ECHOES: Extended Classrooms for Higher Opportunities Enhancing Skills

R1 -A2.1 EUROPEAN STATE OF ART AND RESEARCH REPORT ON DISTANCE AND VIRTUAL LEARNING FOR VET AND WBL PROJECTS

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1. Aims of the National State of Art and Research Report

The objective of this analysis is to deliver a European-level overview of the most widely adopted distance learning platforms, identify cultural and skill gaps, and highlight best practices and exemplary cases. This analysis is based on a synthesis of individual national perspectives provided by the partners of the ECHOES project.

The findings were derived from an integration of diverse data sources, including documentary desk research, questionnaires distributed to a targeted audience, and focus groups engaging key stakeholders. Specifically, project partners contributed to the analysis through three main channels:

- National Desk Research: A thorough review of the most significant and widely utilized e-learning platforms across different countries.
- Questionnaires and Focus Groups: Tools designed to gather insights on skills, gaps, deficiencies, and best practices. These activities were conducted with a carefully selected audience, identified using parameters established by the Project Management Committee.

This collaborative approach ensured a holistic examination of the current distance learning landscape in Europe. The resulting analysis not only highlights common trends and challenges but also provides valuable insights to enhance the effectiveness and inclusivity of virtual learning environments.

2. Methodology

The European State of Art and Research Report serves as a comprehensive document synthesizing contributions from diverse sources. Its methodology unfolds through the following sequential steps:

1. **Desk Analysis**

   The initial phase, termed "Desk Analysis," was designed based on an index collaboratively developed by t2i and Ass.For.SEO. This stage leverages online reports, statistics, academic theses, research papers, and other relevant documents identified by project partners. The analysis explores aspects such as the most widely used e-learning platforms, distinctions between open-source and proprietary solutions, user profiles, requisite skills, and existing gaps. Despite the challenge of consolidating consistent data across Europe, the aim is to present a well-rounded overview spanning the pre- and post-COVID-19 periods, acknowledging the pandemic's transformative impact on e-learning and its tools.

2. **Questionnaire Results**

   The second step involves administering a structured questionnaire targeting professional training operators, including trainers, mentors, and coaches. Each of the 5 partners is responsible for selecting respondents according to defined criteria to ensure meaningful insights. These criteria include a minimum of one year’s experience in vocational education and training (VET) and/or work-based learning (WBL), at least one year of involvement in distance learning, and preferably experience in practical distance learning during the pandemic. To ensure clarity and effectiveness, the questionnaire was preceded by a pilot phase, tested on a small sample of 4–5 trainers selected by partners, with their feedback incorporated into the final version.

3. **Focus Group Reports**

   The third phase entails organizing focus groups to deepen the insights gathered from the questionnaires. Discussion topics derive from the analysis of questionnaire responses, enabling a richer exploration of key themes.

4. **Collection of Good Practices**

   In the final phase, project partners compile a collection of good practices. Using a standardized template, they document notable VET and WBL experiences in distance learning from their respective countries. The aim is to highlight successful projects or practices with the potential for replication in other contexts.

To ensure uniformity, a glossary of key terms has been provided:

- **E-learning**: A suite of technological tools for delivering multimedia educational content.
- **Distance learning**: Training delivery via audiovisual and information technologies.
- **WBL (Work-Based Learning)**: Training focused on learning through practical, job-based experiences to bridge education and employment.
- **VET (Vocational Education and Training)**: Education pathways that prepare individuals for specific professions and facilitate entry into the labor market.

The European Commission actively supports education and vocational training, allocating significant funding for 2021–2027 to advance sustainability, expand digital learning platforms, and modernize professional training at all levels.

Vocational Education and Training (VET) plays a pivotal role in enhancing the quality of vocational pathways essential for the EU's development and its social and employment policies. VET prioritizes aligning education with learners' talents and aspirations, equipping them with versatile skills, and offering national and organizational recognition.

Career opportunities and challenges in VET will remain critical over the next decade. Mentoring, as a pedagogical approach, fosters personal and professional growth through a relationship between an experienced mentor and a less experienced mentee. Similarly, tutors act as guides or supports, playing a vital role in educational frameworks.

An e-learning platform, often synonymous with a Learning Management System (LMS), integrates interactive services for online learning and training. These platforms deliver a comprehensive experience, enabling enrollment, course participation, performance evaluation, and certification.

3. State of the art and development of online/distance learning in Europe

The widespread and "unprecedented" adoption of eLearning during the pandemic prompted the European Commission to initiate an open consultation to the public. The aim was to gather experiences and best practices to enhance the effectiveness, inclusivity, and engagement of distance, online, and blended education. The suggestions gathered between June and September 2020 served as the foundation for the new Action Plan for Digital Education (2021-2027). To address the needs identified, two key priorities were established in the plan. This information will help in providing a more accurate and context-specific response.

3.1 Data on digitization in Europe

Eurostat 2019 data highlights infrastructure and connectivity gaps in different areas in Europe. In particular, where the purchasing power of households is lowest, the main obstacle to distance education is the lack of broadband connectivity and computers. Italy, for example, is in third last place, ahead of Romania and Bulgaria, with 19% of people between 16 and 24 living in households without digital skills, against 8% of the European Union average (EU) to 27. As for teachers, the public consultation showed that 60% of them learned to use digital education tools during the pandemic, without adequate preparation and, more significantly, 50% believes that he must continue to learn.

Source- https://www.dyndevice.com/it/news/istruzione-digitale-2021-2027-cambia-l-elearning-in-eu-ELN-1176/

3.2 Priority 1: Promote the development of a highly effective digital education ecosystem

The starting point for ensuring the success of distance education in Europe is to step up joint efforts to respond to the demands of:

Infrastructure, connectivity and digital equipment: an awareness-raising action will be carried out to intensify the use of European funding such as Connectivity4Schools or other funds useful for purchasing equipment, applications and eLearning platforms.

Coordination for e-skills development policies: by the end of 2021, the Council will make recommendations for distance education in primary and secondary education and a policy dialogue will be launched between member states by 2022.

Teacher education: Digital transformation plans will be supported through Erasmus teacher academies and the online tool for teacher self-assessment, SELFIE.

Quality learning content and secure eLearning platforms: The creation of a European exchange platform for sharing online resources in connection with existing eLearning platforms will be encouraged.

3.3 Priority 2: Develop digital skills and competencies needed for digital transformation

The second priority concerns the strengthening of students' digital skills, starting from kindergarten, through:

- Digital literacy and fight against disinformation: digital literacy will be monitored with a focus on students aged 13-14 and collaboration between teachers, civil society and the media will be promoted to fight disinformation.
- IT courses: a European Certificate of Digital Competence (EDSC) will be created; an improvement of the digital training offer will be recommended to improve didactic education and respond to skills demands from companies.
- Information on data-intensive technologies such as artificial intelligence: AI will be included in the European digital competence framework and the creation of educational resources on the subject by education, training and other training providers will be promoted.
- Promotion of advanced digital skills, especially among young people and women: offer of targeted internships for the acquisition of digital skills for students, teachers, trainers; policies for increased participation of women in STEAM (science, technology, engineering, arts and mathematics) studies.

The consultations launched by the European Commission have highlighted that the affirmation of distance learning, dictated by the frenetic times of the pandemic, has highlighted even more the weaknesses at European level in terms of basic and advanced digital skills, infrastructures and connectivity (from broadband to LMSs). The two priorities of the Strategic Plan (2021-2027) respond precisely to the need to create a favorable environment for quality distance education, overcoming infrastructural obstacles, the lack of digital skills on the part of teachers and students and passing through the promotion of young people and women, as well as strengthening coordination between Member States.

3.4 Online/Distance Training in Vocational Training (VET) and Work Based Learning (WBL) Projects – Dissemination at European level: What is the Digital Education Action Plan?

The Digital Education Action Plan (2021-2027) is a renewed policy initiative by the European Union (EU) aimed at supporting the sustainable and effective adaptation of EU Member States' education and training systems to the digital age.

The Digital Education Action Plan:

- Offers a long-term strategic vision for a high-quality, inclusive, and accessible European digital education.
- Addresses the challenges and opportunities brought to light by the COVID-19 pandemic, which has led to an unprecedented use of technology for education and training.
- Aims to strengthen EU-level cooperation on digital education, emphasizing the importance of collaborative efforts across sectors to integrate education into the digital age.
- Presents opportunities, including enhancing the quality and quantity of teaching related to digital technologies, supporting the digitization of teaching methods and pedagogies, and providing the necessary infrastructure for inclusive and resilient distance learning.

To achieve these goals, the Action Plan advocates for promoting the development of a highly effective digital education ecosystem. This sector encompasses the following aspects:

- Infrastructure, connectivity, and digital equipment.
- Effective planning and development of digital capabilities, including up-to-date organizational capabilities.
- Teachers and staff involved in education and training who are familiar with digital technologies and are competent in the subject.
- High-quality learning content, easy-to-use tools, and secure platforms that comply with e-privacy rules and ethical standards.
- Improving digital skills and abilities for digital transformation.

This necessitates:

- Basic digital skills and competences from childhood.
- Digital literacy, including efforts to combat disinformation.
- Computer science education.
- Good knowledge and understanding of data-intensive technologies, such as artificial intelligence (AI).
- Advanced digital skills to increase the number of digital specialists.
- Ensuring equal representation of girls and young women in digital studies and careers.

Why is it necessary to act? The digital transformation has profoundly impacted society and the economy, with increasingly far-reaching effects on daily life. However, until the COVID-19 pandemic, its influence on education and training remained relatively limited.

The pandemic has underscored the imperative of having an education and training system well-suited for the digital age. It has brought to light the need for elevated levels of digital literacy in education and training, while also accentuating various existing challenges and inequalities. These disparities are evident between those with access to digital technologies and those without, particularly among individuals from disadvantaged backgrounds.

The pandemic has also highlighted several challenges for education and training systems, including issues related to the digital capabilities of educational institutions, teacher training, and general levels of digital skills and competences.

The statistics speak volumes: a 2018 study by the Organization for Economic Co-operation and Development (OECD) revealed that less than 40% of educators feel adequately prepared to use digital technologies in teaching, showcasing significant variations across the EU. Additionally, more than a third of 13- and 14-year-olds participating in the International Computer and Information Literacy Study (ICILS) in 2018 lacked even the most basic level of proficiency in digital skills. Furthermore, a quarter of low-income households lack computers and access to broadband, with substantial differences across the EU based on household income (Eurostat, 2019).

The pandemic has accelerated the ongoing trend towards online and hybrid learning. This transformation has enabled teachers and students to explore new and innovative methods for online teaching and studying, offering increased possibilities for personal and flexible interaction.

These changes necessitate a robust and coordinated effort at the EU level to assist education and training systems in addressing the challenges identified and exacerbated by the COVID-19 pandemic. Simultaneously, it calls for proposing a long-term vision for the future of digital education in Europe.

3.5 Political context

The need for a new Action Plan, to be developed building on the first Digital Education Action Plan (2018-2020), was expressed in the political guidelines of European Commission President Ursula von der Leyen in July 2019.

The revamped Digital Education Action Plan contributes to the Commission's priority 'A Europe fit for the digital age' and the NextGenerationEU initiative. It also supports the Recovery and Resilience Facility, which aims to create a greener, more digital and more resilient European Union.

The Digital Education Action Plan is a key enabler to achieve a European Education Area by 2025. It contributes to the achievement of the objectives of the Skills Agenda for Europe, the Action Plan for the Social Committee and the initiative "Digital Compass for 2030: Europe's model for the digital decade".

Open public consultation

From July to September 2020, the Commission carried out an open public consultation to gather the views and experiences of citizens, institutions and organizations from the public and private sector on the impact of the COVID-19 pandemic on education and training, its transition to distance and online learning and their vision for the future of digital education in Europe.

