



Promoting digital transformation  
and social innovation in VET  
for better access of deaf students  
to the labour market

2022-1-PL01-KA220-VET-000086953

# Methodology for guiding schools in introducing the 3D4DEAF programme





## **3D4DEAF:**

Promoting digital transformation and social innovation in VET  
for better access of deaf students to the labour market

**Author (s): European Digital Learning Network ETS**

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**Project acronym:**

3D4DEAF

**Project title:**

Promoting digital transformation and social innovation in VET for better access of deaf students to the labour market

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## 1. Introduction

### Why 3D4DEAF: an ambitious set of goals

The project arises from the current urgent need to establish training programmes for students with deafness and hearing impairments, as the number of services and programmes accessible to deaf or hearing impaired people for integrating into the digitalized job market is severely low. The EU Disability Strategy 2021-2030 calls for the creation of inclusive, accessible VET programmes focused on filling skills gaps, particularly the digital competences one, often by establishing a cooperation with social enterprises for favouring labour market inclusion. According to the Council Recommendation on VET, hence, designing courses that are inclusive and accessible to disadvantaged groups while simultaneously fostering technical and digital skills for VET educators in order to achieve digital market transformation is a top goal.

The project in fact focuses, among all, on Social entrepreneurship which is an expanding subject of study since it stands for altering ideals, creating inclusivity, and working together towards sustainable growth via tackling social and environmental challenges: 3d4deaf is an Erasmus+ co-founded project that assures the Inclusion of all as it focuses on social innovations that have the potential to alter the disability sector by offering equitable access and opportunity. Nevertheless, 3D printing and modelling is another field explored by 3D4DEAF: technological improvements and the revolutionization of industrial outputs have created a plethora of labour opportunities. In particular printing in 3D has the potential to revolutionise the nature of occupations by allowing for remote, flexible, and on-demand labour: for such reason 3D technology - anew branch of Additive Manufacturing- fits well all those vulnerable groups such as deaf and hearing impaired people who are traditionally at a major risk of exclusion from labour market.

Given those premises, the 3D4DEAF project brings together a transnational team of specialists to develop, manufacture, and pilot-test a TOOL KIT that will enable VET teachers to promote 3D technologies and social entrepreneurial (SE) skills to students with deafness/hearing impairments. The primary goals are to:

As stated in the 2018 Digital Action Plan, introduce non-formal learning opportunities in the form of extracurricular activities.

Plan to provide a complete training package for VET teachers and students based on real-world demands.

Identify and train persons with SE talents to translate social demands into business ideas.

Offer careers paths and professional opportunities and journeys to VET students hearing impaired and/or deaf making them digital competent and upskilled

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Offer a good practice for similar projects by assuring sustainability of results and tools;

### The products of our project: innovation and inclusivity are guaranteed

#### EUROPEAN MONITORING REPORT & 3D4DEAF DUAL TRAINING PACK: INTRODUCING 3D TECHNOLOGIES IN TEACHING AND LEARNING FOR A SUSTAINABLE FUTURE

This product starts with a **National Report** in each country represented by the consortium of the project. The results of the Reports are summarised and explained in a Comparative Index: this document is in fact based on the National Report in each country and Peer Review illustrating in a form with questions and infographics and aims at illustrating the needs and gaps in VET education for Impaired hearing people at a transnational level. At a later stage the information gathered in the **Comparative Index** will be included in the PLATFORM.

Study visits are organised in partners' countries and a **practical Guidebook** aiming to support empowerment and awareness of people with hearing impairments in the labour market is produced with videos which emphasis working environments in Industry 4.0 jobs.

The project also includes a **Dual Competence Framework** for VET-I and VET-C students based on the ENTRECOMP FRAMEWORK of the European Commission aiming to define the benchmarks and indicators to acquire skills in 3D Technologies such as Design, Modelling and Printing- and Social Entrepreneurship: form this basis the educational programme is created. The so called **Dual Educational Pack**: the current Methodology you are now reading is under this package of activities indeed together with content -rich didactic material; videos, scenarios and lesson plans.

