-on skills

The common pattern is a solid infrastructural and policy baseline (platforms, connectivity, EU-aligned frameworks such as DigComp and DigCompEdu) coexisting with shallow pedagogical integration: digital tools are often used to deliver content rather than to enable simulation, project-based learning or AI-supported activity. Greece quantifies this well — readiness to integrate digital tools scores 3.94/5 and staff digital competences 4.12/5, yet practical CAD/3D, simulation and AI activity remains inconsistent.

3.2 The Trainer Paradox

The single most consistent VET finding across the consortium is what can be called the trainer paradox: trainers possess strong fashion, craft and sector expertise but low confidence and

capability in AI and advanced digital tools. The shortage of trainers who combine both is reported as a barrier in every country.

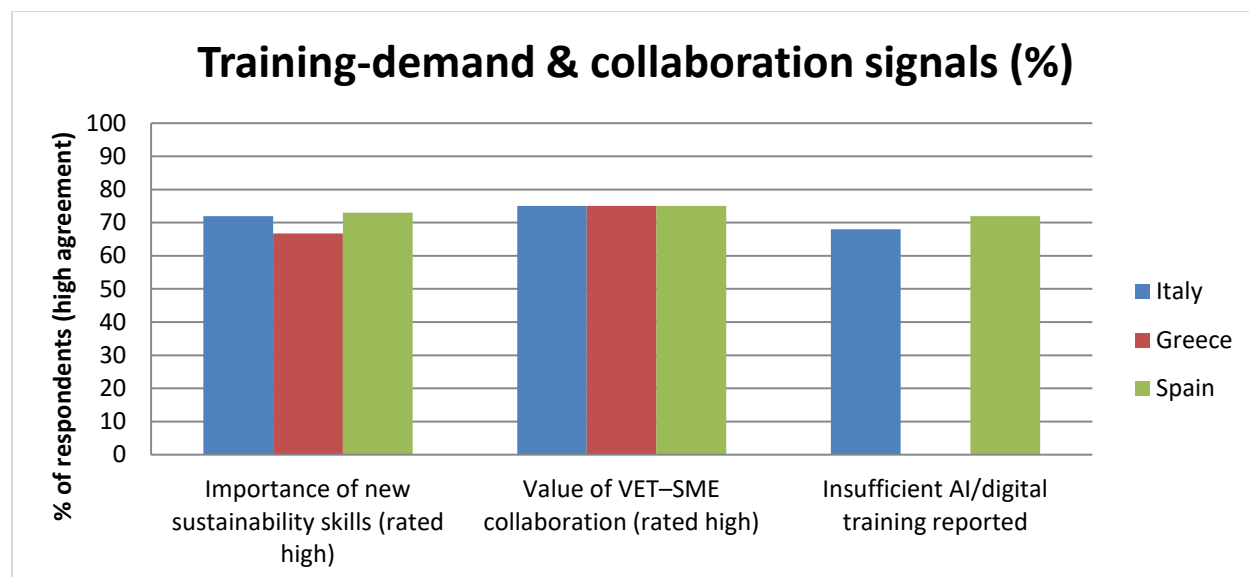


Figure 6. Training-demand and collaboration signals across countries: importance of new sustainability skills, value of VET-SME collaboration, and reported insufficiency of AI/digital training (share of respondents in high agreement).

The evidence is striking in its consistency. In Greece, most respondents — roughly two-thirds to four-fifths across the VET indicators (digital-tool readiness 68.8% rated 4–5, staff competences 81.2%, AI-topic readiness 75.0%) — point to the need for stronger, sector-specific digital skills among trainers and staff, while generic digital literacy already scores relatively well; the gap is specialised capability. In Italy, ~72% identify significant skills gaps and trainer upskilling is named an explicit priority. In Spain, around 72% report insufficient AI-related training and teacher digital competence is rated only moderate (3/5). In Cyprus, the national teacher digital-competence programme runs to 2026 precisely because continuous professional development remains a recognised need.

Three identified needs follow directly from this paradox and are shared across all four countries:

- **Train-the-trainer programmes** focused on sector-specific digital and AI tools (CAD/3D, simulation, entry-level AI, environmental-impact tools), not generic digital literacy.
- **Digital-literacy reinforcement** embedded in continuous professional development, so trainers can move from using tools for content delivery to designing blended, project-based learning.
- **Co-teaching with technology experts** and with industry, pairing strong craft/fashion knowledge with digital capability rather than expecting every trainer to master both alone.

