DIGICRAFT 5.0

Descriptive Report on the Pilot Path

DigiCraft5.0 Project

Project No. 2025-1-IT01-KA210-VET-000362226

Introduction

The DigiCraft5.0 project — *Bridging Artisanship and Industry 5.0* — falls within the framework of Erasmus+ KA210-VET Small-scale Partnerships and was conceived to respond to a particularly relevant training need today: supporting the world of vocational education and training, craftsmanship, and small-scale manufacturing toward a fuller integration of traditional skills, digital technologies, and sustainability principles.

DigiCraft5.0 aims to bridge the gap between artisan know-how and the transformations introduced by Industry 5.0 by building an innovative curriculum centered on digital fabrication, computational design, sustainable manufacturing, and, more broadly, new skills for contemporary production. From this perspective, the project does not merely propose a simple technical update, but aspires to define a training model capable of connecting creativity, design, digital tools, production, and the enhancement of skills in a European perspective.

The partnership is composed of Medaarch srl stp, as coordinating entity, and EfVET — the European Forum of Technical and Vocational Education and Training — as a strategic partner for liaison with the European VET system and for the dissemination of results. Within this framework, the pilot represented the concrete experimentation phase of the curriculum, that is, the moment when the project's theoretical and methodological framework was tested through a real, structured, and monitored training pathway.

Purpose of the pilot

The pilot, one of the planned components of the project, is one of its core activities, aimed at testing the developed curriculum in the field and gathering useful elements for its subsequent refinement and integration into the project's MOOC. Therefore, the function of the pilot was not exclusively delivery-oriented, but also observational and evaluative: through the training pathway, the aim was to verify the coherence of the content, the didactic progression, the adequacy of the methodology, and the curriculum's ability to respond to the needs of learners, professionals, and sector operators.

The information available online confirms that DigiCraft5.0 has been presented as a project aimed at training a new professional profile able to operate across digital design, fabrication, and the culture of making, with strong attention to applied innovation. In this sense, the pilot represented not only an internal project experimentation phase, but also a demonstrative action useful for showing the feasibility of an updated training offer aligned with changes in work and production.

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Training Profile Proposed

The pilot pathway was structured around the profile of the Expert Designer in Digital Fabrication, a highly specialized profile integrating digital design skills, material knowledge, the use of machinery and tools for advanced manufacturing, prototyping capacity, and sensitivity to process sustainability.

This professional profile, characterized by a strong innovative connotation, is able to operate with CAD/CAM tools, simulation and rapid prototyping processes, CNC machining, 3D printing systems, and design approaches that combine craftsmanship and innovation. The project’s logic itself emphasizes that Industry 5.0 requires professionals capable not of passively undergoing technological change, but of governing it, keeping the role of the person, creativity, and technical knowledge at the center.

The pilot was designed as a pathway that is not narrowly sectoral, but transversal and composite, capable of connecting design, technical, productive, and methodological competencies. This feature is particularly significant because it makes the curriculum potentially applicable in various areas of vocational training and innovation applied to craft and manufacturing contexts.

Structure and Schedule

The lessons began on 25 February 2026 and continued until 19 June 2026, following a program divided into an initial phase of distance learning and a final phase of in-person activities at the CAD.

The early sessions were carried out mainly in online mode, with meetings scheduled mostly between 14:00 and 18:00, while the concluding in-person activities were organized from 10:00 to 17:00. This structure made it possible to build a gradual pathway in which the online dimension supported accessibility, continuity, and traceability of attendance, while the in-person laboratory dimension enabled the practical consolidation of learning outcomes.

The course schedule essentially confirms this approach, presenting the image of an extended, well-paced pathway progressively oriented toward practical application.

Content and Organization

The analysis of the training schedule shows a coherent sequence of modules, designed to guide participants from the acquisition of the fundamentals of digital design to the in-depth study of more advanced tools and processes. Among the contents analyzed are Fundamentals of Digital Drawing and Modeling, Drawing Order Lesson Pills, Solid Lesson Pills, Radial Generation, Modular Array, Module and System, SubD, Introduction to Digital Fabrication, FDM 3D-Print, FDM SLA, Guide to Ultimaker Cura,

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Economics of Digital Manufacturing, Introduction to PLA Atelier, and further ateliers related to materials and production.