#### CLOUD-BASED PLATFORM AND MOBILE APP: e-LEARNING, e-ASSESSMENT, e-COMMUNITY AND 3D4DEAF ENTREPRENEURS NETWORK

The project has the objective to produce an interactive e-learning platform open cloud based and rich of features. In particular, this product will contain a **Mapping Tool** Using Google Maps to map the current workplaces available for People with disabilities, particularly those with hearing impairments/deafness, can benefit from 4.0 and 3D technology, as well as social entrepreneurship. Moreover, the cloud based platform entails an **e-DATA BANK dictionary**, which itself includes a collection of useful information as well as a dictionary of industry terms. 4.0 for getting more understanding and expertise, as well as accompanying training material, to assist VET educators in learning and teaching 3D related skills to students with hearing loss/deaf disability. Within the platform a page will be dedicated to the **e-Academy** where the DUAL training content based on the Competence Framework is available in order to provide virtual learning experience to the users. The didactic part in this product is accompanied by its relative **e-Assessment** based on the **Open Badges eco-system** for certifying online skills and competencies. The app will create hence a **Network of**

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**entrepreneurs** to connect professional interests of students with entrepreneurs and give assistance and counselling services in their endeavours. Another important feature of the app will be the so called **e-forums**, that is to say a chat room and a general forum for stakeholders -VET teachers, students, school administrators, IT experts, professionals, and so on- to communicate. Also, an **e-Calendar** containing important virtual or face-to-face events, initiatives for upgrading digital, STEM, 3D technology skills, etc. for VET trainers and students, and work placements in industry 4.0 jobs for deaf/hard of hearing individuals on a local and European scale will be embedded in the final product: the e-learning platform will be paired with its mobile app that works in tandem to facilitate m-learning and provide simple access to job prospects in industry 4.0.

#### THE AUGMENTED REALITY GAME FOR SETTING UP A SOCIAL BUSINESS

In the last phase of the project the partnership intends to develop an **Augmented Reality Game that** will provide an innovative way for students with deafness/hearing impairments to learn key competences in entrepreneurship and transfer this at school level to ensure innovation in VET education. The AR Game will be accompanied with by its own **e-Guidebook** including important content on social entrepreneurship education as well as a 10-step Roadmap for establishing a social firm. Face to face **training** will take place in Cyprus for the consortium to study the best way to deliver the training materials to VET tutors. Following these, national countries will be the location to held workshops in order to build the final **3D4DEAF@SOCIAL HUBS** methodology to Introduce our products and programme in schools.

## 2. The Dual Educational Pack

The Consortium offers a Methodology for implementing the 3D4DEAF programme and all the procedure and tools - like the step-by-step content division, lesson plans, PPTs, interactive tools for digital books, PowToon cartoon-based learning videos- within the 3D4DEAF Educational pack.