3.3 VET-SME Collaboration Models

Digital collaboration between VET providers and companies is the weakest dimension in every national dataset — Greece scores it lowest of all its indicators (3.0/5, with 56.3% rating it only 1–3), Spain rates it moderate (~3/5), and Cyprus describes it as a labour-market link rather than a full digital work-based-learning ecosystem. Yet demand for collaboration is simultaneously very high (around 75% rate it important in Italy, Greece and Spain alike), making this the clearest single opportunity for DesignSmart. Four collaboration models, each evidenced in at least one country, are recommended:

Model	Description and country evidence
Dual / work-based training	Close employer involvement, internships and demonstrable outputs — exemplified by Italy's ITS Academy model (≥35% workplace training) and Spain's cluster-based training.
Virtual apprenticeships	Remote, platform-mediated work placements — explicitly identified as underdeveloped in Greece and Cyprus and valuable for women entrepreneurs and remote areas.
VET labs as "Digital Sandboxes"	Shared access to CAD/3D, prototyping and AI tools — Cyprus's CYENS Thinker Maker Space and DiGiNN "test-before-invest" model; Italy's ITS laboratories.
Co-creation models	Curricula and modules co-designed with SMEs around real company briefs — Greece's DigiFashTech challenge-based model and Spain's LaGaspar industry-linked projects.

The transferable conclusion is that VET digital transformation works best when platforms, content, trainer support and labour-market relevance are developed together — as demonstrated by Greece's RRF-backed VET Platform and EOPPEP digitalisation, and by Italy's integrated ITS ecosystem.

4. Transnational Training Needs Framework

The convergent evidence from the four countries is translated here into a competence model and curriculum structure. The model deliberately mirrors the shared reality identified in the previous sections: high awareness, low operational capability, micro-enterprise constraints, and strong demand for practical, accessible, modular training.

4.1 The Design-Smart Competence Model

The framework is structured into three progressive levels, allowing learners with very different starting points — from craft artisans to design graduates — to enter at the appropriate stage and build capability gradually. Each level is mapped to the relevant EU competence frameworks (GreenComp for sustainability, DigComp/DigCompEdu for digital, EQAVET for quality, ECVET for credit/recognition).

The Design-Smart Competence Model

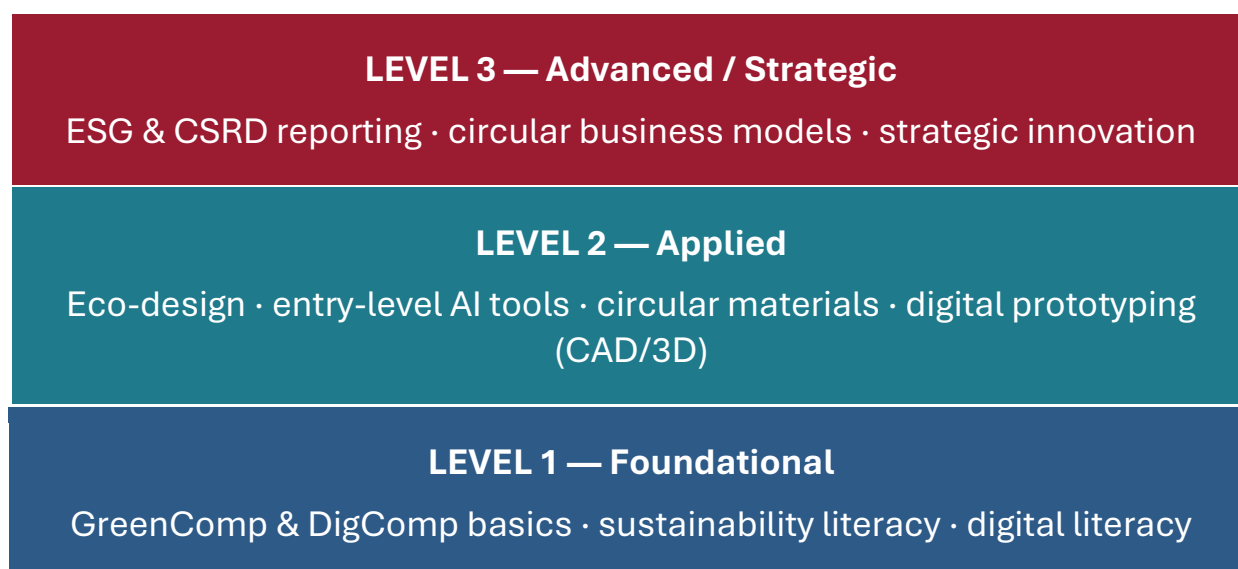


Figure 7. The three-level Design-Smart Competence Model.