The public consultation revealed that:

- nearly 60% of respondents had not used distance and online learning before the crisis
- 95% believe the pandemic crisis represents a tipping point for the way technology is used in education and training
- respondents said that online learning resources and content need to be more relevant, interactive and user-friendly and not dependent on the financial resources of a city or municipality
- over 60% believe they have improved their digital skills during the crisis and over 50% want to improve them further.

With over 2,700 responses from 60 countries and 127 position papers submitted, the consultation helped shape the Commission's proposal for a new digital education action plan, which was adopted by the College of Commissioners on 30 September 2020.

Digital Education Action Plan actions

The Digital Education Action Plan proposes the following actions for the period 2021-2027:

Priority 1: Promote the development of a highly effective digital education ecosystem

Action 1: Policy dialogue with Member States on factors that favor the success of digital education

Action 2: Council recommendation on blended learning for primary and secondary education

Action 3: European Digital Education Content Framework

Action 4: Connectivity and digital equipment for education

Action 5: Digital transformation plans for education and training institutions

Action 6: Artificial intelligence and data use in education and training

Priority 2: Improving digital skills and abilities for digital transformation

Action 7: Common guidelines for teachers and educators to promote digital literacy and tackle disinformation through education and training

Action 8: Update the European Digital Competence Framework to include AI and data skills

Action 9: European Certificate of Digital Skills (EDSC)

Action 10: Council Recommendation on improving the supply of digital skills in education and training

Action 11: Transnational collection of data on students' digital competences and introduction of an EU target for students' digital competence

Action 12: Traineeships "Digital Opportunities"

Action 13: Participation of women in STEM disciplines

Digital Education Hub

To support both priority areas, the Commission will establish a Digital Education Hub that will enhance cooperation and exchanges on digital education at EU level.

First action plan for digital education

The Digital Education Action Plan 2021-2027 builds on the first plan for 2018-2020, which pursued the following priority objectives:

• improve the use of digital technology for teaching and learning

• develop digital skills and abilities

• improve education through better data analysis and forecasting.

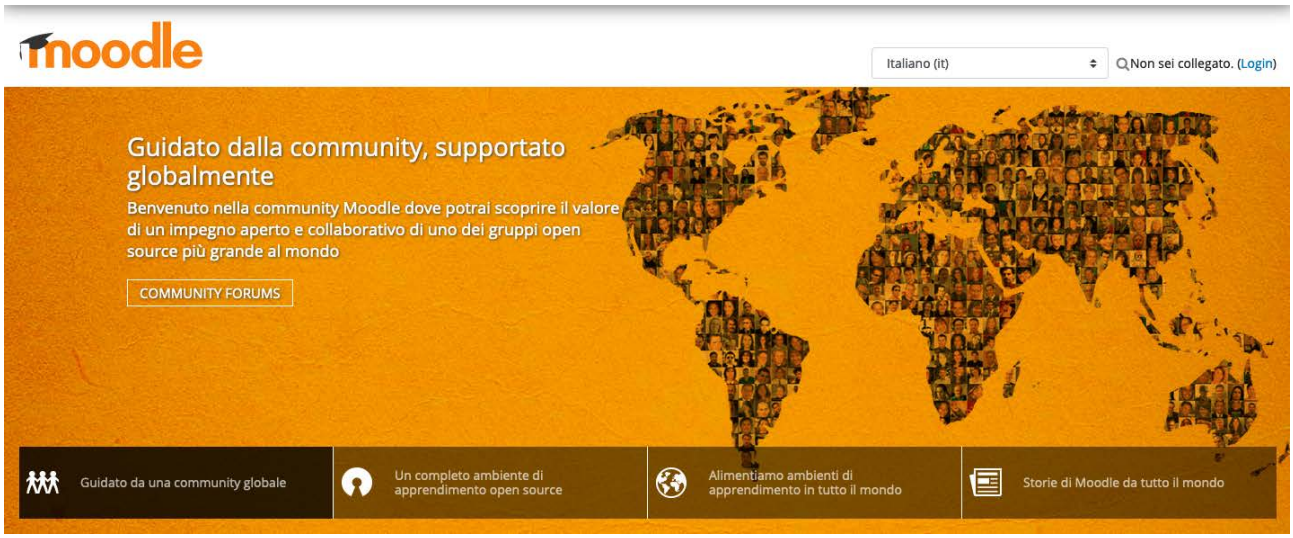
Source: https://education.ec.europa.eu/it/focus-topics/digital-education/action-plan

3.6 The most used platforms

Through the comparison of national reports and an integration with a further bibliographic search, we obtained a list of the top 8 most used platforms at European level. Below is a description of the main features; for any further information, we invite you to investigate through the individual national researches: Austria, Italy, Slovenia and Spain.

3.6.1 Moodle

Moodle is an accredited reality in e-learning. It is a community-driven open source platform that has become the largest in the world. In total there are 90 million Moodle users and there are many institutions that recognize its validity. It serves companies for employee training, but also teachers who want to create virtual learning environments. The interface is simple and the available resources are well documented. To use it, just download free software that can be customized according to specific needs, whether for commercial or non-commercial projects. Moodle is translated into over 120 languages and discussion forums also offer support to users in every country.



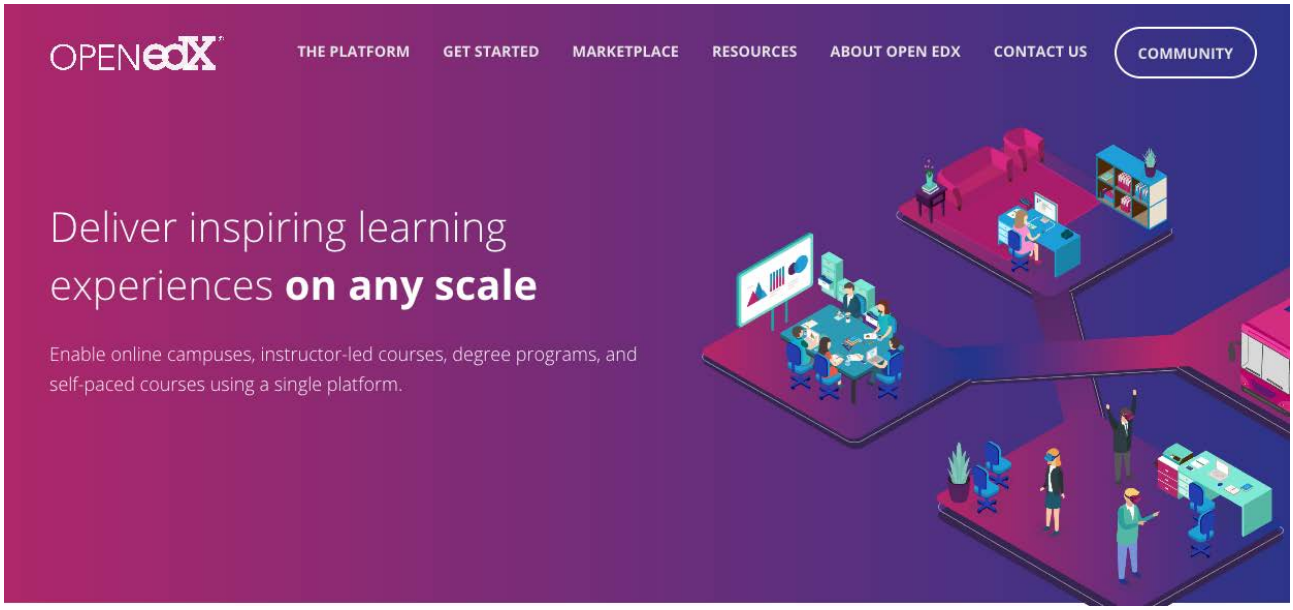
3.6.2 . Docebo

Docebo, a platform primarily tailored for corporate training, leverages AI-powered technology to enhance the learning experience. One of its standout features is a virtual coach that engages with users by answering questions, providing tailored recommendations, and guiding them through their learning journey. Available in 40 languages, Docebo offers flexible pricing options to accommodate diverse user requirements. Its extensive catalog includes over 700 online courses, designed to address a wide range of business needs, catering to organizations of all sizes—from small enterprises to global multinationals.

3.6.3 Open EdX

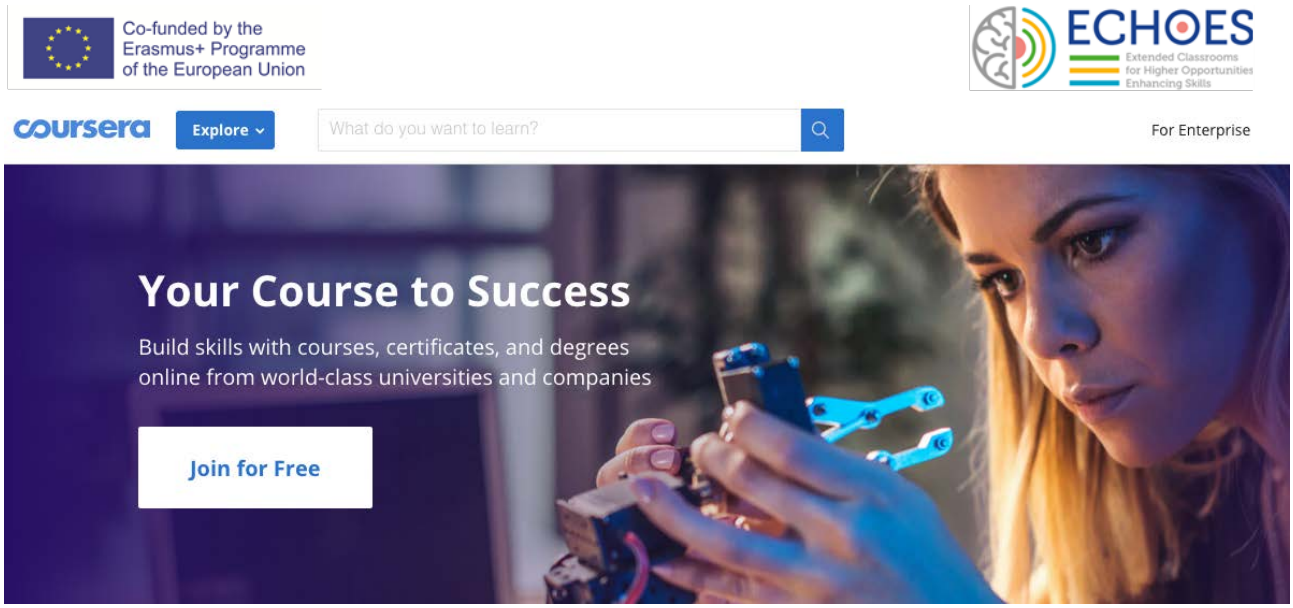
Open EdX, a non-profit initiative launched by the Massachusetts Institute of Technology (MIT) and Harvard University, serves as a powerful tool for leading universities and institutions to explore the potential of e-learning. The platform provides a vast array of courses across disciplines such as biology, business, chemistry, information technology, economics, finance, electronics, engineering, history, literature, mathematics, and more. It incorporates diverse learning resources, including video lectures, quizzes, assessment tests, and online labs, making quality education accessible to those who may not have the means to attend prestigious

universities. Open EdX offers learners a glimpse into the rigor and excellence of high-level American education, while still preserving the unique experience of studying on an Ivy League campus. To date, Open EdX has reached over 40 million learners worldwide, offering more than 20,000 courses in 32 languages.