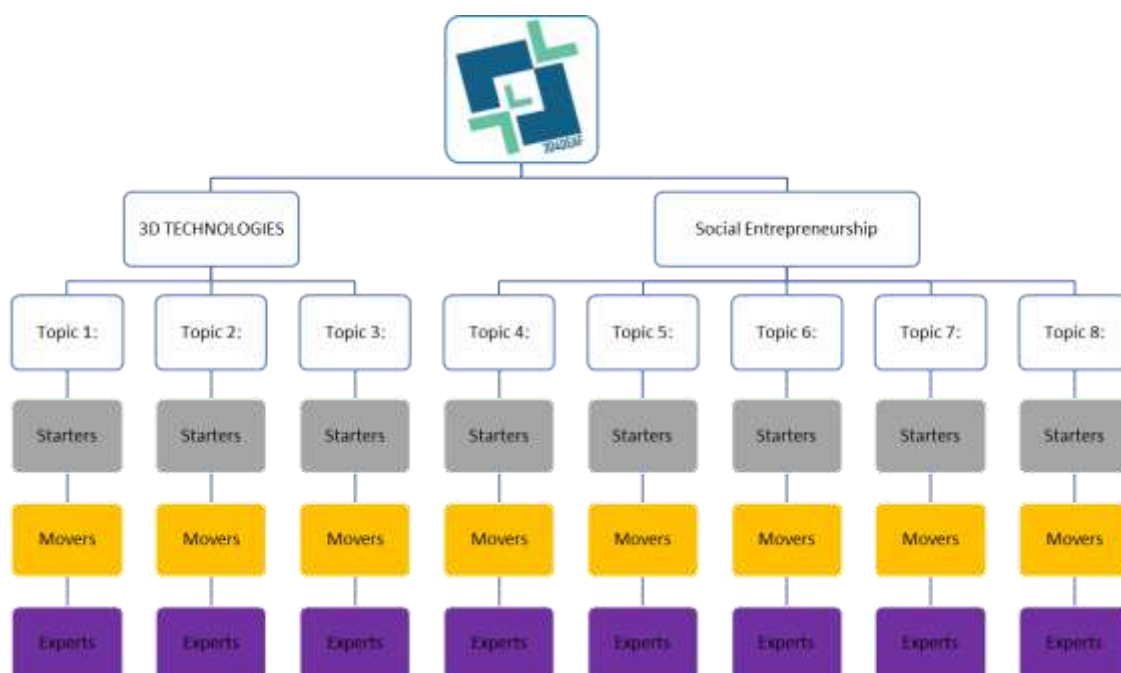
The Dual Educational Pack is theoretically based upon the Competence Framework. The Open Badges Ecosystem will be designed at a later stage on the basis of the very same.

The 3D4DEAF **Dual Competence Framework** is targeting VET-I and VET-C students and is based on the [ENTRECOMP FRAMEWORK of the European Commission](#).

The Framework serves as structure in order to define the benchmarks - such as goals and objectives for the trainers/teachers - and indicators - namely the level of competences for the learners- to acquire important skills in 3D Technologies -Design, Modelling and Printing- as well as in Social Entrepreneurship subject. In other words, this Framework represents the foundation of the education programme and didactic materials. At a conceptual level two macro areas are treated and deepened:

- 3D Technology for VET-I and VET-C: 3D printing, design, coding etc.
- Social entrepreneurial skills for inclusion in the labour market: business strategy, financial budgeting, pitching etc. based on EC 2017 ENTRECOMP

Those 2 main modules 3D technologies and Social Entrepreneurship are sub-divided in eight topics: for what concerns competence threshold, 3 levels are foreseen, from Starters passing through Movers and arriving at Experts. See the Image below:



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Now, let's see more in details the topics covered by 3D4DEAF didactic materials.

For what concerns Module 3D Technologies there is a total of 3 Topics with the following listed sub-topics per each topic (for all topics there is in fact a total of 3 sub-topics):

### **Introduction to 3D design & 3D printing**

- How does 3D printing work for the deaf people?
- Environmental impact of 3D printing
- Future of 3D printing

### **The 3D Printing Process**

- Introduction to Tinker cad online software (theoretical part)
- Introduction to CURA slicing software (theoretical part)
- Preparation of 3D Printer (material to be used, the temperature of nozzle/bed etc.)