Level	Competences	Cross-country rationale	EU mapping
Level 1 Foundational	Sustainability basics, circular-economy literacy, digital literacy, AI awareness, data basics	Addresses the awareness-to-practice gap and weak data culture found in all four countries	GreenComp, DigComp

Level	Competences	Cross-country rationale	EU mapping
Level 2 Applied	Eco-design & design-for-durability, entry-level AI tools, circular materials, CAD/3D & digital prototyping, traceability & product data	Targets the hybrid-skills shortage and the practical, tool-level gaps that dominate the evidence	GreenComp, DigComp, ECVET
Level 3 Advanced / Strategic	ESG & CSRD reporting, circular business models, supply-chain strategy, AI-supported decision-making, strategic innovation	Serves export-oriented and growth firms (Italy, Spain) and prepares SMEs for ESPR/DPP compliance	GreenComp, EQAVET

The priority training areas that populate these levels are the direct intersection of the four national reports: (1) sustainable fashion and eco-design; (2) environmental assessment and sustainability metrics; (3) traceability, transparency and compliance; (4) digital and AI-enabled product development; and (5) digital pedagogy and trainer upskilling. Every one of these areas was independently flagged as a priority in at least three of the four countries.

4.2 Gender-Inclusive Training Needs

Women entrepreneurs are central to the DesignSmart target group and are structurally significant in the partner countries — in Italy, women-led firms account for 22.2% of all enterprises (over 1.3 million firms); in Spain, 37.7% of sole-proprietor businesses are women-led; in Greece and Cyprus, women are strongly represented in craft, atelier and micro-retail activity. The national reports — especially Greece — highlight that women-led and very small firms face specific barriers: weaker access to networks, time constraints, funding barriers and lower digital confidence. Greece’s SOFFA best practice shows fashion training used explicitly as a vehicle for women’s social and economic inclusion.

The curriculum addresses these barriers along four dimensions:

- **Access to networks:** cluster- and consortium-based delivery (LCB, ITS networks, DigiFashTech) that connects women entrepreneurs to peers, mentors and industry.
- **Flexible learning:** modular, blended and hybrid formats — including virtual and remote options — that fit the time constraints of micro-firm owners and respond to Greece’s and Cyprus’s remote-area needs.

- **Mentoring:** structured mentoring and "translation skills" support, turning regulatory and sustainability concepts into manageable, business-relevant practice.
- **Digital confidence:** low-threshold, inclusive entry points to digital and AI tools, presented clearly for learners without a strong technical background — a need stressed in every focus group.

4.3 Curriculum Structure Recommendation

The recommended curriculum is a modular, practice-oriented programme that progressively integrates sustainability, circularity and digital innovation, moving from foundational concepts to applied tasks and on to strategic capability. It is structured into seven modules that operationalise the five transnational priority training areas identified above and are mapped to the relevant EU competence frameworks (GreenComp, DigComp/DigCompEdu, EQAVET, ECVET). Delivery prioritises real use cases, company briefs and demonstrable outputs, with depth over breadth — mastering two or three relevant tools well rather than many superficially.

Module	Learning outcomes	Suggested duration	Assessment
M1. Sustainable Fashion Foundations and Lifecycle Thinking	Explain sustainable and circular fashion principles; apply life-cycle thinking; identify environmental hotspots (water, chemicals, microfibres, carbon) across the value chain.	15–20 h (Level 1)	Knowledge quiz + short lifecycle-mapping exercise
M2. Sustainable Materials and Responsible Sourcing	Evaluate low-impact, recycled and mono-materials and their trade-offs; apply responsible and ethical sourcing; map suppliers and request minimum sustainability data.	15 h (Level 1–2)	Material-selection case + supplier-mapping task
M3. Practical Circular Economy Applications in Fashion	Apply design-for-durability, repairability and recyclability; build reuse, repair and take-back approaches; understand EPR and end-of-life obligations.	15–20 h (Level 2)	Circular product / redesign brief

Module	Learning outcomes	Suggested duration	Assessment
M4. Digital Tools for Eco-Design: CAD, 3D and Virtual Prototyping	Use CAD, 3D modelling and virtual prototyping to reduce physical samples, optimise material use and accelerate sustainable design iteration.	20–25 h (Level 2)	Digital prototype portfolio
M5. Decision-making using Artificial Intelligence and Data Analytics in Sustainable Fashion	Use entry-level AI tools and prompting; apply data literacy; interpret AI-supported sustainability metrics (LCA outputs, material scoring, traceability); apply responsible and ethical AI use.	20 h (Level 2–3)	AI-supported decision log / case analysis
M6. Sustainable Business Strategies and Regulatory Readiness	Develop circular business models; grasp ESG/CSRD reporting basics; prepare for ESPR, Digital Product Passport and EPR requirements; recognise and avoid greenwashing.	15 h (Level 3)	Business-model canvas + compliance checklist
M7. Marketing, Communication, and Collaboration for Sustainable Innovation	Communicate sustainability credibly to customers and stakeholders; build responsible-sourcing narratives and green-marketing strategies; collaborate digitally with VET providers and SMEs.	15 h (Level 2–3)	Sustainability communication / collaboration plan

