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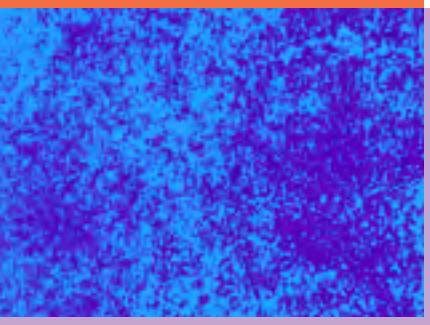
Western Balkans Creative Economy Skills Initiative

Research Synthesis and Vocational & Educational Training Framework Implications





THE FIFTH SECTOR



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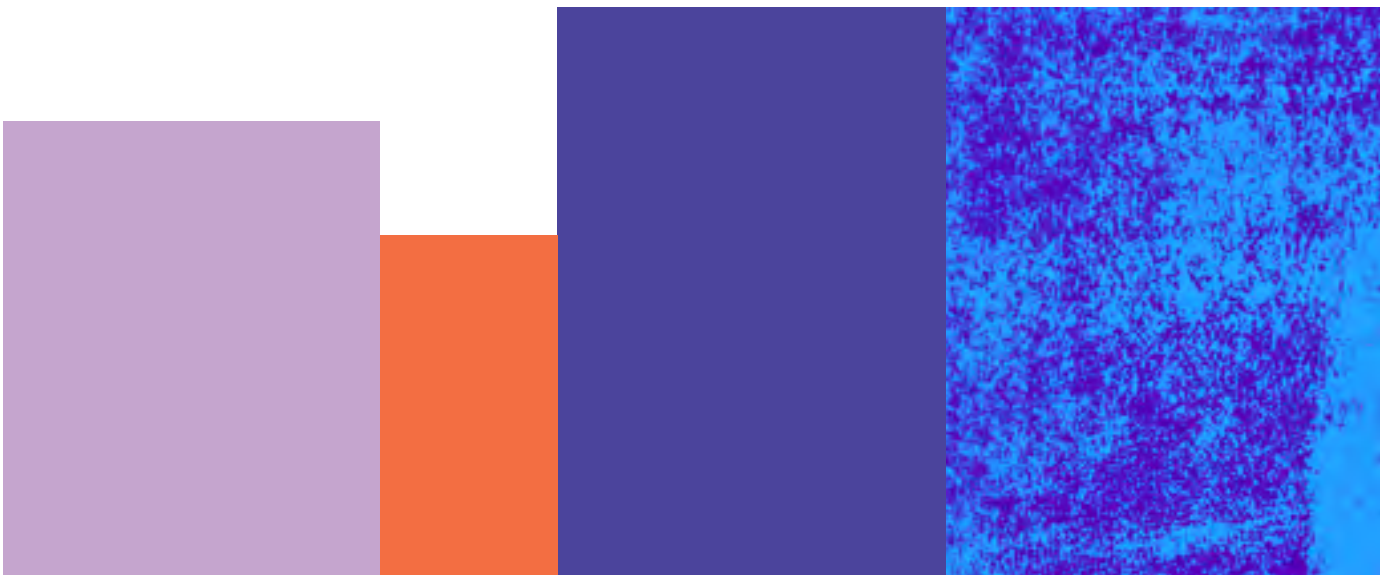
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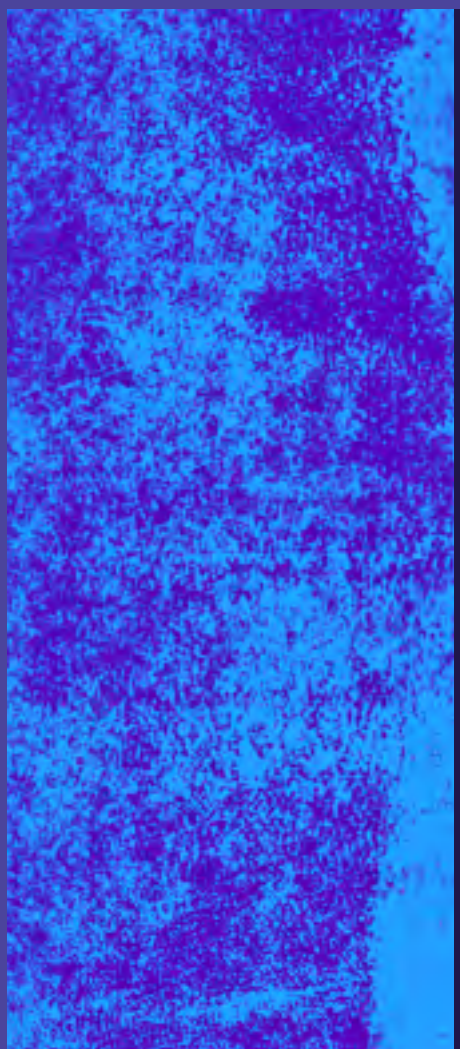
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Research Findings Analysis



1. The Emerging Research Picture

1.1 Decisions Shaping This Document

Two critical methodological decisions have shaped the scope and framing of this document, driven by real-time pressure on the research timeline. Both are recorded here transparently so that stakeholders and future contributors can understand the boundaries of what is and is not claimed.

Decision 1: ESCO coding scope has been narrowed

The research will not produce a full set of ESCO codes for all activities. Instead, it will indicate pathways that the ESCO coding derived from findings suggests we can pursue. The March 2026 dissemination will not present a finished taxonomy but a directional framework: a set of evidence-based recommendations about where the taxonomy should go, not the taxonomy itself.

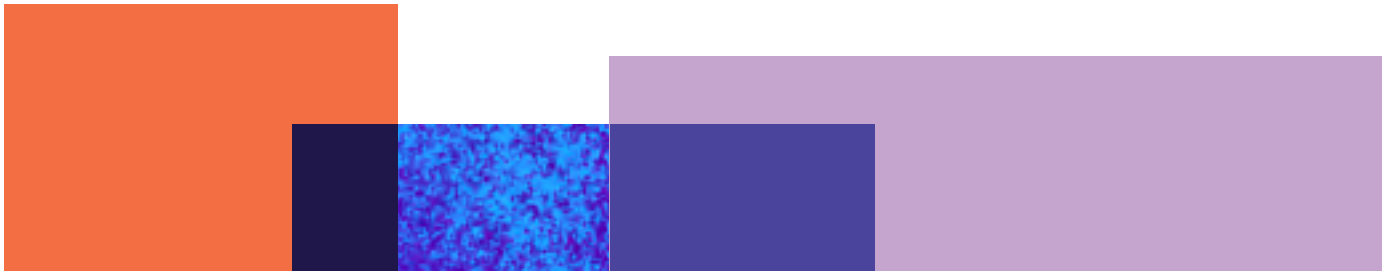
Decision 2: NQF analysis is bounded

The NQF documents, combined with the employer research, do allow meaningful differentiated recommendations; but there is not enough information to say anything definitive about NQFs beyond the fact that they are in different states of development. The dissemination must stress that we cannot impose changes on existing NQFs – our role is to generate evidence and make recommendations to the bodies empowered to act.

1.2 Taxonomy framing: confirmed approach

ESCO is the right anchor but requires substantial extension for games, VFX and animation. The key points to carry forward are:

- The recommendation is to use ESCO as an anchor rather than building bespoke frameworks; scope narrowing is a recurring pattern in this type of work.
- Our working methodology is a hybrid approach: occupation-based anchors, skills-based detail, practitioner input for currency.
- The multilingual dimension remains a practical concern for dissemination: the taxonomy must work in local languages, not just English. None of the Western Balkans languages are currently included as native ESCO languages.



1.3 Employer research: the 'missing middle'

Employer analysis identifies a structural gap that exists across all six countries. The region has entry-level talent, self-taught, motivated, and increasingly technically capable; and, in Serbia only, some established senior talent. What is almost entirely absent across Albania, Bosnia and Herzegovina, Kosovo, Montenegro and North Macedonia is the mid-level professional who can lead a small team, manage a pipeline, and deliver a commercial product.

Framework recommendations prioritise this 'missing middle' as the central organising concept for immediate intervention. Training that produces only entry-level talent, without a pathway to mid-level production competence, addresses the symptom rather than the structural constraint.

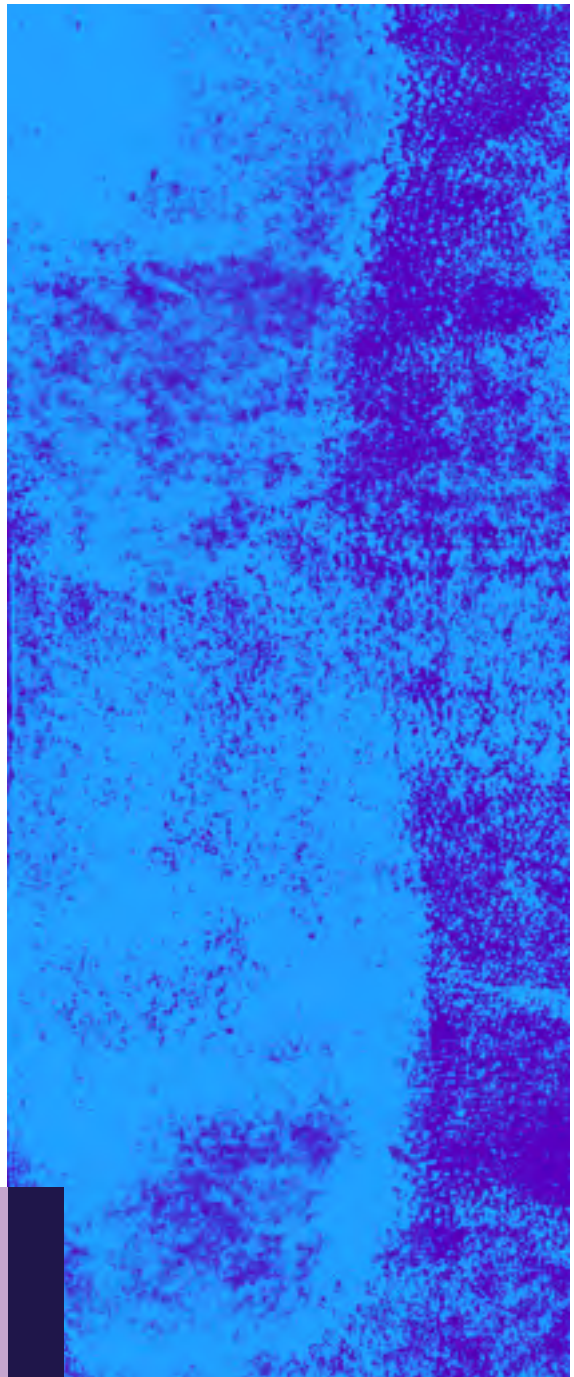
1.4 The SGA Model as Regional Template

The Serbian Games Association's workshop model – specifically the Player Narrative initiative – provides the most transferable intervention in the research to date. MadHead Games has hired directly from SGA workshops, making this the only employer-validated training pathway in the research. The framework should support intervention to replicate and extend this model across the region.