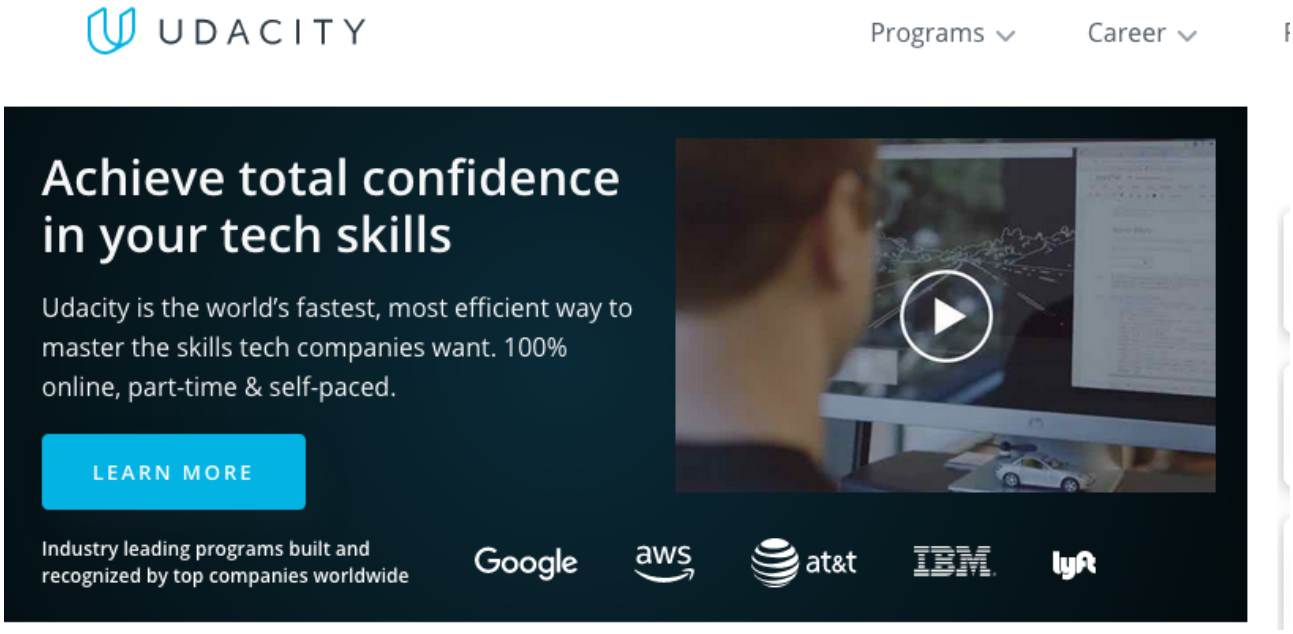
3.6.4 Coursera

Coursera, another platform with academic origins, was founded by professors from Stanford University. It specializes in Massive Open Online Courses (MOOCs), offering free access to course materials while providing the option to pay for progress evaluations and skill certifications. The platform covers a wide range of subjects, from the humanities to the sciences, with courses taught by professors from top universities around the world. Coursera has successfully reached an audience of over 45 million learners, making it a global leader in accessible, high-quality education.



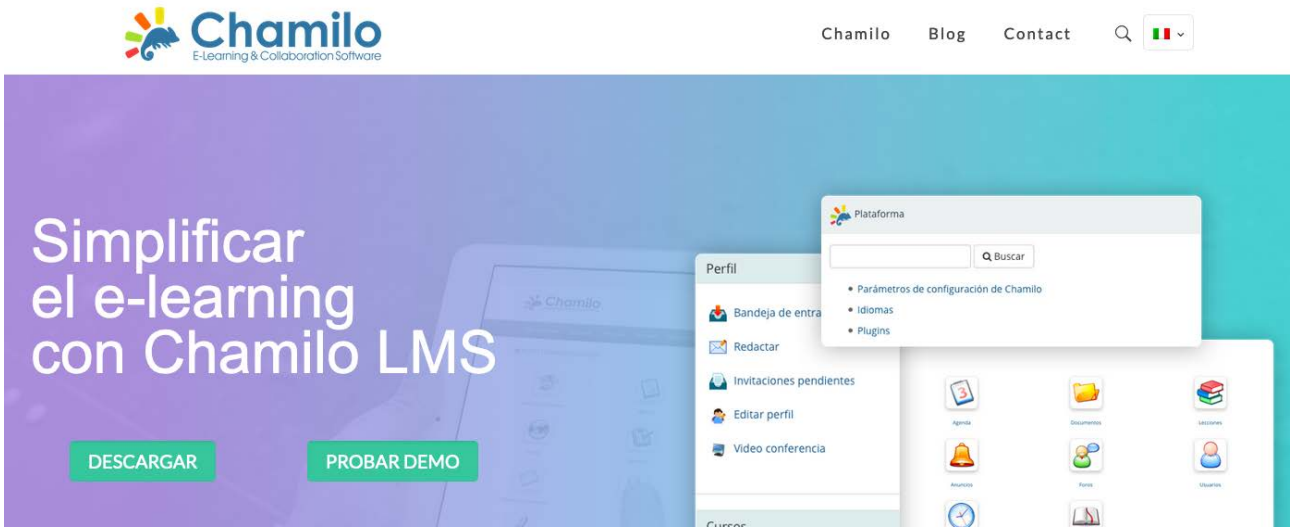
3.6.5 Udacity

Udacity, an educational organization founded in 2011, offers online courses accessible to everyone. Subscribers can benefit from video lessons, assessment tests, and final certificates. Renowned for its speed and efficiency, Udacity is particularly well-suited for training aligned with the demands of technology companies. Its programs are specifically designed to meet business needs, equipping learners with the skills required to work at leading companies such as Google, IBM, and AT&T.



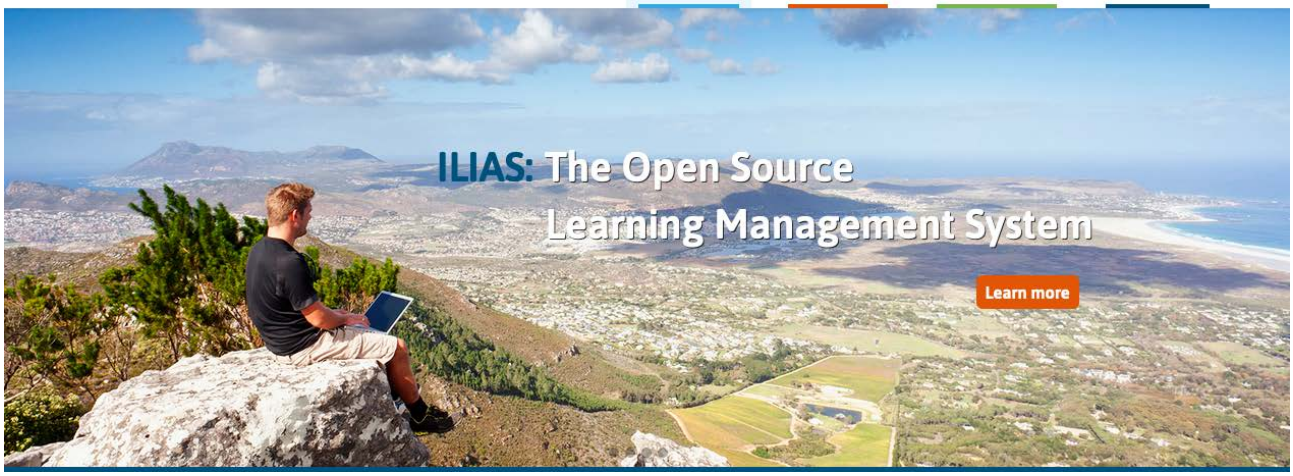
3.6.6 Chamilo

Chamilo is another free software platform designed to enhance access to education, particularly in regions where attending school is challenging. By offering high-quality education at minimal costs, the project remains accessible to a wide audience. Optimized for mobile devices, Chamilo extends the boundaries of learning, enabling users to access educational content anytime and anywhere.



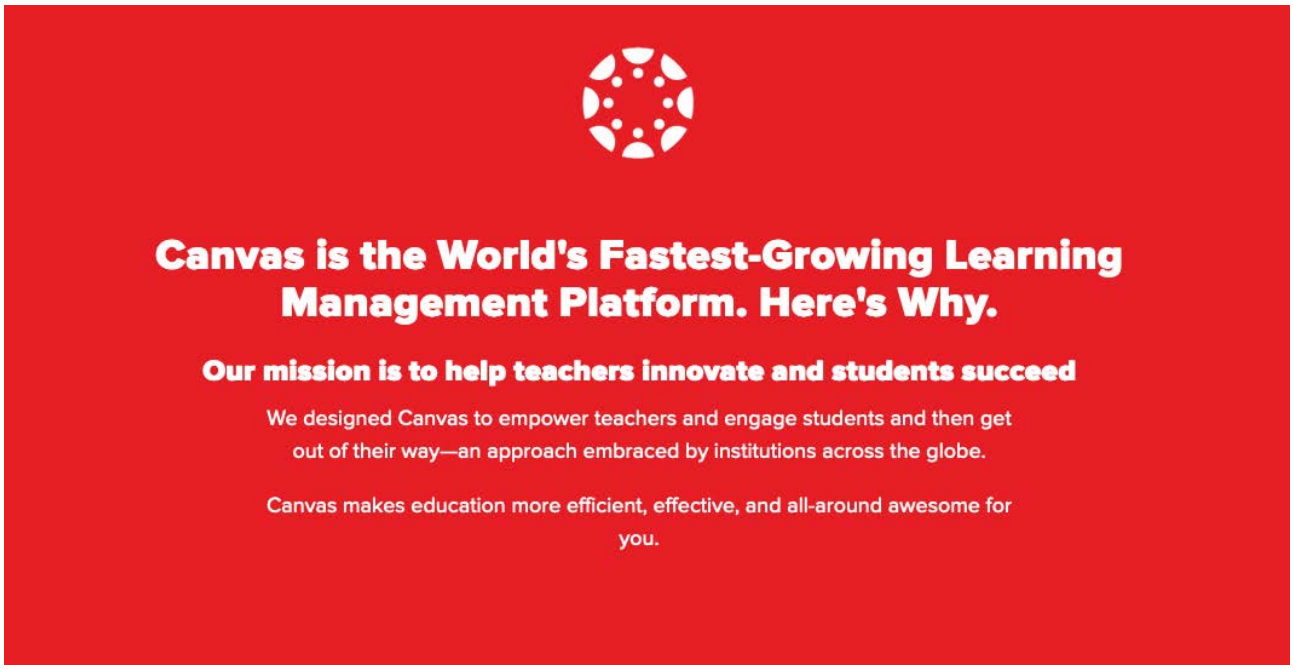
3.6.7 ILIAS

The first ILIAS prototype was developed in 1997 by the University of Cologne, envisioning a dedicated learning management system for its students. As interest from other universities grew, ILIAS transitioned into open-source software in 2000, making it freely available to a wide range of institutions, including higher education organizations and public authorities. Its success lies in its free accessibility and the collaborative contributions of a growing global community. This community-driven approach allows ILIAS to evolve continuously, meeting the demands of a rapidly changing learning landscape that seeks increasingly advanced solutions.



3.6.8 Canvas

Canvas is a rapidly growing platform in the field of learning management. It focuses on two main areas: innovating teaching methods and supporting students throughout their educational journey. Each institution can create a personalized learning environment tailored to its needs. Today, Canvas has become the most widely adopted LMS in North America, with millions of users across more than 70 countries.



3.7 Comparison between platforms

On the Capterra.it website, we can find evaluations of the platforms, with positive and negative aspects rated on a scale from 0 to 5. These ratings are provided by users.

