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How can VET providers innovate and interconnect traditional and creative craft industries through 3DP

EXECUTIVE SUMMARY

INTRODUCTION

A full study report was prepared to respond to the first objective of the ACCESS 3DP project, which is to identify the skills mismatched between the craft and traditional industries in relation to AM technologies.

This executive summary will present the main points of the full study, which will be published in autumn of 2021.

PRELIMINARY STUDY

The report first **illustrates a preliminary study** carried out by the project partners, which shows the interest in adopting 3DP and the opportunities that this technology presents for all types of industrial and craft businesses. It also provides concepts and guidelines to consider in the following sections of the study, including:

- A definition of creative craft businesses (innovative and users of 3DP) and traditional craft businesses (concerning the manual know-how passed down through generations and to the business sector), agreed by the partners of ACCESS 3DP and adopted in the scope of the project;
- The various sectors concerned (furniture, jewellery, woodworking, leather, footwear, metal, etc.) that give the opportunity to target a development approach for the skills by focusing on the activities.
- Examples of inspiring creative businesses for traditional craft businesses;
- Specificities by country, in the use of 3DP and in national support programmes, which need to be considered.

BENCHMARK ANALYSIS

Next, the report illustrates a **benchmark analysis of 3DP and Advanced Industrial Robotics (AIRs)** training courses available in Europe and targeting, amongst other sectors, also the craft one. The analysis reviews the offer proposed by 64 training organizations based in 27 European countries and covers, in total, 70 training courses. This European benchmark highlights possible and desirable adaptations of the training programmes for greater diffusion of the technology in the craft sector.

One notable result of the benchmark is that there is a great diversity of 3DP training courses, both in terms of technological content (i.e. software, 3D printers, materials), as well as duration, costs, and target audiences. Nevertheless, almost 90% of them are not offering training on AIRs. Another important point to notice is that 57% of the training courses are partly appropriate to the craft sector and almost 6% are not appropriate at all to the craft sector.

There is therefore a strong potential for the development of courses that are more suited for craftsmen and strong potential as well to link the experience of creative craft companies with traditional craft industries. A new offer of training on AM for craft entrepreneurs should address some identified deficiencies.

It has been noticed that the training programmes are not very detailed, and it might be helpful to develop a new format for the training programmes to identify easily, for example, what technology or software is adapted to the project. It may be also interesting to develop new contents about different materials used in AM such as their applications, the specificities of each material, the limits, the difficulties, the costs related to their use in 3DP and others.

As there are many courses already covering technical subjects and skills in their training programmes, there is a noticeable lack of training courses covering other related topics, such as transversal skills. Based on the example of the trainings addressing these types of skills, it appears interesting to develop a training offer that focuses on critical and innovative thinking, project management, and organizational skills, to stimulate creativity and facilitate the adoption of new technology, like the 3DP technology.

The majority of the courses usually aims to provide general and basic knowledge about 3DP and its complete digital chain, applied in all of the sectors. Thus, for ACCESS 3DP it would be interesting to develop a training format where the learner can choose the training modules and adapt the level of the training to their level of knowledge of the technology and their 3DP project.

As for the prerequisites, when they are necessary, they seem to mainly relate to simulation software, digitization, and prototyping. Introducing additional prerequisites might be helpful for potential users, like craftsmen. For example, for the ones that are not completely at ease with the English language (which is dominant for using 3DP technology), a glossary of key terms translated in the languages of the partner countries can be developed.

Finally, access to 3DP and the experiences of creative companies can be facilitated for craft companies by free access to content, illustrated by examples of peers and with possibilities of direct exchanges between creative and traditional craft entrepreneurs through business to business (B2B) meetings, networking events or online chats, which facilitate the development of key competences on AM by sharing best practices.

USE AND NEEDS IN THE FIELD OF 3DP

The third and final part of the report presents an analysis of the **use and the needs of 3DP**, which has been carried out by directly questioning the final beneficiaries of the training offer on 3DP and AIRs. The replies were provided by 46 European businesses, based in 7 European countries, which either are already using this technology or are potentially interested in adopting it, but also by other types of organizations such as training providers on 3DP and AIRs and similar stakeholders. Considering their feedback, the main recommendations and proposals to consider in the development of the ACCESS-3DP Joint curriculum are as follows:

A) Regarding the **content of the training**:

- Explain and show the added value brought by 3DP and its applications to businesses and provide information to give visibility to the network of actors who can be mobilized to use 3DP;
- Rely on the concrete and varied uses of 3DP already existing to arouse interest and show the possible opportunities for traditional companies;
- Rely on the needs identified by companies to build the content of training modules: design and software modelling, 3DP as a source of creativity, multifactorial approach to their

business project and the technology available (market-uses/technical/financial), choice of the right material for their 3DP project;

- Raise awareness and inform on the security issues related to the use of 3DP equipment.
- B) Regarding the **form of the training**:
- Raise awareness on the training providers offering trainings on issues related to 3DP and AIRs and facilitate the link between craft entrepreneurs and the actors of the local economic and innovation ecosystem that can support the development of a 3DP project;
 - Give examples of best practices from the craft sector to show to the enterprises how 3DP can be coupled with robotic technologies to generate new solutions and application for production automation and highlight the benefits of associating 3DP and AIR;
 - Integrate practical workshops into the training programme;
 - Raise the level of awareness and skills on AM by favouring highly operational trainings including scenarios, as well as 3DP practical examples and/or exercises.
- C) Regarding the **access to the training**:
- Allow for the choice on different levels of trainings, with a focus on the basic and intermediate levels.

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