The model's transferability rests on three core elements: short-cycle delivery (8–12 weeks), direct employer involvement in curriculum design, and placement as the endpoint rather than a career option.

1.5 'Production Logic'

Graduates lack understanding of collaborative workflows, source control, and multi-disciplinary dependencies. This concept of 'production logic' has been embedded throughout the framework as a distinct, assessable competency cluster (see Section 2.3). It sits alongside but is not reducible to either technical skills or transversal skills.



2. Findings

2.1 The ESCO coverage gap is structural, not marginal

The ESCO coverage problem, as confirmed by employer research, is not a minor data gap but a structural one. The four roles most consistently identified as missing across all six countries are either absent from or poorly represented in ESCO:

Table 1 ESCO coverage gap

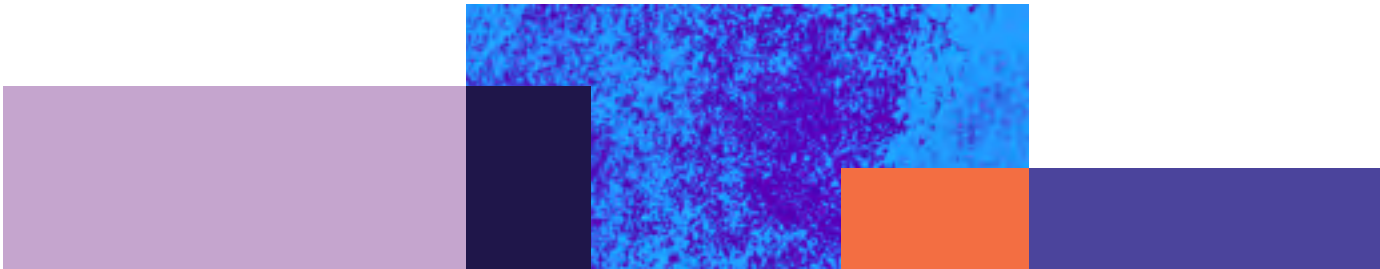
Role	ESCO Status	Consequence
Technical Artist	Absent	No anchor for curriculum design, qualification standards, or employment statistics
Pipeline TD	Very Poor	Mapped to Software Developer (2512), a category mismatch that misrepresents the role entirely
Real-Time VFX Artist	Absent	Hardest-to-fill role; invisible to formal systems
VFX Supervisor	Poor	Mapped to Film Director (2654.1), which is a category mismatch; film and games VFX supervision are structurally different
Games Producer	Weak	Weak mapping to Film/Media Producer; sector context entirely absent

These gaps demonstrate why the framework cannot simply 'use ESCO' for these roles. It must extend ESCO, and the employer research provides the evidence base for those extensions. Four formal ESCO extension proposals are set out in Section 6, along with a fifth proposal for Virtual Production Specialist – an emerging role identified by employers across North Macedonia, Serbia, and Montenegro as the most significant near-term change in production practice, for which no close ESCO equivalent exists.

2.2 AI introduces new risks in operation and taxonomies

ESCO's best current data is between one and five years old. Generative AI has fundamentally altered production workflows since 2022. This creates a content problem distinct from the coverage problem:

- The ESCO animator profile does not reflect the AI-assisted animation workflows now standard in many studios.



- The ESCO game designer profile does not reflect the data-driven design and live-service operations skills now required to maintain competitiveness.
- The ESCO VFX artist profile does not reflect the tool-specificity gap, particularly Houdini and Nuke specialisation, identified by Serbian employers and confirmed by North Macedonia's internationally active VFX studios as among the hardest skills to recruit for in the region.

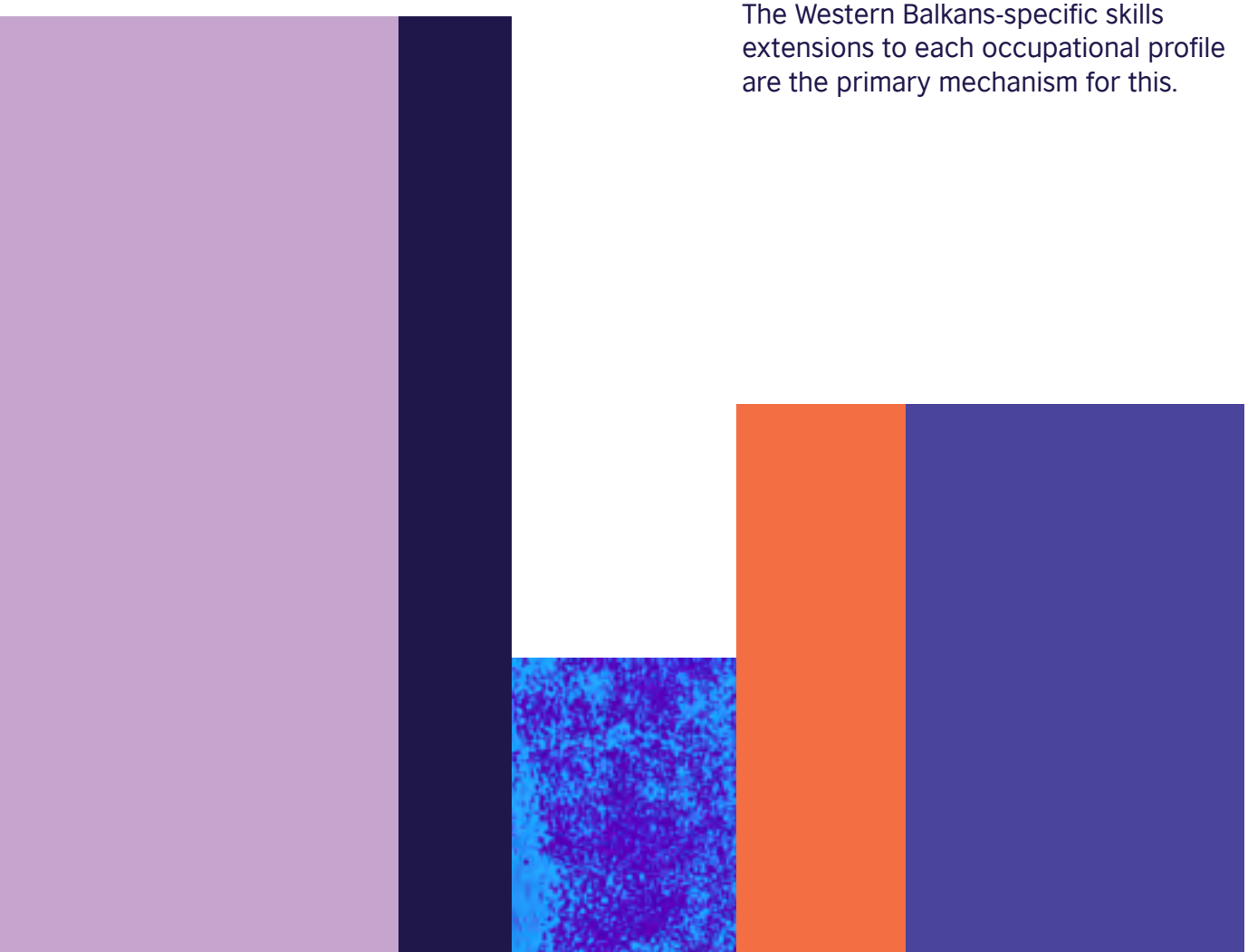
The practical implication is that ESCO must be used as a structural anchor, not as a content source. The skills content must come from the employer research, not from ESCO's existing skills profiles. The Tool Currency Annex (Section 3.4) is the mechanism for keeping content current after publication.

2.3 Vocabulary mismatch explains employer scepticism

There is a mismatch between the vocabulary used by industry and by ESCO: ESCO says 'animator' where the industry says 'rigger', 'character animator', or 'motion capture cleanup artist'. This in large part explains why employers across all six countries express scepticism about formal qualifications even when they exist.

> *If a qualification is described in ESCO vocabulary that does not match studio practice, employers cannot evaluate it. A graduate with a qualification in 'Multimedia Design' (ESCO vocabulary) applying for a role as a 'Technical Artist' (studio vocabulary) is invisible to the hiring manager.*

The taxonomy must bridge this vocabulary gap systematically. The Western Balkans-specific skills extensions to each occupational profile are the primary mechanism for this.



3. Consolidated Regional Picture

3.1 Maturity gradient

Integrating employer research across all six countries, NQF data, ESCO background document, and meeting transcripts, the resulting **maturity gradient** represents the most complete and accurate picture of the regional creative-tech skills landscape:

Table 2 Maturity gradient

Stage	Country	Maturity Description
1	Bosnia and Herzegovina	• Pre-industry, structurally fragmented • No unified state-level NQF; 14 education jurisdictions • Legal barriers to monetisation compound skills gaps
2	Albania	• Nascent, motivated • Strong self-taught talent pool; acute shortage of mid-level production professionals • No dedicated higher education for game development • Train the Trainers is the most urgent intervention
2	Kosovo	• Nascent, motivated creative digital industries sector, concentrated in Prishtina • Esports production is the most internationally visible sub-sector, with active engagement at European level • Acute production readiness gap at entry level; limited formal provision for any creative digital role
3	Montenegro	• Early, sector-diverse • May 2025 amendment to the Montenegrin Qualification Framework introducing micro-qualifications is the most significant recent legislative development in the region and makes Montenegro the strongest candidate to pilot new qualifications
4	North Macedonia	• Emerging mid-tier creative-tech economy in which VFX is dominant • The highest concentration of internationally active VFX studios in the region is in Skopje, with anchor employers producing work for international film and television markets • Game development sub-sector is structurally underserved by existing educational pathway • NQF document is the most analytically sophisticated in the research
5	Serbia	• Emerging mid-tier creative-tech economy • Anchor studios present • SGA workshop model is the only employer-validated training intervention in the research • Ubisoft's 2017 arrival transformed the ecosystem within a decade, emphasising the

Note: The gradient reflects overall ecosystem maturity across sub-sectors. For the VFX sub-sector specifically, North Macedonia's internationally active studios represent a level of production sophistication comparable to Serbia's games sector. The gradient should be read as cross-sector in scope rather than sub-sector specific.

3.2 Three universal gaps: high-confidence regional findings

These three gaps are validated by employer research, NQF analysis, ESCO background document, and meeting discussion across all six countries. They should be the organising framework for every country-level dissemination meeting.

Gap 1: Production Logic

The inability to function within a professional production pipeline – understanding version control, milestone discipline, cross-disciplinary dependencies, and asset optimisation constraints. Present at entry level in all six countries. Partially present at mid-level in Serbia only. This is the most operationally urgent gap: skills exist but cannot be deployed productively without production logic.

Gap 2: The Missing Middle

The near-total absence of mid-level professionals who can lead small teams, manage production pipelines, and deliver commercial products. Present in all six countries. Partially addressed in Serbia through Wargaming Forge and SGA workshops. Until this gap is addressed, the region will continue to lose its best entry-level talent to better-resourced markets.