Platform	Positves	Negatives
Moodle	Ease of use - 4.1 Customer care - 4.0 Characteristics - 4.2 Value for money - 4.4	Difficult to navigate
Docebo	Ease of use - 4.2 Customer care - 3.9 Characteristics - 4.1 Value for money- 3.9	Price model is not so flexible and does not fit with small and medium businesses. No price tiers under 300 user / months, could be expensive at early stages.
Open edx	Ease of use - 4.6 Customer Service -4.7 Features - 4.7 Value for money - 4.7	The user interface is not easy for all to navigate
Cursera	Ease of use - 4.5 Customer care - 4.2 Characteristics - 4.5 Value for money - 4.4	The price
Udacity	Ease of use - 4.5 Customer care - 4.4 Characteristics - 4.4 Value for money - 4.4	A lot of material
Chamilo	Ease of use - 4.5 Customer care - 4.2 Characteristics 4.5 Value for money 4.8	Template hard to customize
Canvas	Ease of use - 4.4 Customer care 4.3 Characteristics 4.4 Value for money 4.5	The user interface is not easy to navigate Lot of problems with the app

4. Survey administered to VET professionals

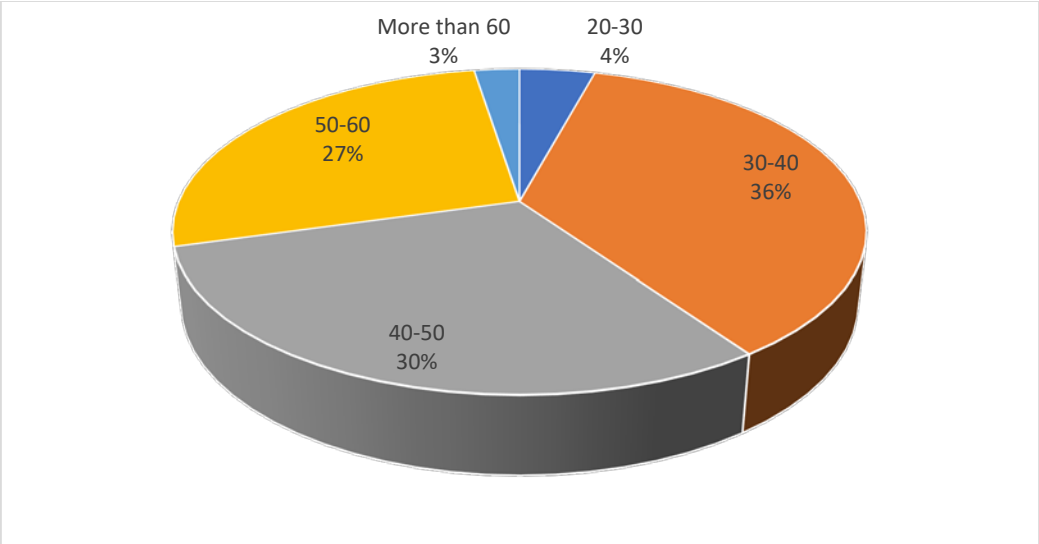
The Echoes project partnership administered an online questionnaire to a sample of 120 professional training operators (trainers, mentors, coaches), selected based on criteria agreed upon by the partnership, as outlined below:

- Previous experience in professional training (VET and/or WBL), ideally for over one year.
- Experience in distance learning, preferably for over one year.
- Ideally, experience in practical types of distance learning (e.g., exercises, workshops, mentoring, shared exercises, etc.), or experience dealing with these aspects during the pandemic.

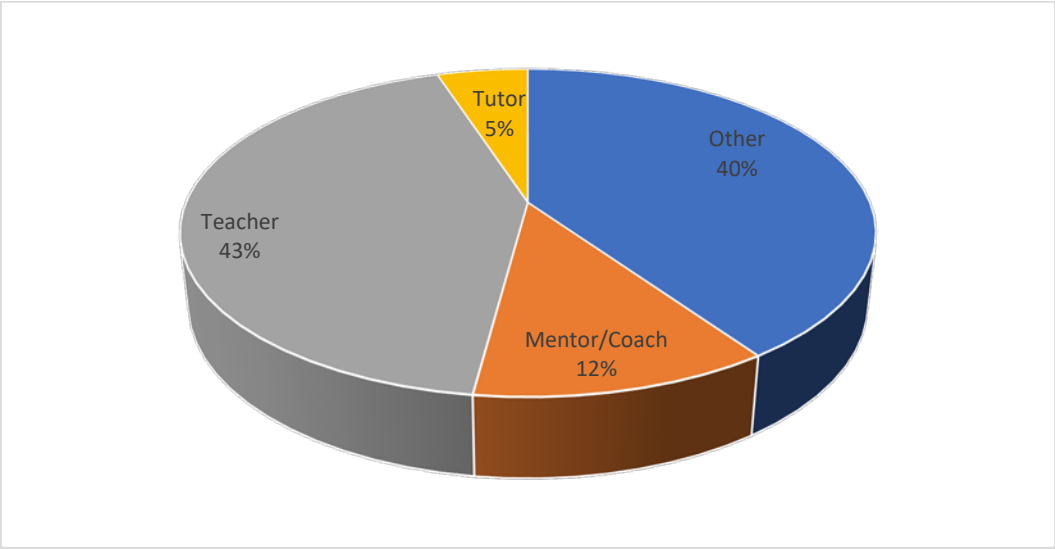
4.1 Characteristics of the Questionnaire Respondents

Section I of the questionnaire aimed to define the profile and key characteristics of the respondents. The results from the answers received are analyzed below, highlighting the main characteristics that emerged.

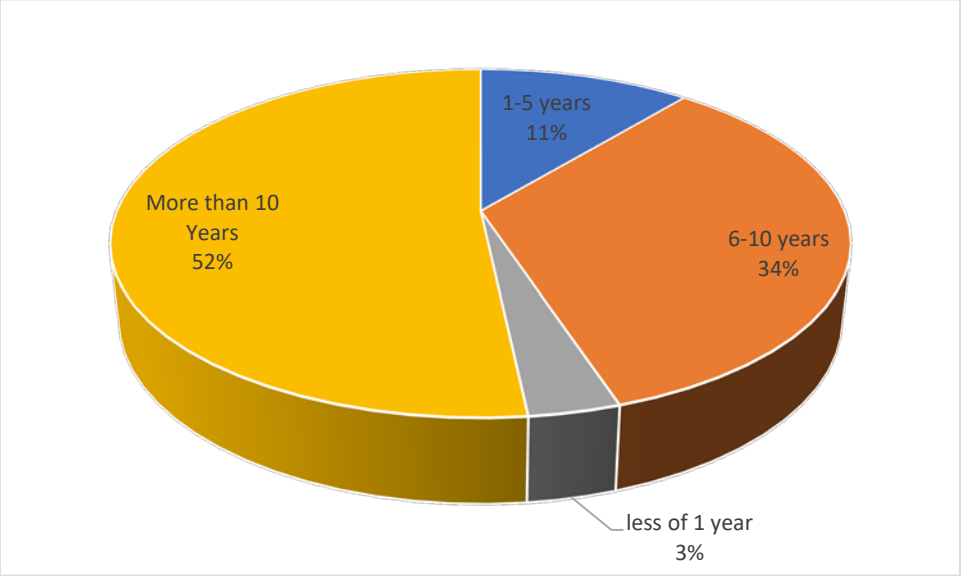
Age Range:



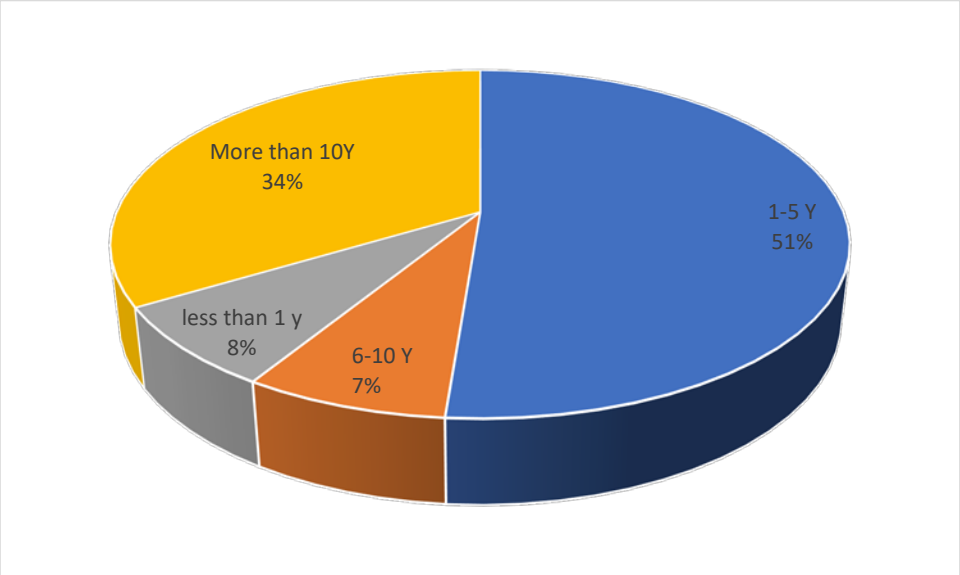
Role within the organisation:



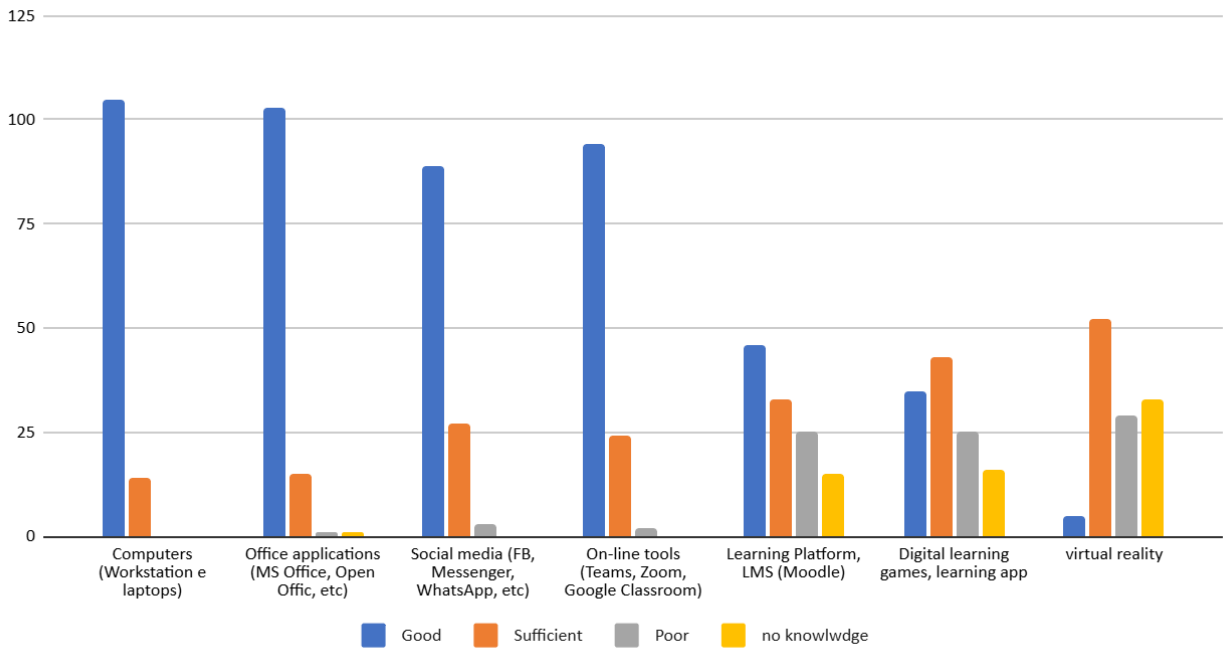
Experience on teaching/training in VET:



Experience in distance teaching and learning:



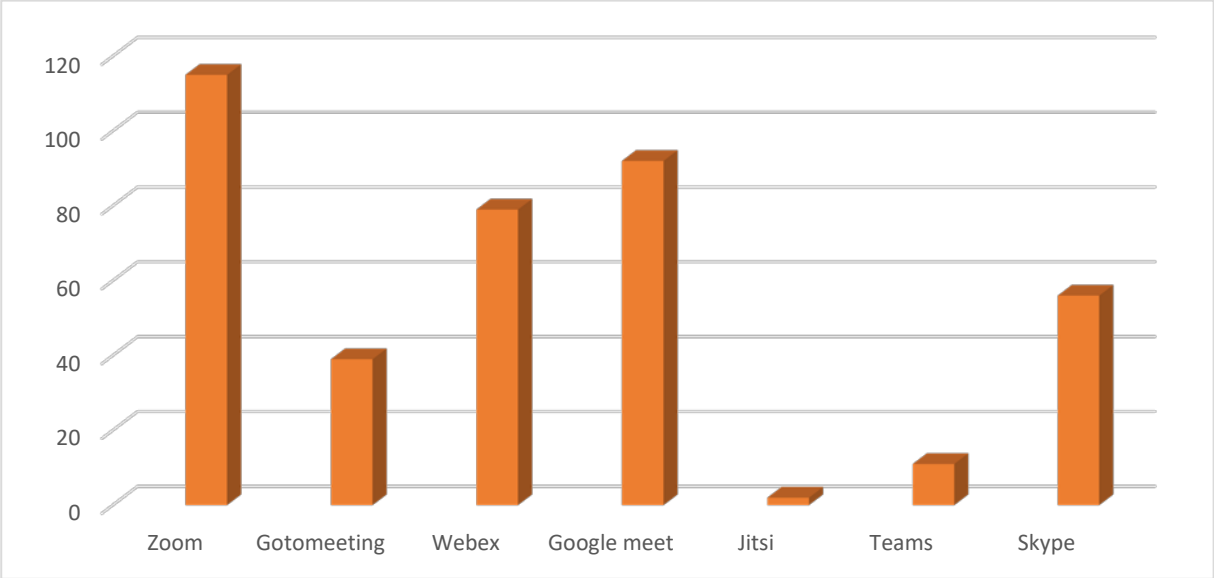
Regarding **knowledge and skills in technologies and tools**, all respondents reported having a good or very good understanding of general ICT tools, software, social media, and videoconferencing systems. However, greater challenges were reported in accessing knowledge related to the overall functionality of learning platforms, digital learning games or apps, and virtual reality technologies.



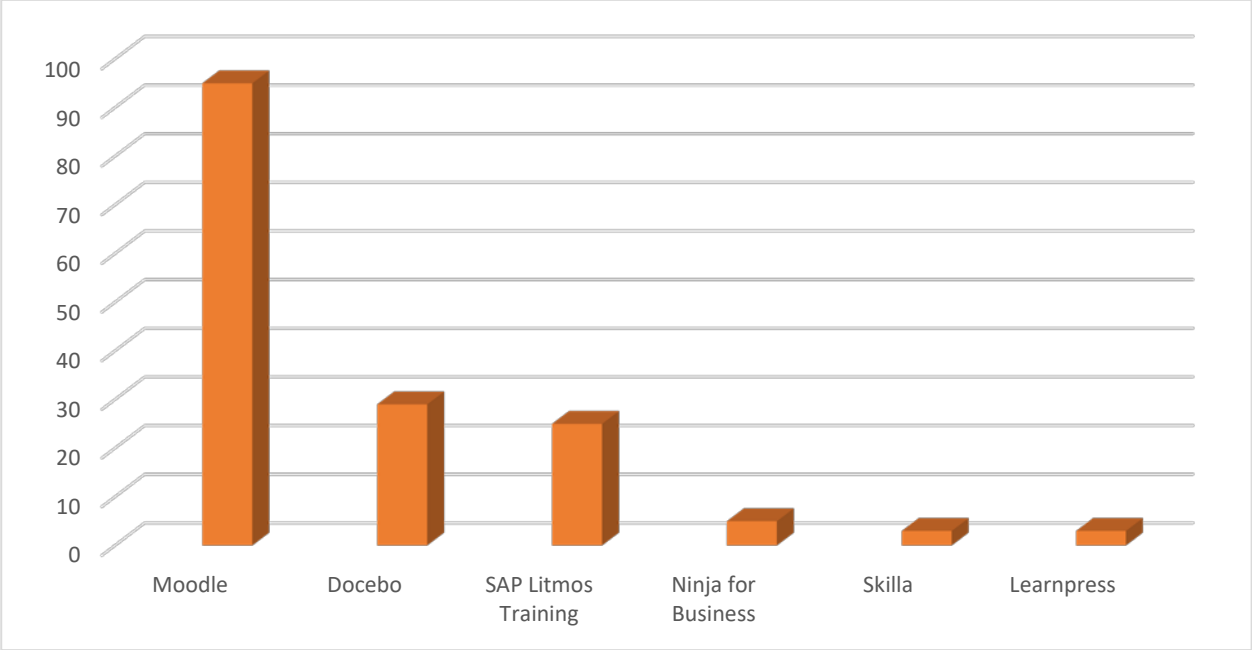
When asked about their own **attitudes as teachers or VET professionals**, they indicated the following characteristics as predominant:

- I encourage my students to work together/help each other to achieve a work task
- I am able to inspire my students on specific topics
- I support my students in exploring and applying innovative approaches for solving problems and to achieve work tasks
- I support my students in implementing their ideas
- I am able to motivate my students
- I use methods that promote the problem-solving
- I support and enable my students to define priorities.

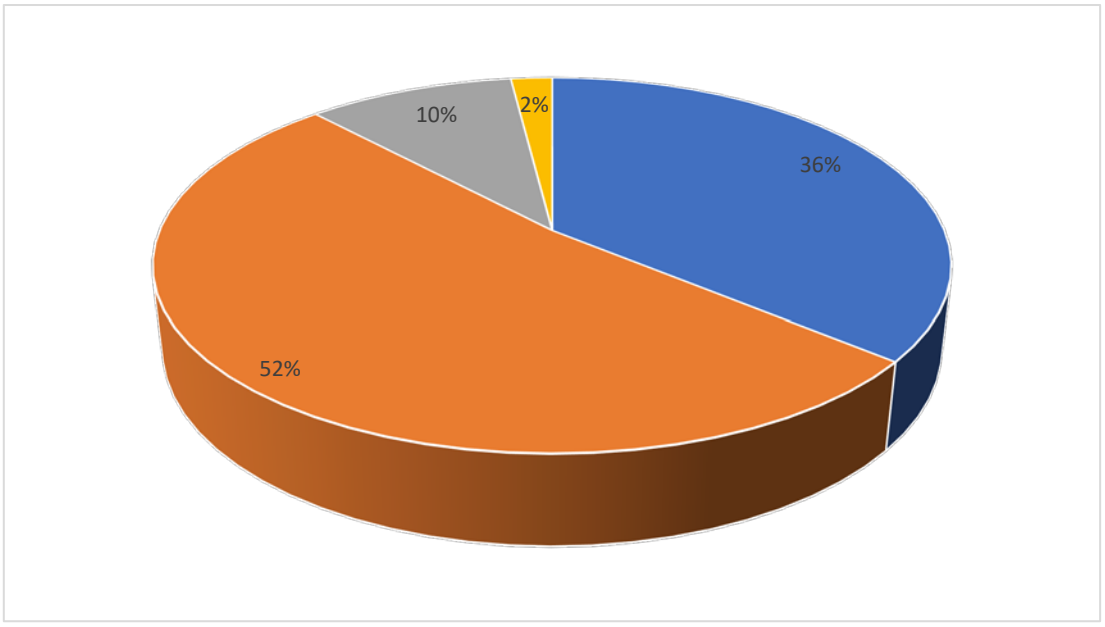
The selected sample was then questioned about the main tools (video-conferencing systems and software) that they know and use in distance training.



In all the regions involved, the most widely used videoconferencing platforms are commonly employed, often replacing more specialized tools that could be more effective for e-learning. As a result, we have observed a strong familiarity with mainstream platforms such as Zoom, GoToMeeting, Teams, WebEx, Google Meet, and, to a lesser extent, Jitsi. Open-source, non-proprietary platforms that are not specifically designed for e-learning are the preferred choice for the majority of questionnaire respondents. Among these, Moodle is cited as the most well-known e-learning platform.

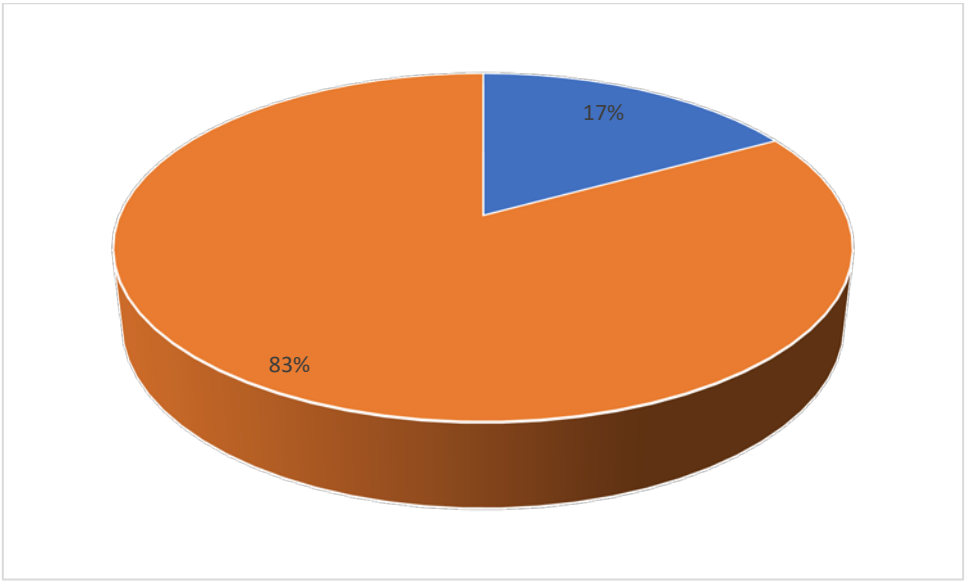


A specific section of the questionnaire was designed to gather self-assessments from professionals regarding the competencies and **skills required to deliver online or distance learning courses**. Approximately 95% of the respondents reported possessing these abilities, with the majority indicating that they require more "specific" competencies—related to certain platform functionalities—rather than "hard" skills, such as how to access or navigate the platform itself. Notably, over 50% of the respondents stated that the "blended" modality (a combination of online and in-person learning) is the most effective and impactful method for delivering training.



The reasons behind the choice are mostly the following:

- Possibility of carrying out practical activities or laboratories (over 83%),
- Interaction between teacher and student (over 17%).



4.2 Use of the Platforms for Distance Learning

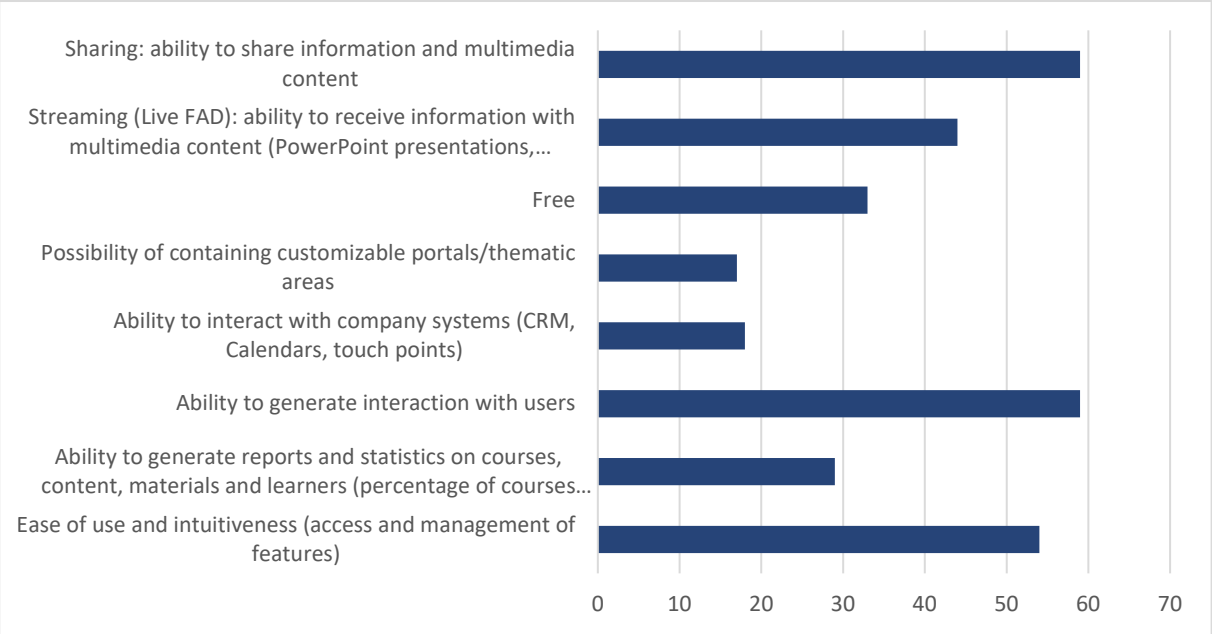
Section II of the Questionnaire aimed at investigating the following topics:

1. Main and desired characteristics that a good platform for distance learning may have,

2. Main and desired functionalities that a good platform for distance learning may offer,
3. Main resources and tools offered by the platforms for distance learning and considered as most relevant having regard to the users of VET and WBL.