Taken together, these modules outline a strongly progressive teaching pathway in which theory, practice, and application are closely integrated. The point of interest lies not only in the breadth of the topics addressed, but above all in their coherence with the project's objectives: to develop competencies capable of connecting design, modeling, fabrication, sustainability, and the culture of digital transformation.

Teaching approach and support

One of the most distinctive aspects of the pilot is its blended approach, which successfully combined organizational flexibility with a strong laboratory orientation. Online activities made it possible to ensure continuous, documented, and widespread participation, while the in-person days strengthened the experiential value of the pathway, allowing participants to engage with the physical laboratory environment, materials, and actual manufacturing processes.

The continuity of the teaching staff contributed to the coherence of the pilot and supported participants through a progression that, module after module, required consolidation, continuity, and specialized guidance.

The stable presence of trainers is also a significant qualitative factor, because it shows that the pilot was not conceived as a simple sequence of isolated interventions, but as a guided pathway with a clear didactic framework and a recognizable reference structure for participants.

Participation and completion

Overall, the pilot involved 32 selected participants, who took part in a structured and demanding pathway characterized by didactic continuity, a plurality of modules, and a combination of theoretical and applied learning. The final outcome of the course shows that the micro-credentials certificate, as reported, was obtained by 21 participants.

This result is significant from several perspectives. On the one hand, it testifies to the pathway's capacity to support a substantial group of participants through to completion; on the other, it confirms that the training offer maintained an adequate level of robustness and engagement throughout the experimentation period. In a pilot-project perspective, the figure of 21 certificates should be read not only as a numerical outcome, but as an indicator of the curriculum's practical feasibility and its ability to generate qualified participation.

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Value of the pilot

Considered as a whole, the DigiCraft5.0 pilot pathway has a value that goes beyond the single training experience. It is the moment in which the project transformed its stated objectives into a real learning process, testing content, timing, tools, methodology, and the ability to engage target groups. DigiCraft5.0 is a project oriented toward building a bridge between craftsmanship and Industry 5.0. The pilot carried out appears to confirm this approach, because it proposed a pathway in which design, digital manufacturing, materials, sustainability, and innovation were not treated as separate compartments, but as components of a single training ecosystem.

From this perspective, the pilot can be interpreted as a successful experimentation of a teaching model that values making, design, and digital transformation in a professional key. The connection between theoretical lessons, exercises, technical tools, and the final laboratory experience provides the image of a pathway capable of bringing participants closer to a contemporary productive culture in which artisan knowledge engages with digital technologies without being replaced by them.

Organization of work, technologies employed, and best practices identified

The participants were organized into five effective working groups, maintained consistently throughout the three main workshops — Ceramics, Wood, and PLA/Biopolymers — within which each group developed one project per workshop, for a total of fifteen collective projects. The design themes addressed were, respectively, an organizer for the PLA/Biopolymers workshop, a vase for the Ceramics workshop, and a lamp for the Wood workshop. In addition to these activities, individual work was carried out within UC6, dedicated to the use of generative artificial intelligence in design: each participant developed the concept of a chair, from the definition of the design idea to the generation of images through at least two different generative AI platforms, such as Gemini and Yeri.ai, used both in text-to-image mode and in image-to-image mode, in order to explore variants and progressively refine the selected design direction. Subsequently, starting from a selected image, an initial three-dimensional model was generated using Meshy.ai, employed as an image-to-3D tool, and then refined and corrected in Rhinoceros 8, both online and during the in-person week, until preparation for slicing and prototyping at 1:10 scale using Bambu Lab desktop 3D printers. From a technological and material perspective, the PLA/Biopolymers workshop involved the use of FDM 3D printing with PLA filament; the Wood workshop experimented with laser cutting on multilayer panels of varying thicknesses, testing interlocking, assembly, and gluing solutions, with particular attention to dry assembly; the Ceramics workshop used an LDM Clay 3D printer, focusing on the optimization of geometries and files for ceramic printing. Within UC6, generative AI tools, Meshy.ai for the image-to-3D process, Rhinoceros 8, slicing software, and desktop 3D printing were also employed. Almost all projects were physically realized or prototyped, confirming the strong integration between digital design and concrete fabrication.