Gap 3: ESCO Invisibility

The roles that matter most to the regional ecosystem - Technical Artist, Pipeline TD, Real-Time VFX Artist, Games Producer - are either absent from or poorly represented in ESCO. Because they are absent from ESCO, they are also absent from NQF qualification standards, university curricula, and employment statistics. They are structurally invisible to the policy systems that should be supporting their development.

3.3 Country-Specific Findings of Regional Significance

Serbia: Ubisoft effect

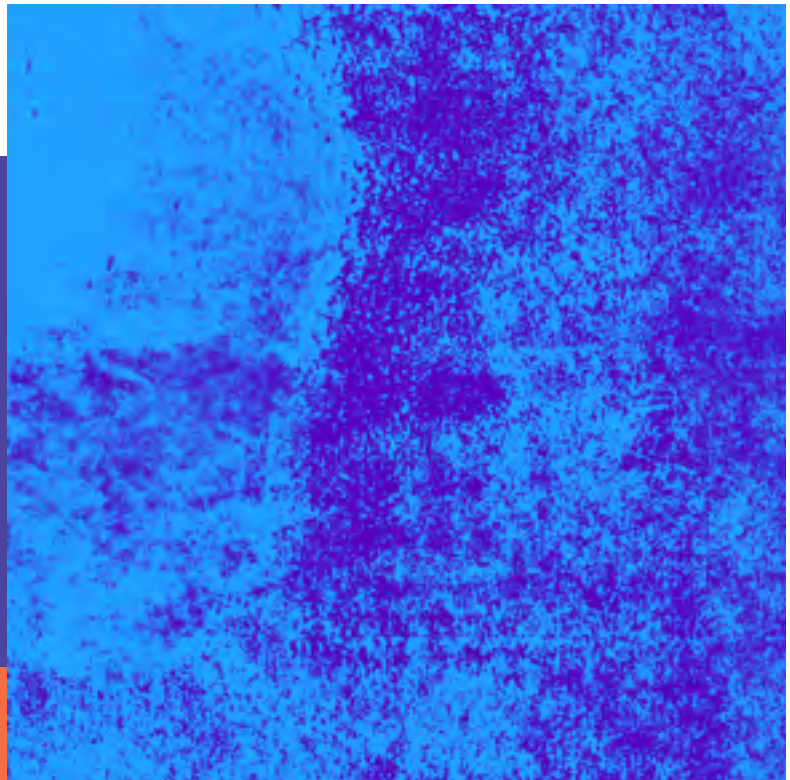
The arrival of one major international studio in 2017 transformed Serbia's ecosystem within a decade from a nascent talent pool to a functioning regional anchor with established mid-tier studios, an active industry association, and the only employer-validated training pathway in the research. This is an important structural lesson for the region and should inform policy recommendations for those countries.

Montenegro: Micro-qualification opportunity

The May 2025 Amendment to the Montenegro Qualification Framework is the most significant recent legislative development in the regional NQF landscape. It introduces the first legal definition of micro-qualifications in Montenegrin law, creating an immediate implementation pathway for the framework's most urgent interventions. Combined with Montenegro's sector diversity (games, animation, film, creative agency, tech) and the potential of Tehnopolis to act as an ecosystem hub, Montenegro is the strongest candidate for a regional pilot.

The 2025 Amendment establishes a new credential taxonomy with direct implications for how micro-qualifications developed under this framework should be designed and issued; the full taxonomy and its implementation implications are set out in the Montenegro national pathway in Document 2, Section 5.

A critical structural note: none of the 15 existing Montenegrin Sectoral Commissions covers games, VFX, or animation. Establishing a 16th Commission for Creative and Digital Industries is therefore a prerequisite for any formal MQF pathway for the roles identified in this framework.



Framework and Methodology for VET Development

A Skills Taxonomy and Vocational Education Framework for the Western Balkans Creative Economy

1. Design Principles

The framework is built on six non-negotiable design principles derived from the research. These are not aspirational statements but architectural constraints: departing from any one of them produces a framework that fails a significant stakeholder group or fails to function in at least one national context.

Principle 1: ESCO as anchor, not content source

The framework uses ESCO's structural architecture, its occupation hierarchy, skill concept format, and EQF alignment as its foundation. It does not use ESCO's existing skills profiles for games, VFX, and animation roles as content, because those profiles are outdated, incomplete, and vocabulary-mismatched to a degree that would actively misdirect curriculum designers and job seekers. The skills content comes from the employer research.

Principle 2: Skills-based, not job-title-based

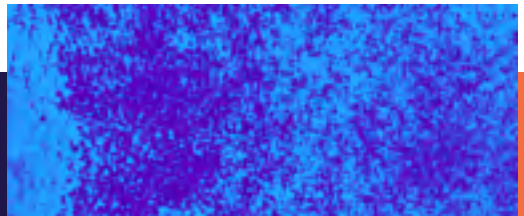
Following the background document's analysis, the framework describes what practitioners can do rather than what their job is called. This makes it visible to the self-taught majority, compatible with RPL pathways, and resilient to the rapid role evolution characteristic of the sector.

Principle 3: Production logic as a core competency

'Production logic' - the ability to function within a professional production pipeline - is treated as a distinct, assessable competency cluster that sits alongside but is not reducible to technical skills or transversal (interpersonal or “soft”) skills. It is the framework's most important original contribution to the ESCO architecture and the most universal gap across all six countries.

Principle 4: System maturity influences speed of implementation

The framework provides a single regional architecture but differentiated national implementation pathways calibrated to each country's NQF maturity, ecosystem development stage, and institutional capacity. A pathway appropriate for Serbia, where anchor studios, an active industry association, and an operational Recognition of Prior Learning (RPL) procedure are already in place, is not appropriate for BiH, where no unified state-level NQF exists and industry micro-credentials outside the formal NQF represent the only viable near-term approach.

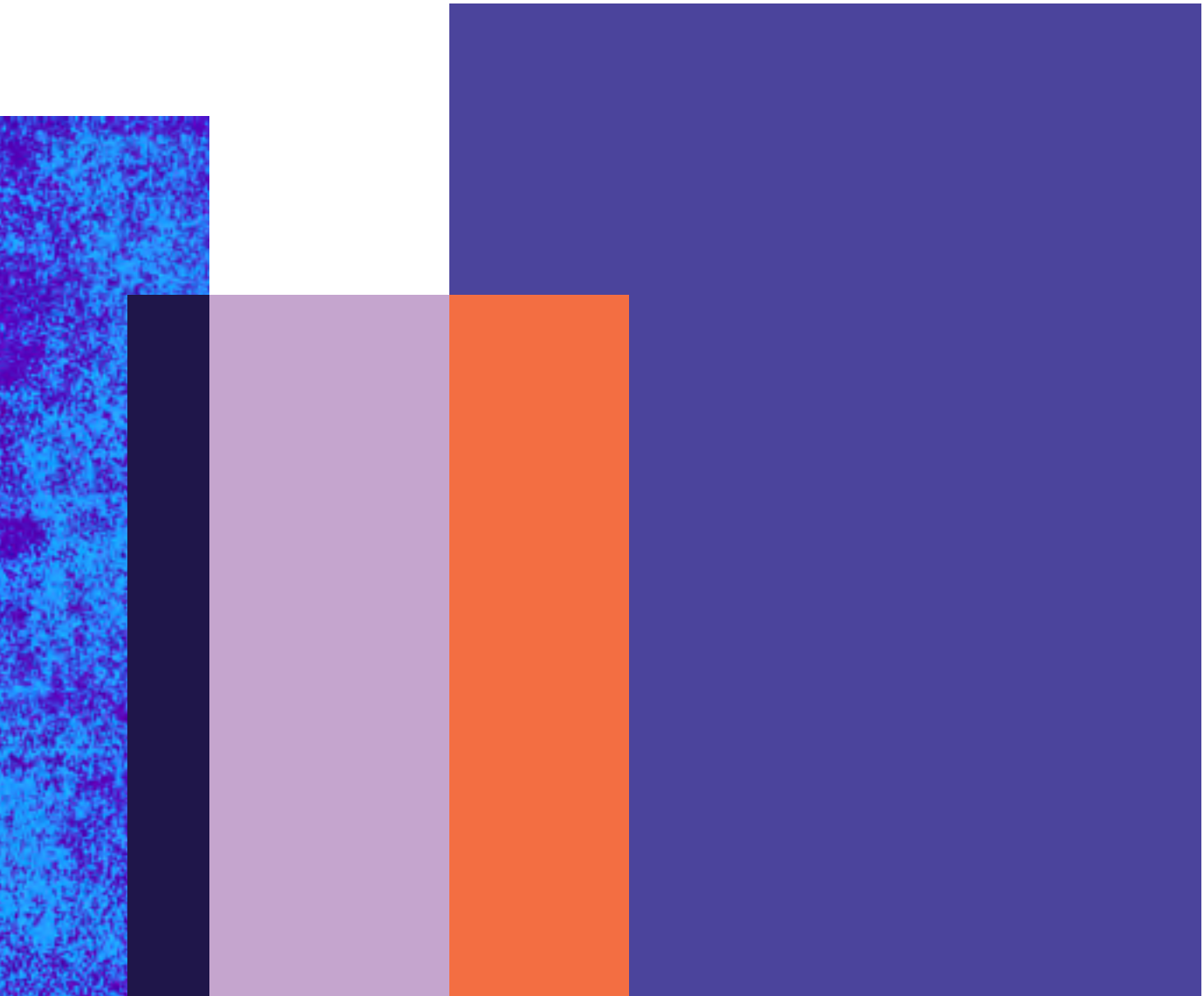


Principle 5: Adoption by design

Following the background document's analysis of why taxonomy projects fail – including the Australian National Skills Classification (see Appendix B), which was effectively deprecated within 2.5 years of launch – adoption design is built into the framework from the outset. Each stakeholder group has a specific, compelling reason to use the framework, and a specific interface through which to access it.

Principle 6: Living document architecture

Given ESCO's update lag and the pace of change in the sector, the framework is designed to update faster than a traditional NQF qualification cycle. The Tool Currency Annex (updated annually), the Practitioner Panel (meeting quarterly), and the ESCO Extension Proposals (submitted at each ESCO update cycle) are the mechanisms for keeping the framework current.



2. Occupational Architecture

2.1 Ten Priority Occupations

The employer research across all six countries identifies ten roles as most critical for regional ecosystem development, mapped below to their ESCO equivalents with coverage quality assessed using the background document's framework:

#	Priority Occupation	ESCO Nearest Equivalent	ESCO Code	Coverage	Action Required
1	Technical Artist	None	—	Absent	New ESCO concept proposal. Priority development – most universally cited missing role.
2	Game Developer (Unity/Unreal)	Software Developer	2512	Very Poor	New occupation extension. Substantial Western Balkans-specific skills added (see Section 2.4).
3	3D Artist (Games-Optimised)	Animator	2651.1	Poor	Substantial skills extension. RPL pathway for self-taught practitioners essential.
4	VFX Artist (Real-Time)	None (dedicated)	—	Absent	New ESCO concept proposal. Distinct from film VFX; real-time engine context requires separate profile.
5	Game Designer	Multimedia Designer	2166.2	Partial	Skills profile update. AI-assisted and live-service skills absent from current ESCO.
6	Animator (Real-Time)	Animator	2651.1	Moderate	Specialisation extension. AI-assisted animation workflows not in current ESCO.
7	Matchmove Artist / Camera Tracker	Graphic Designer (adjacent)	2166.1	Poor	New occupation profile. Camera science and photogrammetry skills absent from ESCO. See expanded profile (Section 2.5).
8	Animator (Film/ Craft)	Animator	2651.1	Moderate	Separate profile needed from real-time animator – different tools, pipeline context, career pathway.