As for the **Topic 1.**, the questionnaire investigated the following items:

- Ease of use and intuitiveness (access and management of features)
- Ability to generate reports and statistics on courses, contents, materials, and learners (percentage of courses completed, tests passed, material downloaded, etc.)
- Ability to generate interaction with users
- Ability to interact with company systems (CRM, Calendars, touch points)
- Ability to contain customizable portals / thematic areas
- Free services/open source
- Streaming (Live FAD): possibility to receive information with multimedia contents (PowerPoint presentations, enriched with Flash animations and transitions, 3D objects and video streaming, etc.)
- Sharing: possibility of sharing information and multimedia contents
- Other



RESULTS:

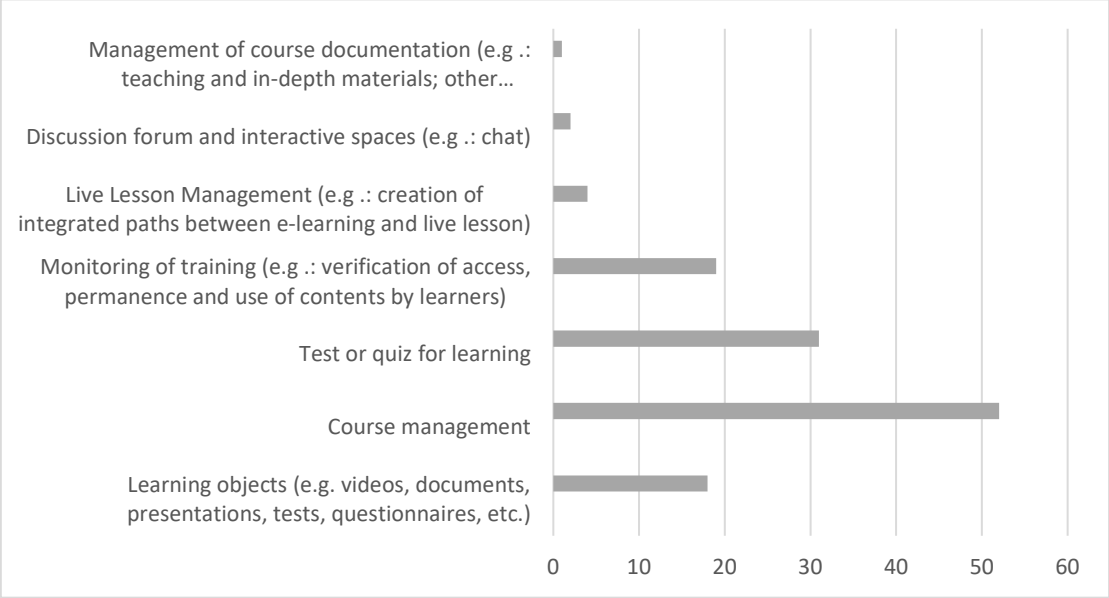
The **main and desired characteristics** that a good platform for distance learning may have:

- I*nteraction with users*
- *Sharing* of information and multimedia content
- *Ease of use* and intuitiveness (access and management of features)
- *Generation of reports and statistics* on courses, content, materials and learners (percentage of courses completed, tests passed, material downloaded, etc.)
- *Interaction with company's systems* (CRM, Calendars, touch points)
- *Customizable portals/thematic areas*
- *Streaming* (Live FAD) *options*: ability to receive information with multimedia content (PowerPoint presentations, enriched with Flash animations and transitions, 3D objects and video streaming, etc.)

Topic 2 was aimed to investigate the following items:

- Learning objects (e.g. videos, documents, presentations, tests, questionnaires, etc.)
- Course management (e.g .: presentation mode with slides or documents)
- Test or quiz for learning
- Monitoring of training (e.g .: verification of access, permanence and use of contents by learners)
- Live Lesson Management (e.g .: creation of integrated paths between e-learning and live lesson)
- Discussion forum and interactive spaces (e.g .: chat)
- Management of course documentation (e.g .: teaching and in-depth materials; other documentation, including administrative)
- Other

The question posed was aimed at complementing the previous question, by adding the area of the "wishing" to the characteristics of a good platform.

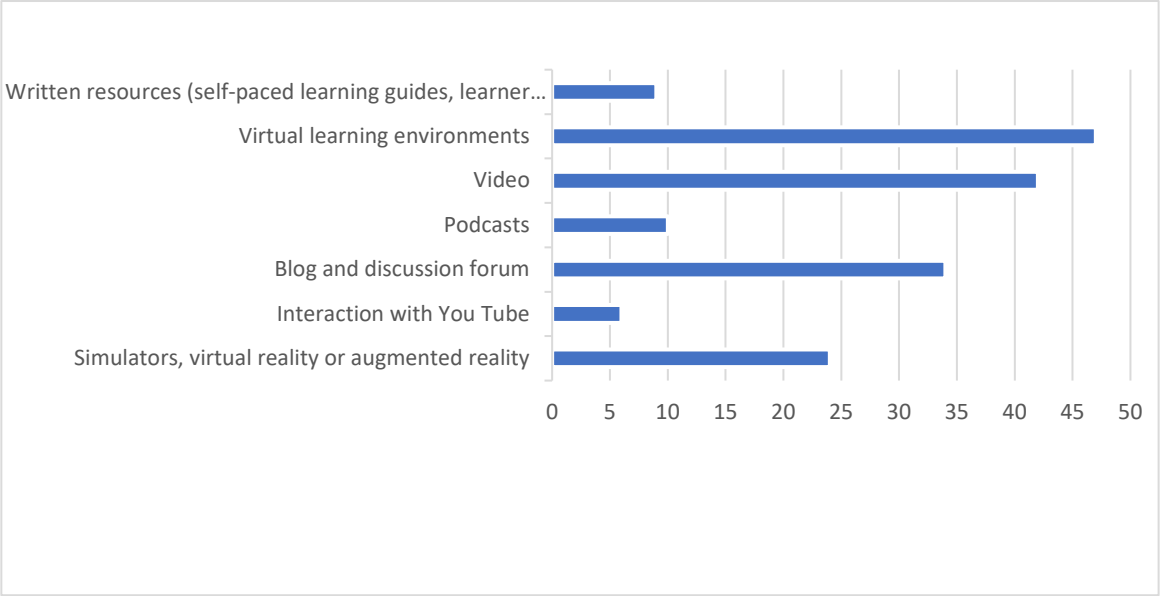


RESULTS:

The most frequent responses focus on *course management*, particularly regarding the interaction with presentation tools such as slides, videos, and other media. The second major need relates to the *ability to incorporate evaluation tests and assessments*. Additionally, two emerging needs were identified: the ability to monitor various aspects of the audience, such as attention levels and results, and the importance of *efficiently managing Learning Objects* (e.g., videos, documents, presentations, tests, questionnaires, etc.).

Topic 3 aimed to explore the tools and resources that respondents consider most important for developing and incorporating into an online/distance learning platform designed for users of vocational and work-based training. The following items were considered:

- Simulators, virtual reality, or augmented reality,
- Virtual learning environments,
- Blog and discussion forum,
- Podcasts,
- Video,
- Interaction with YouTube,
- Written resources (self-paced learning guides, learner notes),
- I do not know,
- Other.

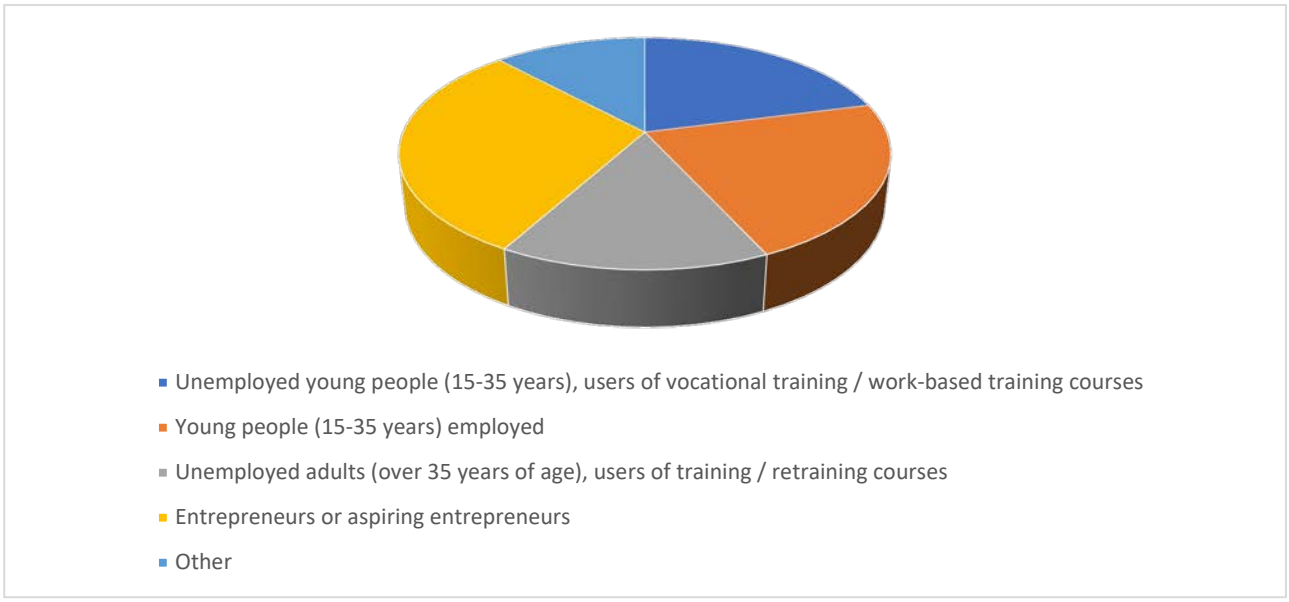


The most significant needs identified are related to the *requirement for "Virtual Learning Environments."* Additionally, the inclusion of *discussion videos, blogs, and augmented reality simulators* is seen as highly necessary. In contrast, there was less interest in written resources, podcasts, and interaction with YouTube. These findings align well with responses to the question about aspects of live learning that professionals would like to incorporate into distance learning. Specifically, they highlighted the desire to carry out practical activities or labs, as well as fostering interaction between instructors and students.

4.3 Target Groups and kind of activities

Section III of the Questionnaire aimed at investigating the following topics:

- Reference *targets* for the distance learning and their characteristics,
- Kind of *activities* and main contents for which the distance learning is more often used or preferred,
- *Difficulties and frustrations* detected when distance learning is used, having regard to different target groups.



The distribution of the various types of participants involved in the training experiences is well-balanced, an important finding that highlights the value of data aggregation in capturing the needs of a diverse sample. Regarding Topic 2, over 80% of respondents use distance learning for both theoretical and practical education. However, distance learning for coaching/mentorship is only employed by a small number of respondents, typically those engaged in specialized activities within specific subject areas.