### **Hands-on practice on software**

- Introduction to Tinker cad online software (practical part) and CURA slicing software
- Create your own design
- 3D printing (finalization)

For what concerns Module Social Entrepreneurship there is a total of 5 Topics with the following listed sub-topics:

### **Introduction to social entrepreneurship**

- Introduction to entrepreneurship & important skills of an entrepreneur
- Introduction to social entrepreneurship for deaf people
- Differences between ideas and opportunities

### **Creativity& Vision in Social Entrepreneurship**

- Introduction to creativity and why creativity is important for deaf people
- Creativity and social entrepreneurship
- Develop a vision to turn ideas into action

## Mobilizing resources

- Introduction to mobilizing resources
- What resources are needed for a social entrepreneur (material, non-material and digital)
- How to use resources responsibly

## Business Model Canva

- What is a Business Model Canvas – introduction
- What to pay attention to and what to avoid
- How to create your own canvas – step by step

## Financial and economic literacy

- Introduction to financial and economic literacy
- Basics of budgeting
- Make a plan for the financial sustainability of a value-creating activity

The Topics above will take the shape of PPTs: those are then reunited in two thematic Guide books for educators. The Guidebooks -one per Module- contains activities based on cross-curricular social and environmental scenarios. They are structured in this way: each topic treated within a Guidebook comprises 10 activities. Videos for facilitating learning and teaching are also included. In fact, 1 PowToon video is developed for each topic and 2 PowToon videos for the overall modules. The videos are accompanied by a total of 24 lesson plans available and 120 cross-curricular social and environmental scenarios with their related practical activities based on the scenarios.

### 3. Introducing the programme in schools: guidelines

How to effectively introduce the 3D4Deaf Program in VET Schools and Outside Schools?

The "3D4Deaf" program aims to provide vocational education and training (VET) students and individuals outside schools with essential skills in 3D technologies and social entrepreneurship, particularly tailored for the deaf community.

This methodology gives practical guidelines divided in numbered steps from 1 to 13 which help tutors, educators, VET teachers to fully grasp the passages needed to introduce and implement the program successfully within their School. Let's start!

#### 1. Needs Assessment:

It is necessary first of all to identify the target audience within the VET schools/school you are working in and beyond. To do so organize a series of surveys and interviews to understand the specific requirements and challenges faced by the deaf community in relation to 3D technologies and social entrepreneurship training within your School. This first step will allow you to select if you want to use all the tools and products of the Dual Educational Pack or only some of them. To do so you can refer easily to the Study visit structure [LINK](#).

#### 2. Modules and Guidebook Exploitation:

Develop the curriculum for the two main modules: "3D Technologies" and "Social Entrepreneurship."

- Structure the modules into sub-topics as provided.
- Create PowerPoint presentations for each sub-topic.

#### 3. E-Learning Material Creation:

- Develop e-learning materials for both modules, including audio-visual tools such as PPT presentations.
- Create a total of 24 e-learning materials (8 topics, 3 levels each).
- Ensure accessibility features for the deaf audience, such as subtitles and sign language interpretations.

#### 4. Guidebooks for Educators:

- Compile the PPT presentations into two thematic guidebooks for educators, one for each module.
- Include detailed explanations, additional resources, and suggestions for teaching strategies.
- Ensure that the guidebooks cater to the unique needs of deaf learners.

#### 5. Video Content Creation:

- Develop 10 cartoon-based learning videos using platforms like PowToon: 1 video for each topic and 2 overall videos (1 per each Module)
- Ensure that the videos are engaging and educational.
- Incorporate sign language and subtitles for accessibility.

#### 6. Lesson Plans:

- Develop 24 lesson plans, aligning with the modules and topics in the educational pack.
- Include clear objectives, activities, assessments, and references to e-learning materials.

#### 7. Cross-Curricular Scenarios:

- Create 120 cross-curricular social and environmental scenarios that connect to the program's themes.
- Ensure that scenarios are relevant and relatable to the deaf audience.

#### 8. Practical Activities:

- Develop 120 practical activities based on the scenarios, utilizing tools like PowToon and Camtasia.
- Ensure that activities promote hands-on learning and creativity.
- Include clear instructions for facilitators and learners.

#### 9. Pilot Testing:

- Implement the program in a pilot VET school to gather feedback and make necessary adjustments.
- Ensure that the program effectively addresses the needs of deaf learners.