#	Priority Occupation	ESCO Nearest Equivalent	ESCO Code	Coverage	Action Required
9	Game Producer	Film/Media Producer (adjacent)	—	Weak	New sector-specific profile. Addresses the missing middle gap most directly.
10	Narrative Designer	None (dedicated)	—	Absent	New ESCO concept proposal. Wargaming: 'practically no local experience'; hired based on intuition.

Two additional roles identified in the employer research fall outside the ten priority occupations but warrant explicit acknowledgement.

- **Virtual Production Specialist**, combining real-time engine knowledge, traditional VFX competencies, and on-set production experience, is identified by multiple employers across North Macedonia, Serbia, and Montenegro as the most significant near-term emerging role; no close ESCO equivalent exists, and a formal ESCO extension proposal is included in Section 6.
- **Esports Broadcast Producer** and **iGaming Platform Developer** are similarly absent from ESCO and from any existing training pathway in the region; both are addressed within the framework's extensibility provisions (see Section 7).

2.2 Technical Artist profile (priority development)

Technical Artist is the single most important new occupation for the framework because it is the most consistently identified missing role across all six countries and all three sub-sectors, it sits at the intersection of the two most critical skills gaps (technical depth and creative judgement), and it is the role most amenable to structured upskilling. It does not exist in ESCO, meaning there is no competing definition to navigate.

Table 3 Technical Artist: proposed ESCO-format profile

Field	Detail
Preferred term	Technical Artist
Alternative labels	Tech Art, TA, Technical Art Director (senior), Pipeline Artist
ISCO-08 mapping	2166 (Graphic and Multimedia Designers, with proposal for sub-classification
EQF level	5–6 (depending on seniority and specialisation)
Description	Technical Artists bridge the art and engineering teams in game, VFX, and animation production. They translate artistic vision into technically feasible assets, develop tools and pipelines that improve production efficiency, and ensure that creative output meets the performance constraints of real-time engines and production pipelines. The role requires both artistic sensibility and programming proficiency.

Table 4 Technical Artist: essential skills (from employer research)

Skill Area	Detail
Real-time engines	Unreal Engine 5 / Unity
Scripting & pipeline automation	Python, Blueprint, C#
Asset optimisation	Real-time environment constraints
Version control	Git, Perforce
Cross-disciplinary communication	Art-to-engineering translation
Shader development	HLSL, Unreal Material Editor, Shader Graph
Production pipeline integration	Confirmed by all Serbian employers

Technical Artist: optional skills

- Motion capture data processing
- Procedural content generation (PCG)
- AI-assisted asset generation tools: Meshy (3D generation), Cursor (code assistance), Midjourney (concept reference)

2.3 Production Logic competency cluster

Production Logic is the competency cluster most consistently identified as absent in the employer research and the framework's most important original contribution. It does not exist in ESCO but is present, in different forms, in the Singapore Skills Framework's 'workplace competencies' architecture (the closest international equivalent).

Definition

Production Logic is the set of competencies that enable a practitioner to function effectively within a professional creative production environment. It is distinct from technical skills (what tools you can use) and transversal skills (how you work with people) because it specifically concerns the systemic understanding of how creative production works as an integrated process.

Table 5 Production logic definitions

Code	Sub-Competency	Definition	EQF Level Range
PL1	Pipeline Awareness	Understanding how individual tasks connect to the overall production pipeline; how upstream decisions affect downstream work; asset dependencies and handoff protocols.	3 (awareness) to 5 (mastery)
PL2	Version Control Discipline	Consistent use of version control systems (Git, Perforce) as a professional practice; branching, merging, and conflict resolution in a team context.	3 (basic use) to 4 (team context)
PL3	Milestone Discipline	Scoping tasks accurately; communicating blockers proactively; delivering to agreed milestones under real production pressure. Up to 90% of recruits miss deadlines even when they understand them: the gap is behavioural, not cognitive.	3 (basic) to 5 (leadership)

Code	Sub-Competency	Definition	EQF Level Range
PL4	Cross-Disciplinary Communication	Translating technical constraints into creative language and vice versa; giving and receiving structured feedback within a production context. Most frequently cited gap by Serbian employers.	3 (basic) to 6 (leading teams)
PL5	Commercial Awareness	Understanding how production decisions affect commercial outcomes; awareness of budget constraints, platform requirements, and market positioning. It cannot be taught in a classroom; it develops through exposure to real client and market dynamics.	4 (awareness) to 6 (strategic)

Assessment note: Production Logic competencies cannot be assessed through traditional examination. Assessment must use portfolio review and production sprint (time-pressured team project) methodologies. See Section 4.2.

2.4 Game Developer: Western Balkans expanded profile

The expanded skills profile for Game Developer (Unity/Unreal) draws on the full technical skills analysis, incorporating categories identified as absent from or underrepresented in the current ESCO Software Developer profile.

Table 6 Game Developer: Western Balkans-specific technical Skills (key categories)

Category	Skills
Programming	• C++ and C# game programming • Game scripting languages (Lua, GDScript, Verse) • Shader programming (HLSL, GLSL) • Visual scripting (Unreal Blueprints, Unity Visual Scripting)
Game Engines & Frameworks **(none of these are listed in ESCO)**	• Unreal Engine 5 development • Unity development; • Custom engine development • Engine architecture and subsystem design
Graphics & Rendering **(all absent from ESCO)**	• Graphics API programming (DirectX 12, Vulkan, Metal) • Real-time rendering pipeline • Lighting and global illumination • Ray tracing • GPU compute and optimisation • LOD and culling systems
Physics & Simulation	• Physics engine integration (PhysX, Havok, Bullet, Jolt) • Rigid body dynamics • Soft body • Cloth and hair simulation • Fluid simulation

Category	Skills
AI & Gameplay Systems	• NPC behaviour systems • Pathfinding and navigation • Procedural content generation • Machine learning in games
Networking & Multiplayer	• Client-server architecture; • Lag compensation and prediction • Matchmaking • Dedicated server development • Anti-cheat
Animation Systems	• Skeletal animation • Motion matching • Procedural and physics animation • Facial and morph target systems • MoCap pipeline integration
Optimisation & Build	• CPU and GPU profiling • Memory management • Data-oriented design (ECS) • Multithreading and job systems • CI/CD for game projects

Table 7 Game Developer: professional and personal skills

Skill	Level	Description
Adaptability & Resilience	Advanced	Adjusting effectively to changing work demands, environments or priorities while sustaining performance and well-being
Analytical Thinking	Advanced	Breaking down information systematically into its component parts to identify patterns, relationships and underlying logic
Collaborative Teamwork	Advanced	Contributing to group efforts by sharing knowledge, coordinating activities and supporting colleagues to achieve shared objectives
Complex Problem Solving	Advanced	Identifying multifaceted problems, analysing related information, and developing, evaluating and implementing appropriate solutions
Creative and Innovative Thinking	Intermediate	Generating novel ideas or reframing existing approaches to develop improved methods, products or services
Feedback Integration	Advanced	Seeking, interpreting and applying constructive feedback to continuously improve personal performance and work outputs
Judgement & Decision Making	Advanced	Weighing the costs, benefits and risks of alternative courses of action
Project Governance & Delivery	Intermediate	Planning, monitoring and controlling tasks or projects from initiation through to successful completion
Quality Orientation & Precision	Advanced	Applying thoroughness and accuracy to tasks and deliverables to minimise errors and maintain high standards
Time & Resource Management	Advanced	Planning and prioritising own work and organisational resources to meet competing demands and deadlines effectively

2.5 Matchmove Artist: Western Balkans expanded profile

The Matchmove Artist profile represents an occupation not currently represented within ESCO. It is constructed using occupational terminology identified through desk research and the Camera Artist Match Mover Technical Skills by Grouping dataset, and serves as the worked example of ESCO extension methodology for VFX-specific roles.

Table 8 Matchmove Artist: core profile

Field	Detail
Preferred term	Matchmove Artist
Alternative labels	Matchmover, Tracker, Camera Tracking Artist, Camera Tracker, 3D Tracker, Camera Match Artist, Post-vis Artist, Layout Artist
ISCO-08 mapping	2166 (Graphic and Multimedia Designers) - **sub-classification proposed**
EQF level	5–6
Description	Matchmove artists recreate digital versions of the camera, lens, and object movements from live-action footage so that computer-generated elements can be seamlessly combined with real photography.

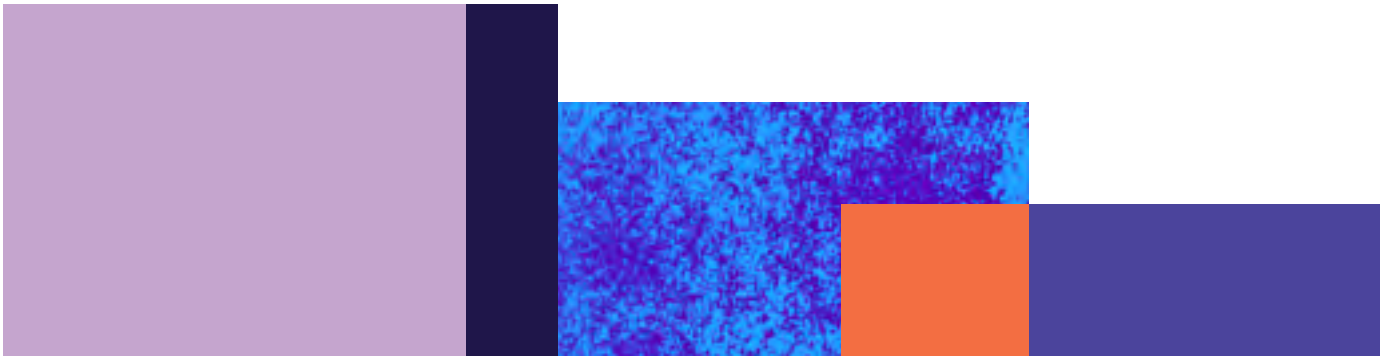
Table 9 Matchmove Artist: Western Balkans-specific technical skills (key categories)