Moving on to **Topic 3**, the responses are similarly well-distributed across the three types of challenges encountered when using platforms with different target groups:

- **Methodological issues** occur when users are young, whether employed or unemployed.
- **Technological/technical issues** are related to access and platform use.
- **Operational issues** are related to managing specific platform features, particularly when users are adults.

A specific question was posed regarding practical training (laboratories). The question was: “If you use or have used distance learning for practical training (laboratories, exercises, work-based learning), how did you manage to transfer the content to the online environment?”

The possible answers were:

- Video presentation (with or without comments)
- Teacher's/trainer's story telling (only audio)
- Static presentation (text and images, commented by teacher/trainer), Video presentation (with or without comments
- Static presentation (text and images, commented by teacher/trainer)
- Teacher's/trainer's story telling (only audio), Video presentation (with or without comments)
- Teacher's/trainer's story telling (only audio), Static presentation (text and images, commented by teacher/trainer)
- Teacher's/trainer's story telling (only audio)
- None of the above

The two most frequently chosen responses were related to video presentations (with or without commentary) and the combination of teacher's/trainer's storytelling (audio only) alongside video presentations.

Approximately 85% of respondents indicated that they do not use advanced digital tools to simulate real-world scenarios in their distance training courses. The remaining 15% who do use such tools utilize platforms like **Dmagis**, **phet**, **Miro**, and **Padlet**, as well as more specialized simulation tools such as Rhinoceros, Mathcad, and LTSpice.

Additionally, over 82% of respondents (96 in total) expressed interest in testing these tools in their future training courses.

4.4 Experience made and lessons learnt

Section IV of the Questionnaire aimed at investigating the following topics:

- Topic 1: Knowledge on best/good practices in the field of distance learning,
- Topic2: Lessons learnt during the pandemic from COVID 19 when the training activities were possible only in online or distance learning modalities,
- Topic 3: Knowledge and use of handbooks, guidelines, methodologies supporting distance learning.

As for **Topic 1**, the following question was proposed to the respondents:

"Are you aware of tools, practices or systems of vocational training and work-based training that can be considered "good practices" and, therefore, that are replicable or useful in other European contexts / countries (for training providers and / or for public decision makers)?"

Only few of the respondents (less than 10%) declared to know some good practices.

As for **Topic 2**, the following question was proposed to the respondents:

"What are the lessons you learned following the implementation of distance / online training, before and after the COVID-19 pandemic, in relation to the delivery processes, the role of trainers and the new skills needed?"

The following key lessons learned – presented as "needs" – can be extrapolated from the 25 responses received on Topic 2:

- **Need for training** in technologies, methodologies, and tools specifically tailored for distance learning (both theoretical and practical).
- **Need for platforms/tools** designed specifically for collaboration (both between teachers and students, and among colleagues).
- **Need for specialized tools** that support active learning processes in distance learning environments.
- **Need for agility** in adapting quickly to new technologies.

As for **Topic 3**, the following questions were proposed to the respondents:

"Do you know / refer to specific guides or manuals to support the provision of distance / online training, to the trainers / teachers you want to share?"

Almost all the respondents declared that they don't know any specific guides or manuals.

5. User “Personas” analysis

5.1 Focus Groups

The primary objective of the Focus Groups was to gather *insights on current and future needs regarding the topics already explored in the questionnaire* distributed to trainers. Specifically, the aim was to listen to the perspectives of those directly involved and collect additional feedback to inform the development of the Toolkit (Result 2) and Training Modules (Result 3).

The investigation focused on four key areas: **“Activities”**, **“Needs”**, **“Ambitions”**, and **“Difficulties/Frustrations”** experienced by VET trainers, teachers, and professionals when providing distance learning.

The investigation was built upon the results of the Desk Research and the Survey, the Focus Groups delved into recurring themes and skill gaps identified among VET professionals, in line with the “DigCompEdu,” the European framework for the digital competencies of teachers and trainers.

Focus Groups were conducted in each Country of the partnership (Austria, Italy, Slovenia and Spain), following a methodology agreed upon by all project partners.

The specific objectives of the Focus Groups were:

- To expand on the areas of “Needs” and “Gaps.”
- To explore the “Difficulties” and “Frustrations” experienced by VET professionals in relation to distance learning.

Each partner compiled reports based on the answers provided by the participants. The questions posed to participants were structured in alignment with the "DigCompEdu" framework. The table below presents a summary of the responses received, organized by thematic areas.

Area of the Needs	N° of replies	Score
QUESTION: based on your experience in distance/online training pathways, which are the most important/urgent needs you would like to satisfy to increase the impact of the trainings?	*ANSWERS*	
1. Have a better knowledge of the digital environments (websites, cloud servers, search engines, social media outlets, mobile apps, audio and video, and other web-based resources)	4	*Not very urgent*
0. Make recourse to a "customized" platform for the management, protection and sharing of the digital resources for the didactics to use in distance/online learning courses	22	*Urgent*
0. Have a better knowledge of the digital education resources (video) and tools to be able to select the most appropriate	4	*Not very urgent*
0. Capacity to make recourse and use of formats and software for creation (adjustment) of the education contents for the students	10	*Medium*
Sub-Area 1: Digital resources and teaching and learning practices	N° of replies	Score
QUESTION: based on your experience in providing online/distance training pathways, which difficulties/frustrations have you encountered in the process of searching/selection/uses of digital methodologies and resources to use in distance/online learning?	*ANSWERS*	
1. Difficulties in finding digital contents to support the courses/lessons (long searching times and/or inadequacy of the contents found)	8	*Medium*
0. Impossibility/difficulties in modifying the digital resources available	*0*	*Not very urgent*
0. Difficulties in the creation of new digital resources customized for the online/distance learning	6	
0. Impossibility/difficulties in the process of integration and sharing of the digital resources into the training platform	10	*Urgent*
0. Scarcity/lack/no-knowledge of methodologies and tools customized for distance learning to support the students in the completion of collaborative tasks and/or in improving their communication skills and/or in the supporting their collaboration and the creation of sharing knowledge	11	*Urgent*
0. Scarcity/lack/no-knowledge of methodologies and tools to support students in the process of planning, monitoring and self-assessment of the level of learning acquired and in highlighting the progress made, in sharing knowledge and in setting out and propose creative solutions	5	*Not very urgent*
0. Other	*0*	
Sub-Area 2: Evaluation of the learning acquired (use of digital tools and strategies aimed at improving evaluation practices):	**N° of replies**	**Score**
QUESTION: based on your experience in online/distance learning, which difficulties/frustrations you encountered when you faced with the assessment of the students' learning?	*ANSWERS*	

1 Lack/no-knowledge of methodologies and tools specific for the assessment of the competences acquired in distance learning courses	*28*	*Urgent*
2 Lack of integration of the learning assessment/evaluation systems into the training platform and/or deficiencies in the tools for the analysis of the learning data and/or in the tools to provide feedbacks to the students and other concerned persons	*12*	*Mediumt*
Sub-Area 3: Enhancement of students' potential (Using digital technologies to foster greater inclusion, personalization and active involvement of students)	**N° of replies**	**Score**
QUESTION: Based on your experience in online / distance learning courses, what difficulties / frustrations have you encountered in enhancing the potential of students, in terms of:	*ANSWERS*	
1. Accessibility and inclusion?	10	*Medium*
0. Differentiation and personalization of the paths?	18	*Urgent*
0. Active participation?	12	*Medium*

5.2 Definition of the "Personas"

Personas are idealized, fictional profiles developed through research that represent specific customer groups who may interact with a product, service, or website in similar ways. Defining personas is valuable for various reasons, including gaining a deeper understanding of the target users—their needs, fears, and goals. This understanding is crucial because, in any marketing strategy, the customer and their experience with the company or product are central. By creating personas, a user-centered approach becomes possible.

Through persona creation, the **end user** becomes more tangible to those designing the product, service, or website. This makes the design process easier, as understanding the behaviors and characteristics of the target audience allows for more effective design decisions. Moreover, by understanding potential users in this way, designers can empathize with them, designing products that solve their problems and help them achieve their real goals. This, in turn, fosters exceptional **user experiences**.

For Result 1 (R1) of the ECHOES Project, defining personas is crucial for identifying **typical profiles to whom solutions and products developed in Results 2, 3, and 4 can be tailored**.

We have developed **five typical personas** based on the national contexts analyzed, each capable of addressing common needs across various age groups. These profiles are listed below.

Name: Alice **Age: 32** **Profession: Coach / Mentor** 	
ACTIVITY	**Alice** is 32-year-old. She has been teaching in education for about 4 years and has good knowledge of technology and online tools (computers, office package, social media, video conferencing and e-learning platforms). She is often close in age to the students she teaches, so she finds it easy to integrate with students. In fact, she has a good ability to encourage them to collaborate with each other, trying to inspire and support them in creating innovative approaches to solve problems, promoting their work, and motivating them. She has often used video conferencing platforms and e-learning platforms (Moodle and Docebo LMS). Alice is very often involved in 100% distance learning courses, but she prefers the hybrid teaching mode, especially when practical learning is concerned. She makes recourse to videos, images, and slide presentations for his trainings, but she would like to use digital simulation tools.
GOALS AND AMBITIONS	Alice would like to provide teaching for online training regardless of the course type and the users involved.
NEEDS	Alice would like to know better effective Virtual Learning Environments (VLE), especially those characterized by ease of use and intuitiveness. When Live Distance Learning is concerned, she would use a platform where interaction is allowed and sharing of information and multimedia contents (presentations enriched with Flash animations and transitions, 3D objects and video streaming, etc.) is enabled during and outside the training sessions.
DIFFICULTIES AND FRUSTRATIONS	Alice finds very difficult to deliver the practical courses effectively when distance learning is concerned. She is frustrated from the fact that the platforms she uses are not user-friendly and don't allow any interactions or collaboration among teacher and students and among students.

Name: María
Sex: F
Age: 35
Profession: VET Online Trainer

Activity:	Maria is 35 years old. She is an online trainer in vocational training courses for employment (Online VET). She has 5 years of experience in training, most of which have been dedicated to online training directly. She always works with non-proprietary platforms especially dedicated to e-learning, although she considers that she can still discover new tools that she needs to improve. He has a good knowledge of office automation, social networks and digital content creation. He attaches great importance to the relational and motivational aspect of her work with learners, as she likes to establish not only a strong and secure connection with them, but also group awareness among the participants of the online training sessions (even if they are not synchronous).
Goals and Ambitions:	Maria would like to be able to use digital reality tools. She would like to be able to create digital content that is more focused on practicality, she wants to try new tools that allow a better focus on practical activities in the online environment so that her students experience the training as something real and not far from what awaits them later in the real/working world. He would like to be able to manage the whole training process (design, delivery and evaluation of learning) remotely.
Needs:	Maria would like to know how to apply more practical content in online training, she is also interested in digital reality tools because she thinks they can be a good option. She needs a platform where this type of content can be hosted for online training in a simple and intuitive way, so that both trainers and students dare to use it.
Difficulties and Frustrations:	Maria has difficulties in finding practical digital content and tools to produce it. She tries to research and look for tools to apply digital reality but she does not know how to do it. In addition, the management and control of the whole educational process also makes her look for alternatives to improve her evaluation and control of the students' process in order to know how to help them, guide them in a better way and increase their engagement and empowerment.