#### 10. Training of Educators:

- Train educators and facilitators on how to deliver the program effectively.

- Provide guidance on accommodating the unique learning needs of deaf students.

### **11. Outreach and Promotion:**

- Promote the "3D4Deaf" program to VET schools and organizations outside schools.
- Use various marketing channels, including online platforms and deaf community networks.

### **12. Continuous Improvement:**

- Gather feedback from educators, students, and participants.
- Make necessary updates and improvements to the program based on feedback and changing technologies.

### **13. Evaluation and Assessment:**

- Assess the impact and effectiveness of the program regularly.
- Monitor the progress and achievements of deaf learners.
- Use evaluation data to refine the program further.

By following these guidelines, the "3D4Deaf" program can be introduced successfully in VET schools and extended to individuals outside the school system, ensuring that deaf learners gain valuable skills in 3D technologies and social entrepreneurship while promoting accessibility and inclusion. This is exact the journey divided in numbered steps whom the Consortium of the project has been following.

## **4. The sustainability and application of 3D4DEAF programme beyond VET education sector**

It is important to notice that the 3D4DEAF Programme, moreover, may be implemented in a variety of ways, depending on the individual organisational characteristics and contextual demands of each school/educational institution in each nation. The programme is versatile and sustainable thanks to its various applications in different contexts.

The teacher, educator and mentor applying the programme 3D4DEAF plays in this sense an important role in the implementation and continuity process.

The following figures explain the proposed implementation forms for two key groups, namely "Within VET Center/School Time" and "After VET Center/School Time /Other".

### Within VET Center/School Time application of 3D4DEAF project programme

The incorporation of the 3D4DEAF programme into the VET centre/school curriculum allows school units and educational centres and institutions to take another step towards developing both teachers' and students' digital skills, while also having an important tool at their disposal for enhancing their digital strategy. The incorporation of the 3D4DEAF Programme into the school curriculum promotes the study of 3D and social entrepreneurship as a way of achieving the learning goals and objectives related with the many disciplines that the class teacher chooses or is assigned to teach.

The 3D4DEAF Programme assists teachers in the educational process and its practical application in various manners: here you can read them listed in brief, below.

- Provides the class teacher with the required theoretical preparation.
- Provides extensive digital content on the e-platform and its mobile app.
- Recommends easily available educational materials for use in class.
- Encourages and gives support to instructors to create their own lesson plans that are targeted to the individual requirements of their learners with deaf disability.
- Encourages school and inter-VET centres collaboration

As a consequence, the 34DEAF Programme's educational resources and pedagogical help can be combined in practice in the following cases:

- Assisting in the VET classroom teaching of educational courses, particularly those including STEM disciplines and promotion of entrepreneurship;

- Cross-Curricular Approaches in Flexible Zones or Other Innovative Programmes;
- Skills Training Workshops, which are currently or will be accessible in a number of European countries;
- Teaching specialist disciplines such as advanced ICT, 3D modelling and printing.

Simultaneously, the implementation of the 3D4DEAF Programme transcends VET centres' classroom boundaries, becoming a topic of interest for the whole educational community.

A wide number of didactic projects can take place within this framework, with the goal of familiarising both school instructors and deaf students with 3D topics and social entrepreneurship; for instance:

On a weekly basis, teachers applying the programme may organise an hour workshop inside the VET centre syllabus /school curriculum/extra-curricular activity for their students to become acquainted with 3D and business creation abilities by utilising the 3D4DEAF project Programme.

Tutors and teachers can also become Mentors of 3D4DEAF project and backed up by such specialisation and expertise about project tools, products, goals and features they can organise various workshops such as internal training for other fellow teachers to get familiar with 3D and business creation abilities through the 3D4DEAF Programme.

The teachers involved in the 3D4DEAF pilot implementation might organise a school display in which their students and learners take the initiative to present the activities they were involved in to other classrooms/fellow courses.