Category	Skills
3D Tracking & Matchmoving (majority absent from ESCO)	• Camera solve / 3D camera tracking • Object tracking • Body and face tracking • Planar tracking • Stabilisation/destabilisation • Survey data integration • Multi-camera / stereo tracking • Point cloud generation
Camera Science & Lens Knowledge **(all absent from ESCO)**	• Lens distortion modelling • Lens breathing / focus characteristics • Anamorphic lens workflows • Camera sensor and metadata knowledge • Photogrammetry and set scanning • On-set data acquisition
Layout & Virtual Cinematography	• 3D scene layout and set dressing • Virtual camera operation • Previsualization (previz) • Post visualization (postviz) • Technical vis (techviz) • Virtual production and LED volume workflows

Category	Skills
Compositing & Integration	• 2D compositing fundamentals • CG integration and lighting match • Roto and matte extraction • Projection mapping • Stereo compositing
Mathematics & Scripting	• Linear algebra / matrices • Projective geometry • Coordinate systems • Euler / Quaternions • Focal length / FOV calculations • Python scripting for VFX • App-specific scripting
Emerging & AI-Assisted	• Markerless / AI tracking • NeRF / Gaussian splatting • ML for tracking/roto • Real-time engine workflows (UE/Unity)

Table 10 Matchmove Artist: professional and personal skills

Skill	Level	Description
Adaptability & Resilience	Intermediate	Responding to changing plate conditions, software updates, and production schedules
Analytical Thinking	Advanced	Diagnosing and resolving complex camera solve and integration problems systematically
Collaborative Teamwork	Advanced	Working closely with VFX supervisors, compositors, and on-set crew
Complex Problem Solving	Advanced	Finding solutions to technically difficult plates with limited reference data
Creative and Innovative Thinking	Advanced	Developing novel approaches to tracking challenging footage
Feedback Integration	Advanced	Incorporating dailies feedback and client notes precisely and rapidly
Judgement & Decision Making	Advanced	Prioritising solve accuracy versus turnaround time under production pressure
Quality Orientation & Precision	Advanced	Applying pixel-level accuracy requirements in CG integration
Time & Resource Management	Advanced	Managing multiple shot deliveries simultaneously within tight post-production schedules



3. Skills Architecture

3.1 Four-layer skills model

The framework organises skills into four layers, each serving a different purpose and a different stakeholder group. The layers are cumulative, not alternatives: all four are required for a complete occupational profile.

Table 11 Four-layer skills model

Layer	Content	Stakeholder Use
1	ESCO Transversal Skills	The S1–S6 transversal skills hierarchy provides the foundation layer. Adopted without modification but specified as essential vs. optional for each occupation - a specification ESCO does not provide for creative-tech roles.
2	ESCO Occupation-Specific Skills (adapted)	Existing ESCO occupation-specific skills for the nearest equivalent occupations, adopted as a starting point but substantially extended and corrected using employer research. For each of the ten priority occupations, the framework specifies which existing ESCO skills are retained, flagged for update, or missing entirely.
3	Production Logic (framework innovation)	The five Production Logic sub-competencies (PL1–PL5). Assessed through portfolio and production sprint evidence rather than examination. The primary mechanism for making the self-taught majority visible within the formal qualifications system.
4	Tool Currency Annex (living document)	A regularly updated list of the specific tools, software versions, and technologies currently in industry use for each of the ten priority occupations. Not part of the formal qualification standard but published alongside it as an employer-facing reference document. Updated annually by the regional Practitioner Panel.

3.2 EQF Level alignment

All ten priority occupations sit at EQF Levels 4–6, reinforcing the finding that the skills gap is concentrated in the mid-professional range, not at entry level. The learning-outcomes orientation of both EQF and the Montenegrin Credit Transfer System (CSPK) is directly compatible with the portfolio and production-sprint assessment modes the framework requires.

3.3 Western Balkans language strategy

None of the Western Balkans languages are currently included as native ESCO languages. The framework addresses this through a three-phase translation strategy:

- **Phase 1:** Translate the ten priority occupational profiles and the Production Logic competency cluster into Serbian/Croatian/Bosnian (mutually intelligible), Albanian, and Macedonian.

- **Phase 2:** Submit translations to ESCO as proposed language extensions; ESCO's architecture supports this, and the EU actively encourages it for candidate countries.
- **Phase 3:** Ensure all learner-facing tools are available in local languages from launch. A tool that only works in English will systematically exclude the majority of the workforce it is designed to serve.

3.4 Tool Currency Annex: 2026 Edition

The following tool lists represent the current state of industry-standard software for each priority occupation. This annex is updated annually by the regional Practitioner Panel based on employer survey data.

Table 12 Tool Currency Annex: Technical Artist (2026)

Category	Tools
Real-time engines	Unreal Engine 5.3+, Unity 6
3D tools	Maya 2025, Blender 4.x, Houdini 20.x (advanced)
Scripting	Python 3.x, Blueprint (Unreal), C# (Unity)
Version control	Perforce Helix Core, Git/GitHub
Pipeline tools	Shotgrid/Flow Production Tracking, Jira
AI-assisted tools	Meshy (3D generation), Cursor (code assistance), Midjourney (concept reference)
Shader tools	HLSL, Unreal Material Editor, Shader Graph (Unity)

Table 13 Tool Currency Annex: Game Developer (2026)

Category	Tools
Primary engines	Unreal Engine 5.3+ (Blueprint + C++), Unity 6 (C# + DOTS/ECS)
Secondary engines	Godot 4.x, CryEngine, GameMaker (2D/indie)
Graphics APIs	DirectX 12, Vulkan, WebGPU (emerging)
Upscaling / AI rendering	DLSS 3, FSR 3, XeSS, frame generation
Version control	Perforce Helix Core, Git/GitHub, Plastic SCM
Build & CI/CD	Jenkins, GitHub Actions, Incredibuild
Profiling	Unreal Insights, Unity Profiler, PIX (DX12), RenderDoc
Multiplayer backend	Photon, Mirror, Netcode for GameObjects, Beamable

Table 14 Tool Currency Annex: Matchmove Artist (2026)

Category	Tools
Primary tracking	3DEqualizer 5.x, PFTrack 2024, SynthEyes 2024
Compositing (integration)	Nuke 15.x, Fusion 19
Photogrammetry	RealityCapture 1.4, Agisoft Metashape 2.x, Meshroom
AI-assisted tracking	SynthEyes AI, Nuke CopyCat (trained roto), NeRF-based tools
Layout / Previs	Maya 2025, Unreal Engine 5 (Virtual Camera), Cine Tracer
Version control	Git/GitHub, Perforce (large studios)
Pipeline / Asset mgmt	Shotgrid/Flow Production Tracking, ftrack, Kitsu

4. Assessment Architecture

4.1 Why traditional assessment fails this sector

The employer research is unambiguous and consistent: the competencies that matter most cannot be assessed through traditional examination. This finding was consistent across all six employer research streams – the following responses are representative:

> *"Training programmes can fall short if they are not creating unique outcomes / mini projects during training."*

> *"Industry placements are the most effective route for preparing candidates."*

4.2 Three assessment modes

Assessment Mode 1: Portfolio Review (Layers 1–2)

For technical and creative skills, assessment is based on a portfolio of completed work demonstrating competency in context. Portfolio standards are specified for each of the ten priority occupations, including minimum requirements for:

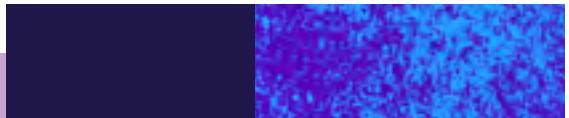
- Number and type of completed projects
- Evidence of tool proficiency (screenshots, process documentation, render outputs)
- Evidence of production context (team credits, version history, milestone records)

Assessment Mode 2: Production Sprint (Layer 3: Production Logic)

For Production Logic competencies, assessment is conducted through a time-pressured team project of 2–4 weeks in which candidates must work within a defined pipeline with real asset handoffs, use version control throughout, deliver to milestone gates with documented communication, and receive and respond to feedback from a simulated 'lead' role. This assessment mode is modelled on the SGA workshop format (Serbia) and the Zonda Creative onboarding programme (Kosovo), both employer-validated interventions in the research.

Assessment Mode 3: RPL Portfolio (All Layers: self-taught pathway)

For self-taught practitioners seeking formal recognition, the framework provides a Recognition of Prior Learning pathway based on: portfolio of completed commercial or community projects; evidence of tool proficiency; employer or client references confirming production context; and a structured interview with an industry assessor. This pathway is an important mechanism for making the self-taught majority visible within the formal qualifications system. It is modelled on Serbia's existing RPL procedure, already piloted and operational.



5. National Implementation Pathways

A single uniform implementation pathway is not appropriate for six countries at different stages of NQF maturity and ecosystem development. The framework provides a common architecture (Sections 1–4) with six differentiated national pathways.

Serbia: Formal NQF Integration (12–18 months)

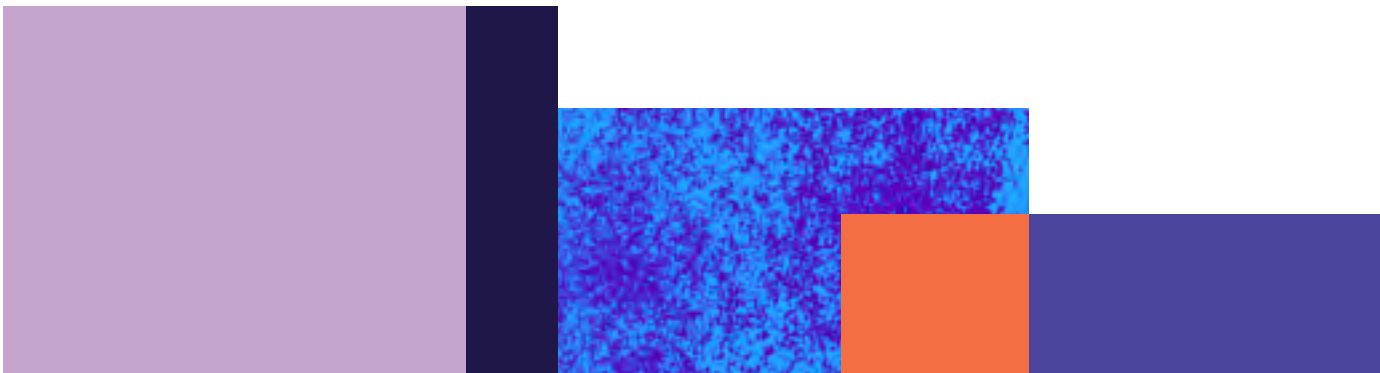
- **Mechanism:** Submit occupational standards for the ten priority roles to the Qualifications Agency for inclusion in the NQFS Register
- **Entry point:** Sector Skills Council initiative: propose a new creative-tech Sector Skills Council or expand the existing ICT council
- **ESCO action:** Connect NQFS register entries to ESCO concepts via Europass (already in progress for other sectors)
- **Immediate action:** Map SGA workshop outcomes to EQF Level 4–5 descriptors and submit for recognition as micro-qualifications
- **Anchor partners:** Regional Practitioner Panel and SGA to provide curriculum co-design, delivery and employer validation
- **Priority:** Technical Artist and Game Developer occupational standards first: highest employer demand, clearest evidence base

Montenegro: Micro-qualification pilot (6–12 months)