Name: Matej **Sex: M** **Age: 38** **Profession: CEO of a company / startup mentor**	
Activity	Matej (male) is 38 years old. He's the CEO of a high-growth company (scale-up). He's an active startup mentor in the entrepreneurial community of Primorski tehnoloski Park and gives various lectures at startup academies and similar trainings. His company works in the field of IT technologies, so online tools are very familiar to him. If he doesn't know certain online tools, he's able to learn them quickly. Matej has been working as a startup mentor and lecturer since 2014. He's a young father and very busy as he manages a company with ten employees. He started online teaching/mentoring during the Covid period. For various practical reasons, such as lack of time, physical distance, etc., he still uses the online method of teaching entrepreneurship from time to time. Most commonly, he uses tools such as: Zoom, Skype, Microsoft Teams, Moodle and Miro (online whiteboard platform). He also often teaches hybrid. He may not need so many virtual tools to teach entrepreneurship as the practical nature of entrepreneurship is different from practical nature of chemistry or physics, but he still uses videos, photos, graphics, etc. Recently, Matej was on a study visit to Norway where he attended a conference on virtuality. The conference was about the inclusion of virtuality in all areas of society, including teaching. He found it very interesting how a modern way of teaching history was presented at the conference: students were transported to the time of a certain part of history (e.g., ancient Greece) with the help of VR. In this way, we can solve the problem of motivation to sit in an online lecture.
Goals and Ambitions	Provide high quality knowledge on entrepreneurship, regardless of format (live/online). He's happy to continue to keep in step with the times and teach in a way that's relevant to modern society and its needs.
Needs + Difficulties and frustrations	Matej is a busy entrepreneur who's to take care of 10 employees. He's also a young father who's building a new house in his spare time. At the same time, he wants to be an active member of the local entrepreneurial community, to which he'd like to contribute with his knowledge and experience. Due to the lack of time, he wishes that he doesn't have to search for suitable platforms and that he doesn't have to search for different applications to combine in a lecture (to make the lecture more interesting and practical), but he wishes that there's a platform that's easy to access, simple, and most importantly, a platform that contains different options and applications - all in one. This would save him a lot of time. After all, he doesn't have the time to sit down at the computer and search "all day" for suitable platforms and applications.

Name: Oliver **Age: 43** **Profession: HT Teacher in technical theory lessons**	
ACTIVITY	Oliver is 43 years old and has been working as a HTL teacher in the field of mechanical engineering/mechatronics/economics for a good 4 years. Prior to that, he was employed for 20 years in various companies in the medical technology, automotive and consumer lifestyle sectors, as a design engineer, project manager and supplier supervisor in the private sector. He has been involved with learning platforms for 4 years. The last 3 years he has been using learning platforms (MS Teams) as a teacher at the HTL. In the course of his education at the pedagogical university he got to know various digital learning tools (Moodle, Kahoot!, Microsoft Forms, MS Teams...) as a learner. He has knowledge to prepare digital content for his teaching.
GOALS AND AMBITIONS	Oliver would like to prepare his learning materials in such a way that they can also be used as interactively as possible by the students via learning platforms at any time. In doing so, he wants to use courses that teach the basics in the area of mechanical engineering/manufacturing technology. An automated knowledge check is essential.
NEEDS	Oliver would like a learning platform in which courses in the field of mechanical engineering/manufacturing technology can be compiled as easily as possible and made available to learners. It should be possible to test what has been learned with the help of learning objective checks. In addition, the learning platform should include an automated evaluation of the learning target checks.
DIFFICULTIES AND FRUSTRATIONS	Oliver is currently not aware of any learning platform that meets all his requirements. There are very few reasonable digital documents available in his teaching area. Preparing reasonable digital documents is very time-consuming. Oliver does not have the knowledge to adapt the hardly available digital media for his area to his needs. Assessing learners is very tedious and time-consuming with the tools currently in use.

Name: Davide **Age: 58** **Profession:** **Professor**	
ACTIVITY	**Davide** is a 58-year-old professor who has been working VET for more than 10 years. He has a more than acceptable technological and internet tool expertise. He often uses video conferencing and e-learning platforms and has the skills to inspire and interact with his pupils, urge them to complete assignments, and encourage them to collaborate. Anyway, he prefers in-presence training than distance training.
GOALS AND AMBITIONS	Davide would like to find easy-to-use sharing and collaborative tools in platforms used for distance learning, such as: blogs and discussion forums, podcasts and videos. He would also like to learn how to use simulation tools.
NEEDS	Davide needs ease of use and intuitiveness platform equipped with tools stimulating collaboration and interaction among teachers and students and among students, especially when practical learning is concerned.
DIFFICULTIES AND FRUSTRATIONS	Davide experienced difficulties delivering 20–34-year-oldsng, mainly because he uses video-conferencing platforms not equipped for distance learning. So, he is frustrated by the lack of tools for management, protection and sharing of the digital didactical resources. Delivering of contents is difficult for him when the practical learning is concerned. In fact, he doesn't use simulations, gamifications, augmented or virtual reality, but only videos and images, slides and storytelling.

6. Conclusions and next steps

In conclusion, based on the results of the desk research, questionnaires administered to VET professionals, and the focus groups, "Needs" and "Gaps" related to distance and virtual learning for VET and WBL projects in Europe have been identified.

The table below provides a comprehensive synthesis, fully aligned with the needs and categories outlined in **DigCompEdu**, the European reference framework for the digital skills of teachers and trainers.

Area	tasks	Needs	Desired state	Description of the gaps	Italy	Spain	Austria	Slovenia
Area 1: Professional Engagement								
	Organizational communication	Course documentation management	Complete and simple management of training documentation	Since videoconferencing tools, not customized for training, are the most used in distance courses, the document flow is managed offline	x	x	x	x
		Digital technologies as a tool for communication with students	Better distance communication process and more interesting physical educational process	A communication platform that contains different options and applications - all in one to make the lectures more interesting and practical: a platform that contains different options and applications, allows for a lot of interaction, practice, and group work.			x	x
	Professional Collaboration	Exchanging experiences with other mentors	and teach in a way that's relevant to modern society and its needs	Only a few innovative practices are used within education process, additional training of mentors, lecturers is needed			x	x
		Sharing exams, assignements, quizes across the organization	Every trainer has access to all exams, assignments and quizes of the others	Training on learning platforms should overcome this			x	
	Reflective Practice							
	Digital Continuous Professional Development	Keeping young people motivated	The use of different digital tools in order to motivate the students	The digital tools such as VR, AR should be used in the educational process resulting in the enrichment of the lectures. Psychological approaches to maintain motivation are needed			x	x

Area 2: Digital Resources								
	Selecting digital resources	Access and use of platforms	Ease of use and intuitiveness	Only a few professionals have good or acceptable knowledge of learning platforms	x		x	x
		Access and use of platforms and applications	Ease of use	The platforms are dispersed, applications are difficult to find (on Web) or mentor needs a lot of time to search			x	x
	Creating and modifying digital content	Use of educational objects	Availability of effective Learning Objects to facilitate, evaluate and verify the study process or create a course in a digital/virtual environment	Lack of knowledge about available Learning Objects	x	x	x	x
		Create more complex practical contents	Availability of create not only Theoretical content for trainings in the digital environment but also practical, hand-on activities and contents.	Lack of knowledge about tools and methodologies to produce this type of content		x	x	
		Modifying content to your own purposes	Easy and intuitive tool of editing content.	Lack of knowledge on tools.			x	
	Managing, protecting and sharing digital resources	Effective streaming sessions (Live Distance Learning)	Possibility to receive information with multimedia contents, such as: audio, video, images, text, etc.	It is not possible or rather difficult to receive multimedia content during streaming sessions	x			x
		Improve content sharing	Ability to share information and multimedia content during and outside of live lessons or webinars	Since most of the courses are carried out through videoconferencing systems, it is quite difficult to share information or multimedia content	x			x

Area 3: Teaching and Learning								
	Teaching							
	Guidance	Interaction with users	Interactive lesson	The interaction is limited to simple tools typical of videoconferencing platforms, such as: raising of hands,	x		x	x
		Management of live lessons	Easy management of live training sessions	Since video conferencing tools, not customized for training, are most used in remote training courses, managing training sessions is quite	x			x
		Management of live lessons	Easy management of live training sessions	The need for a lot of digital and technical equipment not only on the part of the provider (educational institution), but also on the part of			x	x
	Collaborative learning	Difficulty to engage students to collaborate between them	Availability of encourage students to collaborate and work together in the digital environment	Lack of knowledge about how to promote, encourage and facilitate tools for promoting students to collaborate (on their own among them) in the digital environment. It can be also linked to the lack of knowledge suggesting initiatives or activities for learners to collaborate. The design and implementation of this type of activities required domain of digital tools and digital communication competencies.		x	x	
	Self-regulated learning							

Area 4: Assessments								
	Assessment strategies							
	Analyzing evidence	Training monitoring	Complete and simple training monitoring (process and learnings)	Since video conferencing tools, not customized for training, are most used in distance courses, training monitoring is quite difficult and very often managed offline	x	x	x	x
	Feedback and Planning	Design, planning and implementation of the use of digital resources in the different phases of the learning process	Effectively orchestrate the use of digital resources at different stages and settings of the learning process	Lack of knowledge of educational resources (provided or not by platforms) specific to distance learning	x	x	x	x
		Effective feedback during the assessment process	Being able to engage learners according to the feedback in their activities and progress.	Lack of knowledge regarding tools, frequency, type of feedback and channel for it.		x	x	
Area 5: Empowering Learners								
	Accessibility and inclusion							
	Differentiation and personalisation							
	Actively engaging learners	Interaction with students and their active involvement in a subject	Use of digital resources to enhance interaction with students, individually and collectively, inside and outside the learning session	Lack of knowledge of teaching resources (provided or not by the platforms) specific to distance learning	x	x	x	x
		Keeping young people motivated	The use of different digital tools in order to motivate the students	The digital tools such as VR, AR should be used in the educational process resulting in the enrichment of the lectures. Psychological approaches to maintain motivation are needed.			x	x
Area 6: Facilitating Learners' Digital Competence								
	Information and media literacy							
	Digital communication and collaboration							
	Digital content creation	Practical activities, laboratories and Work Based	Effective use of simulators, virtual reality and augmented reality in Virtual Learning Environments (VLE)	Only a few professionals have good or acceptable knowledge of digital learning games or apps and virtual reality	x	x	x	x
	Responsible use							
	Digital problem solving							

The table above provides a summary of the **key challenges identified through the European-level comparative analysis**, incorporating data from various questionnaires and focus groups. These findings were further refined through the development of *Personas* and summarized schematically, following the categories and definitions outlined in **DigCompEdu**, the European reference framework for the digital competences of teachers and trainers.

This work is crucial for the project, particularly in guiding the activities outlined in Result 2 (R2), which focuses on the development of the Toolkit. The **ECHOES Toolkit** aims to be a practical and valuable resource for implementing innovative methods in VET projects delivered through virtual and extended classrooms. It will provide practical tools and methods tailored to the needs of trainers, mentors, and staff involved in virtual online training and mentoring processes.

The Toolkit will align with **DigComp**, the European Digital Competence Framework, and its proficiency levels, adjusted to account for specific country contexts. The target group for this result includes online trainers and mentors, teachers, associations, and communities of trainers and mentors, as well as practitioners working within the I-VET and C-VET systems.

The virtual/online training resources and materials developed will be adapted for VET projects, focusing on the main areas of VET:

- Training and Work-Based Learning,
- Mentorship
- Accompaniment to Self-Entrepreneurship and Business creation.

The practical contents, methodologies, activities, dynamics, and resources within the Toolkit will be central to the pilot trials organized in each partner country. The **ECHOES Toolkit** will be structured according to **DigComp**, the European Digital Competence Framework, with proficiency levels tailored to each country's specific context.

Building upon the insights from the first project result, methodologies, practical contents, and resources will be identified through a stocktaking of existing instruments, highlighting their pros and cons. The first methodological decision in designing the **ECHOES PR2 Toolkit** is to use the **DigCompEdu Framework**, focusing on the *Areas* and *Competences* that teachers and trainers should possess. This approach ensures a smooth transition from the R1 analysis to the development of the R2 tool. Furthermore, the analysis will serve as the foundation in the designing of the Training Course (Result 3) and the ECHOES Open Educational Resource - OER (Result 4).