Another way is to write an open invitation can be made to other VET centres and schools to attend the activities taking place during the actual trial implementation of the Programme in real time.

## After VET Center/School Time /Other application of 3D4DEAF project programme

The 3D4DEAF Programme may potentially find use outside of the VET centres' educational curriculum. For Instance, besides regular courses timetables, it would be possible to establish 'extra hours' for student's groups not only during the didactic year but also during the summer. In such way VET schools allows inter-school groups, other associations, self-governing bodies, cultural and other educational institutions to propose various activities, with the subjects - 3D and social entrepreneurship -serving as the ultimate goal of the educational process rather than the means.

The overall purpose is to encourage participation of vulnerable students and other people suffering disabilities or impairments in didactic courses and training as well as to raise the digital profile of VET school units/educational centres through promotion and dissemination of activities and events aligned with the topics of the project.

In this scenario, the 3D4DEAF Programme can completely support the numerous applications since its instructional tools provide a variety of options. More specifically:

- The DUAL EDUCATIONAL PACK explains in easy stages the fundamental principles of 3D techniques and Important Information on how to create/lead a business.
- The videos are accessible and usable in a variety of contexts.
- Small exercises and tasks to accomplish are advised as activities.
- Alignment to a larger shared goal is desired: learners are invited to become Social entrepreneurs



Taking into consideration such framework, the following activities can be organised:

Using the 3D4DEAF Programme, a teacher, an educator or mentor may organise workshops to introduce subjects to his/her students.

After school hours, VET centres can organise workshops and open info days to present the 3D4DEAF programme to parents' associations and local authorities with the support of teacher-mentors specialised in the project.

After VET centre/school hours, webinars can be set up with the help of teacher-mentors to familiarise fellow teachers interested in adopting the 3D4DEAF Programme with their pupils.

As shown in the preceding tables, the 3D4DEAF Program's adaptability allows it to be implemented in both formal and informal educational settings, as part of the VET centre and school curriculum (in class or cross-curricular), as an after-school extra-curricular or team-building activity, or as a teacher training event.

## 5. Materials

The project website act as the main repository of the finalised materials.

The results are available [HERE](#).

**The WP2 - The European Monitoring Report & 3D4DEAF Dual Training Pack: Introducing 3D Technologies in Teaching and Learning for a Sustainable Future** which as explained before entails numerous activities and results; all available as follows:

[A1: 3D4DEAF COMPARATIVE INDEX & PRACTICAL GUIDEBOOK](#)

*National Report(s): five Country Report [here](#)*

*Innovative Group Activity: meeting and focus groups [here](#)*

*Infographics: all the visual translated in all partners' languages [here](#)*

*Practical Guidebook: possible to download it in all partners' languages [here](#)*

*E-mentoring materials: training videos are on the project YouTube Channel accessible from [here](#)*

*Study Visits in all partners 'countries: information and pictures are to be found [here](#)*

### **A2: DUAL COMPETENCE FRAMEWORK**

*The 3D4DEAF Competence Framework, separated into three levels (1-Starters, Level 2: Movers, and Level 3: Experts): ready to be downloaded in all partners' languages [here](#)*

*The training materials, a total of 2 modules divided in 7 topics, in an easy navigating click menu to access all the translated versions [here](#)*

*The two Guidebooks targeting educators for each Module, stored in a click down menu and in all consortium national languages are [here](#)*

*The present document Methodology for implementing the 3D4DEAF programme is also available [here](#) in all the languages of the Countries participating to the project.*

**The WP3 - The Cloud-based Platform and Mobile App: e-Learning, e-Assessment, e-Community, and 3D4Deaf Entrepreneurs Network**

**The WP4 - The Augmented Reality Game for Setting Up a Social Business, Training Mobility & Final Design**



[www.3d4deafproject.eu](http://www.3d4deafproject.eu)