Montenegro is the priority pilot country. The May 2025 MQF Amendment provides the fastest available legal pathway in the region. Three micro-qualifications are proposed for immediate development:

Table 15 Montenegro Micro-qualification pilot

Micro-Qualification	EQF Level
MQ1: Game Development Fundamentals (Unity/Unreal)	Level 3–4
MQ2: Technical Art for Real-Time Production	Level 4–5
MQ3: Production Pipeline Management	Level 4–5



The 2025 MQF Amendment establishes the following credential taxonomy, which has direct implications for how micro-qualifications developed under this framework should be designed and issued:

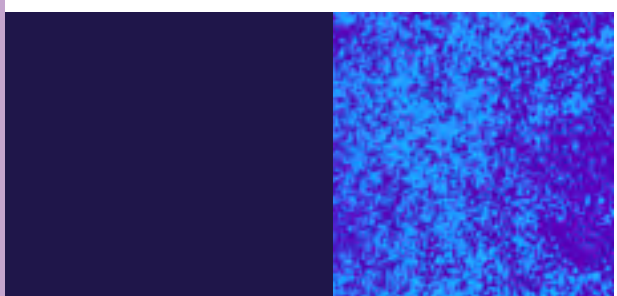
Table 16 Micro-qualification credential taxonomy

Credential	Proof of
Certificate	An acquired vocational qualification
Confirmation	An acquired micro-qualification or part of a vocational qualification: the primary instrument for micro-qualifications developed under this framework
Transcript	An acquired other qualification

- **Credential type:** Confirmation (as defined by the May 2025 MQF Amendment - proof of acquired micro-qualification)
- **Entry point:** Propose a new Sectoral Commission for Creative and Digital Industries (currently absent from all 15 existing commissions and a prerequisite for any formal MQF pathway)
- **Anchor partners:** Tehnopolis (delivery hub) plus Regional Practitioner Panel provide validation
- **Structural note:** MQF register currently covers only Levels II–V. All ten priority roles sit at Levels 5–6. Registry expansion is a parallel requirement.
- **ESCO linkage:** Not formally embedded in MQF. Pursuit of formal ESCO alignment should be recommended as part of EU accession preparation.

Albania: VET Catalogue extension (18–24 months)

- **Mechanism:** Submit new qualifications to NAVETQ for inclusion in the National Catalogue of Vocational Qualifications
- **Challenge:** 4-year update cycle is too slow; request emergency update procedure or develop as non-formal accredited programmes pending catalogue inclusion
- **Entry point:** Engage NAVETQ directly; use the EQF referencing report (completed January 2024) as alignment basis
- **Anchor partners:** Holberton School (technical delivery); TUMO Tirana (junior pipeline); Regional Practitioner Panel
- **Priority:** Game Developer and AI-Assisted Production Specialist are Albania's most acute employer-identified gaps
- **Immediate action:** Train-the-Trainers programme for university educators is the most urgent intervention identified by Albanian employers

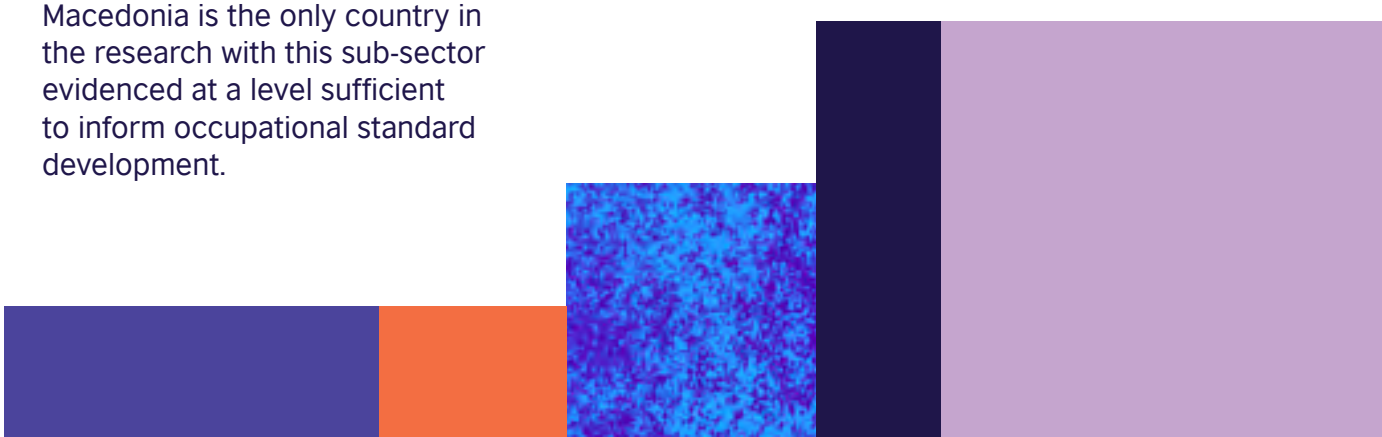


North Macedonia: Occupational Standards sevelopment (12–18 months)

- **Mechanism:** Develop occupational standards under the 2025 NQF law obligations; the new law explicitly requires alignment with EQF and QF-EHEA
- **Entry point:** Engage Ministry of Education and Science and the National Board for the NQF directly
- **Advantage:** North Macedonia's NQF document is the most analytically sophisticated in the research. The country hosts the highest concentration of internationally active VFX studios in the region, providing a strong employer evidence base for occupational standard development across multiple priority roles.
- **Anchor partners:** Tier-1 VFX and post-production studios (occupational standard co-design for Matchmove Artist, lookdev Artist, Groom Artist, and CFX Artist)
- **Priority occupational standards:** Technical Artist, Game Designer, Level Designer, Matchmove Artist, and Game Developer (in that order of urgency based on employer evidence)
- **Distinctive sub-sector:** Medical animation and interactive 3D simulation should be explicitly recognised within the framework's occupational taxonomy. North Macedonia is the only country in the research with this sub-sector evidenced at a level sufficient to inform occupational standard development.
- **Governance note:** North Macedonia employer participants should be engaged in the Regional Practitioner Panel specifically to represent the position, held by a minority but evidentially significant group of employers, that deep theoretical grounding takes precedence over tool-specific training. This is an important corrective to the framework's dominant emphasis on practical skills and should be represented in the governance architecture.

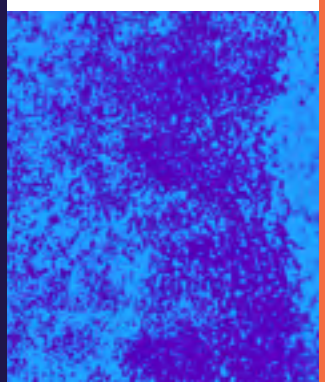
Kosovo: Non-Formal Accreditation Pathway (18–24 months)

- **Mechanism:** Develop accredited non-formal programmes through the Kosovo Accreditation Agency (KAA)
- **Challenge:** NQF database not publicly functional: KAA website being down is a fundamental barrier to any formal qualification development
- **Entry point:** AAB College partnership (already established employer MoU)
- **Anchor partners:** AAB College (institutional host) and Regional Practitioner Panel
- **Priority:** Formalising the existing onboarding programme recognised in the MoU with AAB College as an accredited short course would offer the fastest route to a recognised credential in Kosovo



Bosnia and Herzegovina: Industry micro-credentials outside formal NQF (24–36 months for formal recognition)

- **Mechanism:** Develop industry-recognised micro-credentials delivered by non-formal providers, explicitly positioned as 'EQF Level X equivalent' pending formal adoption
- **Challenge:** No unified state-level NQF; 14 education jurisdictions; no legal pathway for state-level qualification adoption
- **Entry point:** INTERA Technology Park (Mostar) as the primary delivery hub
- **Anchor partners:** INTERA (delivery); University of Sarajevo and SSST (formal education bridge); Regional Practitioner Panel
- **Priority:** Production Pipeline Management micro-credential first – addresses the most universal gap and requires no formal NQF approval
- **Immediate action:** Address legal barriers to monetisation (Google Merchant ID, double taxation) as a parallel policy recommendation; skills development without commercial viability is insufficient



6. ESCO Extension Proposals

The framework makes five formal proposals for new ESCO concepts, supported by the employer research evidence base. These should be submitted to the ESCO maintenance committee at the next update cycle.

Proposal 1: Technical Artist (new occupation)

- **Evidence base:** Identified as missing by employers in all six countries; confirmed absent from ESCO
- **Proposed ISCO-08 mapping:** 2166 (sub-classification)
- **Essential skills:** As specified in Section 2.2

Proposal 2: Real-Time VFX Artist (new occupation)

- **Evidence base:** Identified as hardest-to-fill role by Wargaming and MadHead Games; confirmed absent from ESCO
- **Proposed ISCO-08 mapping:** 2166 (sub-classification, distinct from Film VFX)
- **Distinguishing feature:** Real-time engine context (Unreal/Unity) vs. offline rendering (Nuke/Houdini) – structurally different roles requiring different skills profiles

Proposal 3: Narrative Designer (new occupation)

- **Evidence base:** Identified as a role with 'practically no local experience'; confirmed absent from ESCO
- **Proposed ISCO-08 mapping:** 2166 or 2641 (Authors, Journalists), subject to further discussion
- **Distinguishing feature:** Combines creative writing with game systems design; neither existing ESCO occupation captures this combination

Proposal 4: AI-Assisted Production Specialist (new emerging role)

- **Evidence base:** Identified as an emerging role by INTERA and multiple employers across all six countries
- **Proposed ISCO-08 mapping:** New sub-classification required: this role does not fit cleanly into any existing ISCO-08 category
- **Note:** The proposal acknowledges that the role is still emerging and the skills profile will evolve rapidly. Should be submitted as an 'emerging occupation' with a commitment to review within 24 months.



Proposal 5: Virtual Production Specialist (new occupation)

- **Evidence base:** Identified by multiple employers across North Macedonia, Serbia, and Montenegro as the most significant near-term change in VFX and animation production practice; confirmed absent from ESCO
- **Proposed ISCO-08 mapping:** New sub-classification required: the role combines on-set production, real-time engine operation, and traditional VFX competencies in a way that does not fit any existing ISCO-08 category
- **Distinguishing feature:** Integrates real-time game engine knowledge (Unreal Engine), LED volume operation, motion tracking integration, and the coordination of physical and virtual production elements in a live environment – a combination of skills that existing VFX or film production ESCO profiles do not capture
- **Supporting evidence:** Tier-1 VFX and post-production studios in North Macedonia; VFX and training providers in Serbia; multiple Montenegro employer respondents

7. Adoption Strategy

7.1 Four stakeholder interfaces

The framework's communication strategy reflects a key finding from the employer research: the case for qualification development should not be made on the grounds that qualifications will produce industry-ready candidates. They will not, and employers know it. The case should be made on the grounds that qualifications make talent **visible, mobile, and fundable**;

- **Visible** to employers, funders, and policymakers who cannot currently see the regional talent pool
- **Mobile** between studios, countries, and sub-sectors without requiring practitioners to prove their competence from scratch at each transition
- **Fundable** through the accountability structures that public and private investment requires.