Indicative total volume: approximately 115–130 hours, deliverable as a full programme or as stand-alone micro-credentials. The sequence follows the three-level competence model: M1–M2 are predominantly foundational, M3–M5 applied, and M6–M7 advanced/strategic, allowing learners with different starting points — from craft artisans to design graduates — to enter at the appropriate stage and build capability gradually.

Mapping to priority training areas: M1 and M2 cover sustainable fashion, eco-design and environmental assessment; M3 covers circular-economy application; M4 and M5 cover digital and AI-enabled product development; M6 covers traceability, compliance and circular business strategy; and M7 responds to the communication and market-competence needs flagged across the

national reports (notably Italy and Greece). Together the seven modules address all five priority areas identified in Section 4.1.

Parallel trainer-upskilling strand: in line with the "trainer paradox" identified in Section 3.2, a dedicated trainer-development strand (digital pedagogy, blended and project-based delivery, and co-teaching with technology and industry experts) runs alongside the seven learner modules rather than as a numbered module, ensuring trainers can deliver the programme effectively.

5. Strategic Recommendations & Policy Insights

The transnational evidence translates into actionable recommendations at three levels. Each recommendation responds directly to a barrier or opportunity identified consistently across Italy, Greece, Spain and Cyprus.

5.1 Policy Level

- **Promote micro-credentials** for sustainable-fashion and AI competences, EQAVET/ECVET-aligned, so that the short, modular training the evidence demands carries recognised value and stacks toward qualifications.
- **Support DPP and ESPR implementation** with SME-facing guidance and templates, since traceability and product-data readiness are weak in all four countries and compliance deadlines are approaching.
- **Incentivise SME digitalisation** by channelling existing instruments (Italy's Transition 5.0, Spain's Digital Kit, Greece's Digital Transformation programme, Cyprus's THALIA/RRP schemes) toward fashion-specific, low-threshold AI and circular tools.

5.2 SME Level

- **Adopt a technology-adoption roadmap** that starts from structured product data and basic digital tools before advancing to AI — directly addressing the weak data-readiness finding common to all four countries.
- **Use low-cost, accessible AI tools** and "test-before-invest" facilities (e.g. Cyprus's DiGiNN, Italy's digital innovation hubs) to lower the cost barrier ranked first everywhere.
- **Build partnerships with VET institutions** and clusters to access shared labs, real case studies and co-designed training — turning the strong, unmet demand for VET-SME collaboration into practice.

5.3 VET Level

- **Establish digital-lab sharing** ("digital sandboxes") so smaller providers and SMEs can access CAD/3D, prototyping and AI tools without prohibitive individual investment.
- **Run train-the-trainer programmes** focused on sector-specific digital and AI capability and digital pedagogy — the single most consistent VET need across the consortium (the trainer paradox).
- **Deliver standardised, EU-aligned modules** built on the three-level competence model, ensuring transferability across the four countries while allowing national adaptation.

Conclusion

Read together, the four national reports tell a single, coherent story. The fashion and footwear ecosystems of Italy, Greece, Spain and Cyprus differ greatly in scale — from Italy's €102 billion production system to Cyprus's import-led retail economy — yet they share the same structural profile: they are built on micro and small enterprises, they recognise the strategic importance of sustainability and AI, and they are constrained by the same trio of barriers: cost, a shortage of hybrid skills, and weak data and collaboration structures. This convergence is the central transnational insight, and it is what makes a shared curriculum both possible and worthwhile.

Key transnational insights

- Awareness consistently outpaces implementation; the binding constraint is affordable, practical, tool-level capability, not motivation.
- Cost is the universal first barrier; hybrid skills shortages and weak data readiness are the universal enablers that must be built.
- Demand for training and for VET–SME collaboration is strong and consistent (≈67–75% rate it highly important), while actual digital collaboration is the weakest link — the clearest opportunity for intervention.
- AI is welcomed as a tool that must support, not replace, craft knowledge — a principle voiced almost identically in every focus group.