Best Practice

The overall structure of the pathway demonstrated a remarkable degree of didactic consistency and progressive design development. The continuity of the working groups fostered the development of stable collaborative dynamics, within which forms of responsibility, role distribution, and peer exchange were consolidated, positively affecting both decision-making processes and the development of transversal skills. At the same time, the modular structure of the activities made it possible to maintain an effective balance between experimentation, verification, and revision, allowing participants to approach the different phases of the design process in a conscious manner, from the generation of the idea to its translation into a concrete artifact.

A further qualifying element is represented by the central role assumed by UC1, dedicated to 3D modeling with Rhinoceros, which provided a shared methodological foundation for the entire pathway. This module enabled even participants who already possessed prior skills to acquire more advanced strategies, more efficient commands, and more refined methods for optimizing modeling times and improving the formal quality of the outputs. In this sense, UC1 played a preparatory and transversal role, providing tools useful both for the design of the workshops and for the subsequent integration with prototyping and technical refinement activities.

The continuous transition from digital modeling to physical realization was one of the most significant aspects of the experience, as it made it possible to carry out an immediate verification of geometric criticalities, material limitations, and the construction solutions adopted. Through successive tests, corrections, and adjustments, the students were able to understand in concrete terms the relationship between form, function, technology, and the production process, developing a stronger design awareness. In particular, the combined use of the technologies available in the various workshops promoted situated learning, based on direct observation of the characteristics of the materials and on the experimentation of construction solutions consistent with the objectives of each project.

UC2, dedicated to digital fabrication and technologies, also offered a broad and comparative overview of the FabLab's production possibilities, including tools and processes not directly used in the individual workshops. The in-person phase was particularly important in allowing participants to observe the real functioning of the machines, understand their operational potential, and engage with the technical contingencies that characterize advanced production contexts. This experiential dimension helped strengthen the understanding of the design process as a whole, integrating aspects of design, fabrication, cost, machine time, and the potential commercial value of the objects produced.

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Particularly noteworthy was also the use of AI as a support tool for the designer's work, rather than as a substitute for design activity. The participants were able to experience the value of artificial intelligence in the visual exploration phase, in the generation of formal alternatives, and in the construction of an initial three-dimensional prefiguration, while at the same time understanding the need to keep critical thinking, selection skills, and technical competence at the center of the final outcome. The pathway developed within UC6 clearly highlighted this progression: from the designer's idea to its translation into AI-generated images, from the first digital model to corrective intervention in Rhinoceros, and finally to slicing preparation and prototype printing. Even technical setbacks, such as temporary malfunctions of some machines, acquired significant educational value, as they made the concrete and non-idealized dimension of laboratory work evident, encouraging adaptability, problem-solving, and critical reading of production processes.

Final considerations

DigiCraft5.0 pilot can be described as a structured, coherent training pathway substantially aligned with the objectives declared during the design phase. Its temporal organization, the quality of the topics addressed, the adopted blended methodology, the continuity of teaching, and the final result in terms of certified participants confirm the solidity of the experience implemented.

The final figure of 21 certificates obtained out of 32 selected participants is particularly relevant, as it provides a concrete measure of the pilot's outcome and makes it possible to document the completion of the pathway clearly. Overall, the DigiCraft5.0 pilot thus presents itself as a meaningful phase of the project, useful not only for validating the curriculum, but also for the future dissemination of results and the possible replicability of the training model in other VET contexts interested in integrating craftsmanship, digital innovation, and sustainability.

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