These are the three things the region's creative digital workforce currently lacks, and they are the framework's answer to employer scepticism about formal qualifications.

7.1.1 For Policymakers: Regional Dashboard

A publicly accessible dashboard showing

- Workforce readiness scores by country (updated annually from employer survey)
- Skills gap heat map by occupation and country
- Training provision coverage by occupation and country
- NQF integration progress by country

7.1.2 For Educators: Curriculum Alignment Tool

An interactive tool that links each of the ten priority occupations to specific learning outcomes, maps learning outcomes to existing course modules at partner institutions, identifies gaps between current provision and employer requirements, and provides the Tool Currency Annex in a format usable for curriculum review.

7.1.3 For Employers: Talent Intelligence Tool

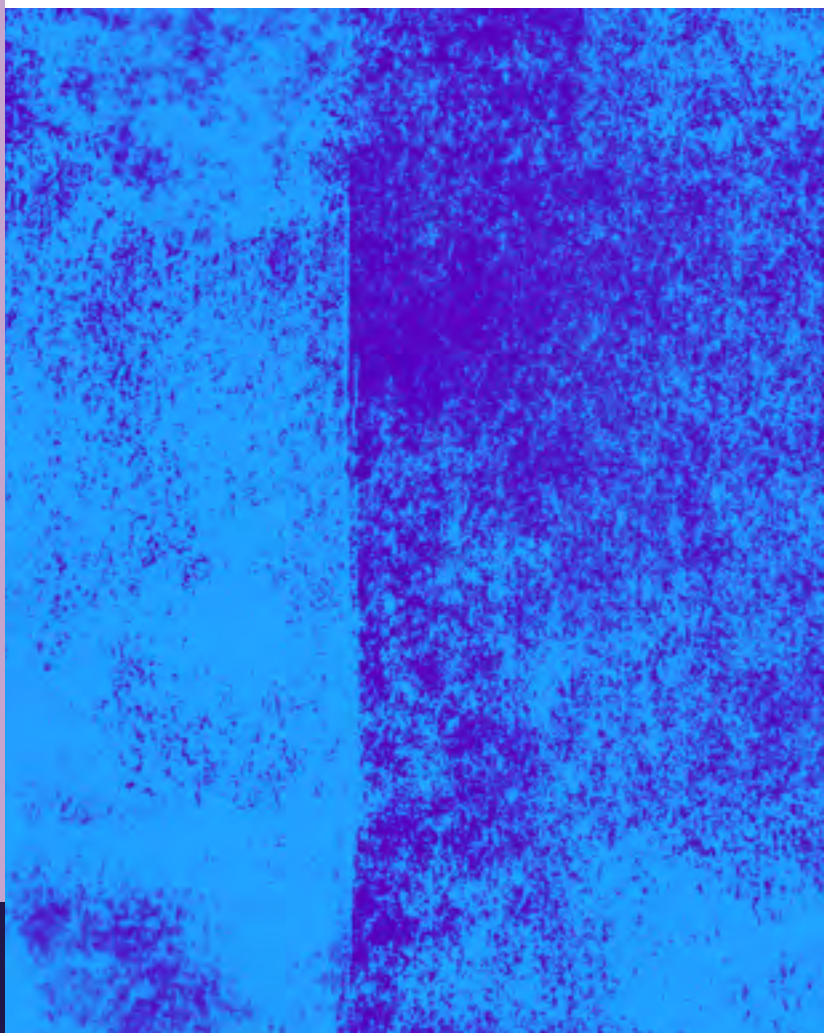
A practical tool that translates studio job titles into framework occupational profiles, provides skills gap analysis for existing team members, links to training providers offering relevant programmes, and enables vacancy posting using framework vocabulary (improving matching quality).

7.1.4 For Job Seekers and Learners: Career Pathway Navigator

A simple, intuitive tool (modelled on a search engine rather than a bureaucratic database) that shows what the next role requires in plain language, identifies the specific skills gap between current profile and target role, links to training providers and online resources, and provides an RPL self-assessment tool for self-taught practitioners.

7.2 Language Strategy

The three-phase translation strategy set out in Section 3.3 is a prerequisite for the adoption goals described here: a tool that functions only in English will systematically exclude the majority of the workforce it is designed to serve.



8. Governance Architecture

8.1 Regional Practitioner Panel

A new standing governance mechanism: a Regional Practitioner Panel meeting quarterly (online) to review the Tool Currency Annex, validate new occupational standard proposals, provide input to ESCO extension proposals, and connect with SGA, MonteGames, and equivalent associations in each country.

Proposed composition

- 2 practitioners per country (12 total), nominated by industry associations
- 1 representative from an international employer
- 1 representative from SGA
- 1 British Council representative (secretariat)
- 1 CEDEFOP or ETF representative (EU alignment)
- 1 World Bank representative

Table 17 Update cycle

Component	Update Frequency	Mechanism
Tool Currency Annex	Annual	Employer survey + Practitioner Panel review
Occupational profiles	Biennial	Practitioner Panel + ESCO alignment check
ESCO extension proposals	At each ESCO update cycle	Practitioner Panel + British Council submission
NQF integration progress	Annual	Country consultant reports
Workforce readiness scores	Annual	Employer survey (standardised questionnaire)

9. Immediate Action Plan

Priority actions for dissemination meetings. The following should frame every country-level dissemination event.

In Every Country

- Present the workforce readiness scores and the three universal gaps (Production Logic, Missing Middle, ESCO Invisibility): frame as evidence, not criticism.
- Present the Technical Artist profile as the single most important missing occupation: it resonates with employers in every country.
- Present the Production Logic competency cluster: use the 'production sprint' assessment model as the concrete illustration.
- Present SGA's workshop model as a regional template: it is the only employer-validated training intervention in the research.

Country-Specific Actions

Serbia

- Propose Sector Skills Council initiative for creative-tech
- Present SGA micro-qualification mapping
- Address the knowledge integration failure between relocated and local professionals as a specific framework objective: the language barrier between the relocated senior cohort and local professionals, rather than any structural unwillingness to share knowledge, is the specific mechanism the proposed cross-community exchange programme must be designed to address

Montenegro

- Propose micro-qualification pilot under May 2025 MQF Amendment
- Develop Tehnopolis as delivery hub
- Recommend establishment of Creative and Digital Industries Sectoral Commission

Albania

- Present Train-the-Trainers programme as immediate priority
- Propose NAVETQ engagement

Kosovo

- Present AAB College partnership formalisation
- Propose KAA accreditation pathway
- Flag website infrastructure issue

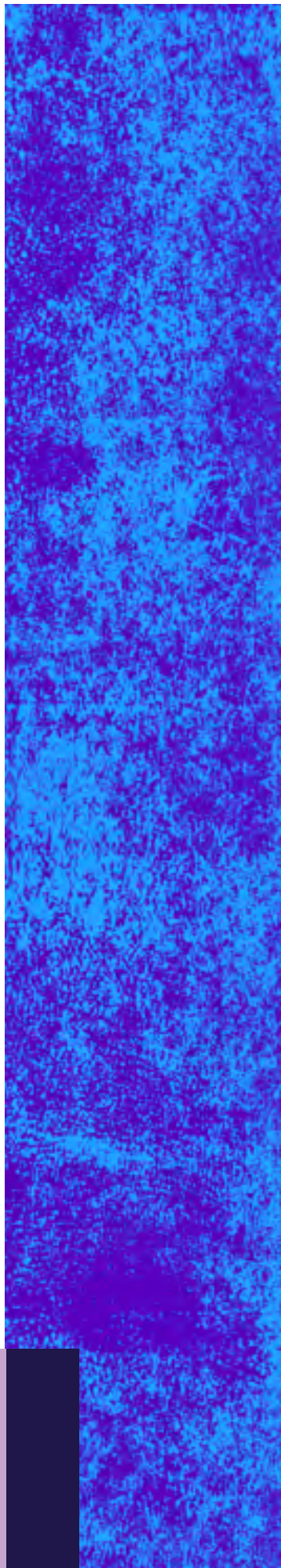
Bosnia and Herzegovina

- Present INTERA micro-credential model
- Raise legal barriers to monetisation as parallel policy issue

North Macedonia

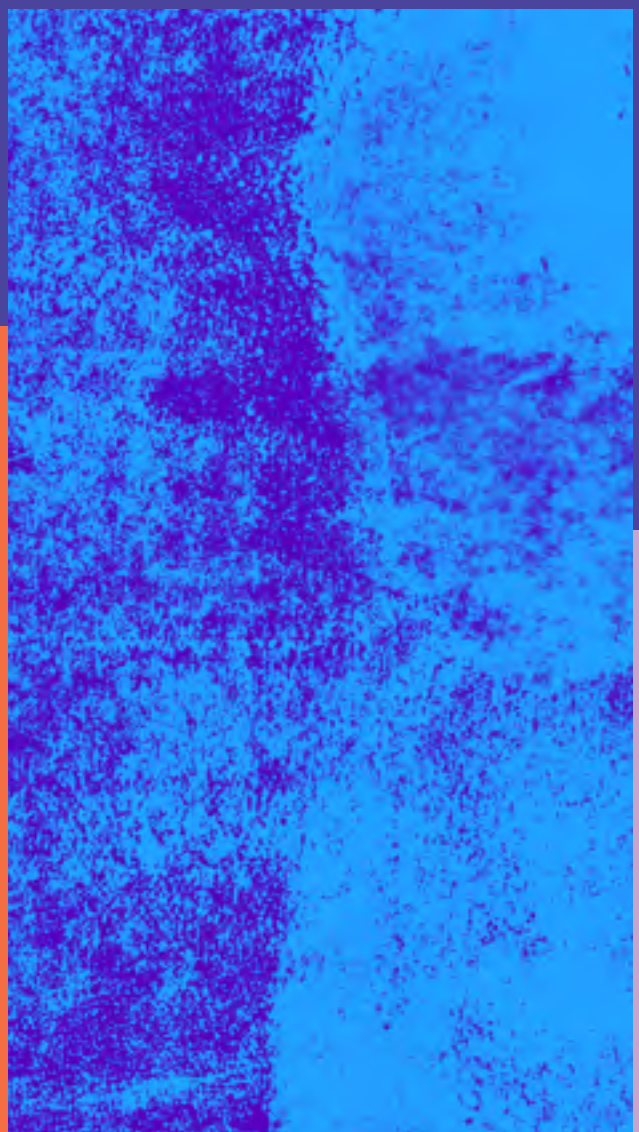
- Present occupational standards priorities (Technical Artist, Game Designer, Level Designer, Matchmove Artist, Game Developer)
- Engage Regional Practitioner Panel on regional dashboard co-development
- Ensure the theoretical foundations perspective is represented in Practitioner Panel composition.

The region has talent. It has motivation. It has creativity. What it lacks is the infrastructure to connect that talent to the global market: the qualifications that make it visible, the training that makes it production-ready, and the studios that give it somewhere to grow. This framework is the beginning of that infrastructure.