Implications for curriculum development

The evidence points unambiguously to a modular, practice-oriented, EU-aligned curriculum structured around the three-level Design-Smart Competence Model, delivered through real company briefs, accessible tools and blended formats, and supported by a dedicated trainer-upskilling strand. Teaching AI through concrete industrial use cases — Italy's MICS digital twin, Spain's "Leather Eyes", Greece's DigiFashTech, Cyprus's digital-sandbox model — will be far more effective than abstract instruction.

VET–SME collaboration and women entrepreneurs

Strengthening VET–SME collaboration is the highest-leverage action available to the consortium: it is simultaneously the most demanded and the least developed dimension. Embedding women entrepreneurs at the centre of this collaboration — through flexible learning, mentoring, network access and digital-confidence building — turns an inclusion priority into a driver of sustainable innovation, as Greece's SOFFA model vividly demonstrates.

Vision for the future of the sector

The vision that emerges is of a fashion and footwear sector in which sustainability and digitalisation are not separate, abstract aspirations but integrated, everyday business practice — where a micro-enterprise can structure its product data, reduce physical sampling through digital rendering, choose lower-impact materials with confidence, and meet ESPR and Digital Product Passport requirements without prohibitive cost.

By equipping VET providers, SMEs and women entrepreneurs across Italy, Greece, Spain and Cyprus with a common, practical and adaptable set of competences, DesignSmart can help make the twin transition real for the very firms that form the backbone of European fashion.

References & Sources

This report synthesises the four DesignSmart national reports together with external statistical sources. Figures and numbers fall into three provenance categories, indicated where relevant in the text: (i) external official statistics, with direct links below; (ii) values drawn from the national reports (which carry the project's own questionnaire and focus-group data); and (iii) indicative author estimates used only for cross-country comparison. The accompanying figure-data workbook documents the provenance of every individual figure value.

National reports (DesignSmart, T2.1/T2.2)

- **Italy** — Politecnico Calzaturiero and Base3 (2026). National Report: Italy. Questionnaire (36 respondents) and two focus groups.
- **Greece** — EUROTraining and PlanB (2026). National Report: Greece. Questionnaire (22 responses) and focus group.
- **Spain** — CCIB and Leather Cluster Barcelona (2026). National Report: Spain. Questionnaire (≈20 responses) and focus group.
- **Cyprus** — People Forward (2026). National Report: Cyprus. Desk research and stakeholder consultation (no questionnaire dataset).

External statistical sources (with links)

- Eurostat — Use of artificial intelligence in enterprises, 2025 reference year: ec.europa.eu/eurostat/.../ddn-20251211-2. Underlying dataset isoc_eb_ai: Eurostat data browser. (Figure 5; Greece 8.9%, Cyprus 9.3%, EU27 20.0%.)
- Eurostat — AI in enterprises, 2024 reference year: ec.europa.eu/eurostat/.../ddn-20250123-3; and Digital economy and society statistics: [statistics-explained](https://statistics-explained.eu).
- Istat — Imprese e ICT (Italy), 2024 (8.2%) and 2025 (16.4%): istat.it 2024 | istat.it 2025. (Figure 5, Italy.)
- European Commission — SME Performance Review / SME Country Fact Sheets 2025: single-market-economy.ec.europa.eu. (Figure 1, SME shares.)
- MAECI — Il sistema moda italiano (2025): esteri.it WP_moda. (Table 1, Italian sector indicators.)
- INDIRE — ITS Academy monitoraggio 2024, Sistema moda: indire.it. (Section 3, Italian ITS Academies.)
- Spain women-led firms (37.7%) and fashion SMEs: INE/DIRCE and Observatorio del Textil y la Moda / Modaes, via the Spain national report. Greece sector data: ΣΕΠΠΕ / ΙΜΕ ΓΣΕΒΕΕ (Lamprinidis, 2023), via the Greece national report. Cyprus sector data: CYPSTAT and Eurostat, via the Cyprus national report.

EU frameworks referenced

European Green Deal; Circular Economy Action Plan; Ecodesign for Sustainable Products Regulation (Regulation (EU) 2024/1781); revised Waste Framework Directive (2025); CSRD/ESRS; Right to Repair Directive (EU) 2024/1799; AI Act; GreenComp; DigComp and DigCompEdu; EQAVET; ECVET.

Note on figures: Figure 5 uses Eurostat/Istat/INE official statistics (linked above). Figures 2 and 3 are indicative comparative syntheses rather than direct survey values, and a small number of values in Figures 1, 4 and 6 are author estimates; the survey-based values in Figures 4 and 6 derive from the partner questionnaires reported in the national reports. Full per-value provenance is provided in the companion figure-data workbook.