Appendix A

ESCO Background and Taxonomy Analysis



A.1 What is a skills taxonomy?

A skills taxonomy is a structured classification system that organises occupations, skills, and competencies in a standardised format, providing a shared language across policy, education, and industry. For the Western Balkans creative economy, this shared language is currently missing: employers, educators, and qualifications bodies describe the same roles in incompatible terms, making talent development, hiring, and policy intervention systematically harder than they should be.

An optimal taxonomy framework is not a single-purpose tool. It must be multipurpose by design, addressing a set of distinct but interlocking priorities: informing policy with actionable data; aligning education with industry requirements; standardising skill language across institutional and national boundaries; enhancing career mobility; streamlining talent management; and driving innovation by making interdisciplinary collaboration easier to identify and resource. A taxonomy for the Western Balkans must work for policymakers, educators, employers, and workers at the same time. Each group needs different things from the same data. Designing for all four from the outset is the central design requirement, not an added complexity.

A.2 ESCO: Structure, strengths, and limitations for this sector

The European Skills, Competences, Qualifications and Occupations classification (ESCO) is structured around three interconnected datasets:

- Occupations Pillar (3,000+ occupational concepts anchored to ISCO-08)
- Skills and Competences Pillar (nearly 14,000 concepts, distinguishing between skills, knowledge, language skills and transversal competences)
- Qualifications Pillar (now migrated to the Europass platform, where countries publish their national qualifications databases mapped to EQF).

ESCO's advantages for the Western Balkans are substantial

- EU standard alignment
- Support for the accession pathway
- Interoperability with EURES and Europass
- Open data under Creative Commons
- Multilingual architecture supporting 27 languages
- Active Commission maintenance.

Adopting ESCO rather than building a bespoke taxonomy saves years of development time and significant public investment.

However, ESCO's limitations for games, VFX and animation are specific and operationally significant:

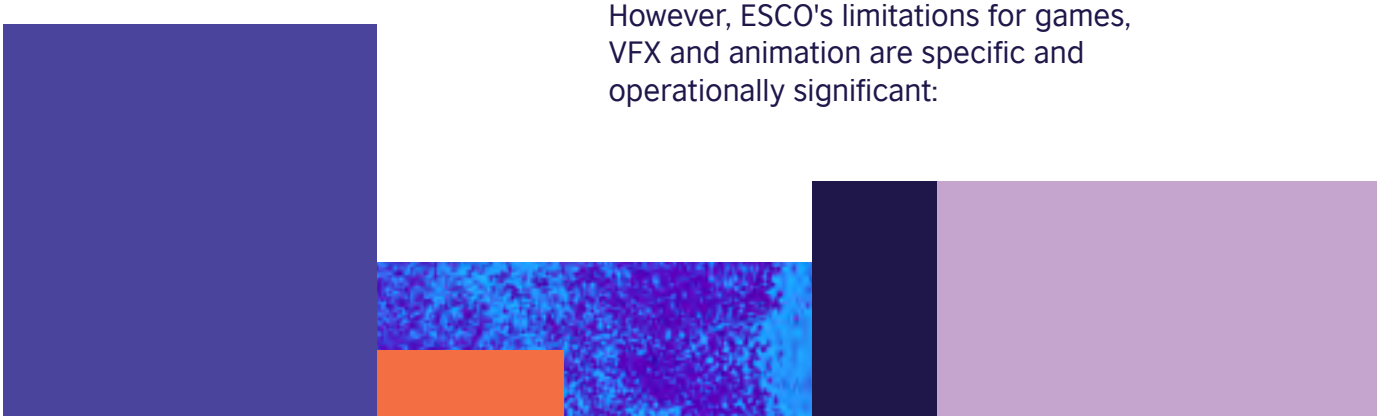


Table 18 ESCO vocabulary limitations

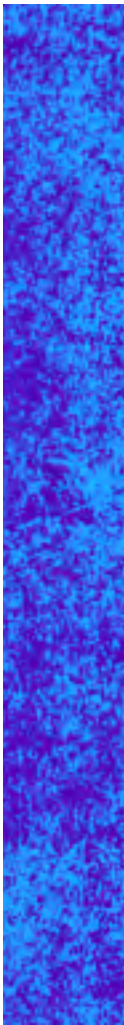
Role (Industry Term)	ESCO Mapping	Coverage Quality
Game Designer	Multimedia Designer (2166.2)	Partial: skills profile outdated
Technical Artist	No dedicated concept	Absent
VFX Supervisor	Film Director (2654.1) / adjacent	Poor: category mismatch
3D Animator	Animator (2651.1)	Moderate: roles collapsed
Pipeline TD	Software Developer (2512)	Very Poor: function misread
Real-Time VFX Artist	No dedicated concept	Absent
Rigger	Within Animator concept	Partial: no distinct profile
Concept Artist	Graphic Designer (2166.1)	Partial: limited overlap
Sound Designer (Games)	Sound Designer (2651.3)	Moderate: reasonable fit
Games Producer	Film/Media Producer (adjacent)	Weak: sector context absent
Matchmove Artist	Graphic Designer (adjacent)	Poor: camera science absent
Virtual Production Specialist	No dedicated concept	Absent

ESCO's update cycle creates a measurable structural lag. The most recent major release (May 2024) drew on AI-assisted extraction from job advertisements published between 2020 and 2024, meaning ESCO's best current data is already between one and five years old. For games and VFX, where generative AI has fundamentally altered production workflows since 2022, this lag is not a minor version issue; it is a problem of missing skills relationships.

A.3 Taxonomy development methodology

This work identified a hybrid ESCO-anchored taxonomy as the most appropriate foundation for skills classification across VFX, games and animation in the Western Balkans. The methodology comprised four phases:

- **Desk research and taxonomy review:** Sixteen taxonomies reviewed, spanning international frameworks (ESCO, O*NET, WEF, ILO, OECD), national systems (Singapore, Australia, Canada), sector-specific classifications (ScreenSkills, SFIA, IGDA), and commercial platforms (Lightcast, LinkedIn Skills Taxonomy).
- **Meta-analysis of data owners:** Analysis of relevant country and institutional data owners at European and international level who currently collect, collate or publish skills and occupational data, assessing quality, coverage and accessibility.
- **Exploration of alternative data sources:** Initial exploration of labour market intelligence platforms, professional network data, online job posting analysis and regional employment portals capable of supplementing institutional data holdings.
- **Selection and preparation of sample skills profiles:** Two example profiles developed: one based on an existing ESCO occupation (Game Developer, augmented with sector-specific skills) and one for an occupation not currently in ESCO (Matchmove Artist), demonstrating both dimensions of the augmentation strategy.



Appendix B

Best Practice and Lessons Learnt

B.1 Singapore as Best-in-class example

The Singapore Skills Framework (SFw) is the international reference point throughout this project. Ten lessons are drawn from the Singapore experience, each directly applicable to the Western Balkans context:

1. **Adopt and adapt: don't build from scratch, and don't expect any single framework to do everything**

   Every framework reviewed - ESCO, O*NET, Lightcast, SFw - has significant gaps. A hybrid approach (structural backbone + dynamic data layer) consistently outperforms single-framework adoption. For a project spanning six countries, extending an established framework like ESCO is faster, more credible, and more sustainable than starting from a blank page.

2. **Singapore's competitive advantage is policy integration, not the taxonomy itself**

   The SFw is embedded directly into Industry Transformation Maps, SkillsFuture funding, education provision, and union engagement simultaneously. Skills data feeds national economic planning rather than functioning as a labour market statistics exercise. Taxonomies that sit alongside economic strategy as an afterthought, rather than wired into it, consistently underperform.

3. **Co-creation beats desk-based development**

   Singapore brought together employers, unions, educators, and government to co-design the system together, not as consultation, but as genuine co-ownership.

4. **Job-advert-based taxonomies systematically undercount creative industries**

   Freelance, portfolio, and project-based work patterns mean the most important creative roles barely appear in job postings. Only a handful of relevant jobs could be found on the main Western Balkans job boards.

5. **Taxonomies die without governance and updates**

   ESCO's 2–3 year major update cycle makes it sluggish for emerging skills. Having robust update mechanisms matters as much as the initial design.

6. **Singapore aligned education directly to the taxonomy**

   Career pathways in the SFw map explicitly to training programmes, polytechnic courses, and credit-funded upskilling. The taxonomy is a curriculum planning tool, careers advice tool, and funding allocation mechanism simultaneously.

7. **Interoperability is non-negotiable but rarely achieved**

   Any new taxonomy must be designed for cross-walking from day one, not retrofitted.

8. **O*NET has the best granularity for creative roles but cannot be adopted directly**

   It is US-specific and not a recognised European standard – but its detailed competency profiles for creative occupations should be used as a reference source.

9. **Language matters.** People describe their skills in LinkedIn/CV language, not ESCO codes. Any operational taxonomy needs a translation layer.

10. **Design for multiple audiences and embed in existing workflows**

    The same underlying data should serve policymakers, educators, employers, and individuals; but each needs a different view.

B.2 Australia case study: Don't build what you cannot sustain

The Australian National Skills Classification (NSC) was launched as a beta in 2021, reached version 3.0 by late 2023, and was effectively deprecated in June 2024 – in use for approximately 2.5 years. The NSC borrowed heavily from O*NET and was developed in 8–12 months, which led to it being criticised as not fit for purpose. The key lessons:

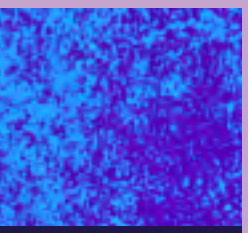
- **Insufficient stakeholder buy-in from the start**: developed as a desk-based exercise without deep government, industry, union, and education provider involvement.
- **Fragmented framework problem**. the classification sat alongside the national occupational standard and qualifications framework without properly integrating with either, forcing users to navigate multiple overlapping systems.
- **Not comprehensive or adaptable enough**: could not keep pace with rapidly changing job requirements or cross-sector transferability.
- **Limited real-world use cases:** remained an analytical tool rather than something embedded in hiring, training, or career guidance workflows.

The replacement taxonomy is being built from first principles using lessons from the failed classification and international best practice, with interoperability, stakeholder co-design, and multiple use cases baked in from the start. This is the trajectory the Western Balkans framework must avoid by getting the design right at the outset.

B.3 Taxonomy failure patterns: summary

The issues associated with previous skills taxonomy work can be summarised as four recurring failure modes:

- **Overambition without resources:** a national taxonomy that meets the needs of policy, educators, industry and learners is a major undertaking requiring years, not months, and ongoing maintenance investment.
- **Limited stakeholder engagement:** data owners becoming defensive about how 'their' data would be used; internal organisational friction; initial scoping limited to friendly stakeholders with resistance to broadening.
- **Too late to the party:** when commissioned work begins after partner organisations have spent years developing their own isolated taxonomies, the business case for a cohesive shared taxonomy collapses.
- **Limited visibility into data practices of other organisations:** domain experts unaware of other key information owners undervalue the data collected and underestimate the effort required – severely limiting chances of a joined-up approach.



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