**BREATHE THE FUTURE-HYBRID EDUCATION IN VET**

# PR1: Methodology of hybrid education in VET schools

**Developed by IPSantarém**

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# 1   Introduction

*hVET Project*

The main objective of the hVET project is to prepare VET schools for the new, post-pandemic education. The project aims to achieve that goal by creating, testing, and implementing a hybrid education model with a set of tailored tools, resources, materials for VET educators, trainers, practitioners, and learners. The tools will support VET educators to be effective in this new hybrid setting to drive participation and collaboration among learners, boost learners' motivation and inspire both pedagogical staff and learners despite educational disruptions. Possible future educational disruptions could be driven by new pandemics, but also by war and climate change effects, such as heat waves and flooding.

hVET project online page: https://hvet.eu/

*hVET manual*

This manual introduces a new paradigm for teaching and learning in VET schools, presenting a hybrid education model where the best features of online and face-to-face education are optimized to provide the best teaching and learning experiences for VET educators and learners.

In the second chapter, "*The future of education for VET schools: Hybrid education*", the transition from in-person to online learning is going to be explored with focus on the e-learning models. Then, the conceptualization of hybrid education is going to be presented, stressing the benefits and the challenges of hybrid education.

 After this intro, educators will know the main features of the hVET hybrid educational model in the third chapter, based on the 7E teaching model.

The hybrid educational model has a strong connection with companies, links that are explored in the fourth chapter "Companies' role on VET hybrid education".

The fifth chapter, "Competency profile of the VET hybrid educator", presents a list of eight competences for the VET educator who is going to conduct a hybrid educational model.

The core chapter is chapter six, which presents a diversity of ideas, strategies and tips for the VET educator to implement hybrid education.

Taking in account that the hybrid educational model depends highly on ICT, the final chapter presents content about facilities, equipment, ICT resources and technical support needed for the VET educator to conduct proficiently hybrid education.

*Target audience*

This manual is for VET educators, VET headmasters, VET officers and other professionals interested in VET education. Those who are interested in VET education can learn enhanced hybrid education techniques and tools for the preparation of the future of VET education.

## 2 The future of education for VET schools: Hybrid education

**Start-up**
The future of hybrid education in VET schools appears promising as it can enable greater customization of teaching tailored to individual student needs. Additionally, hybrid education can expand access to quality education by offering flexible and inclusive learning opportunities.

### 2.1 From in-person to online learning

**Start-up**
There are many ways of providing education, being the in-person or face-to-face (F2F) learning the most usual. However, distance learning and, more recently, e-learning have an increasing space in education.

*Distance learning definition*
Distance learning can be defined as any learning setting where educators and learners are physically separated (Martin, 2003). Distance learning can be achieved from low-tech correspondence courses through high-tech processes (Martin, 2003).

*e-learning definition*
An initial definition of e-learning characterized it as a subset of distance learning and uses mainly audio, video, and computer delivery modes (Figure 1) to foster learning (Martin, 2003).



Figure 1. e-learning setting (Credits: Pixabay)

*e-learning models*

Later, e-learning was complexified and organized in two major models (ViewSoinc, 2021):

- Blended learning (b-learning), a model that uses online self-paced learning to supplement F2F teaching, but it still focuses primarily on educators and learners being physically present for most of the teaching time
- Online learning, which is a course that is entirely online.

Figure 2 presents a visual which captures the main ideas of the previous models.

More face-to-face learning ⟷ More online learning

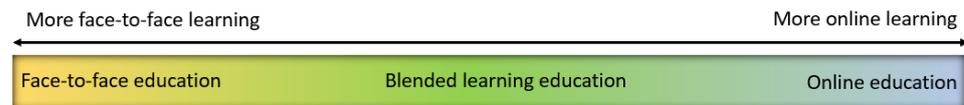| Face-to-face education | Blended learning education | Online education |

Figure 2. Visual of the face-to-face, blended and online learning models (Credits: Authors).

Educator training, as well as professional development strategies, must serve the purpose of strengthening pedagogical competencies that will facilitate the design of courses, activities and resources that combine face-to-face and distance learning (UNESCO/IBE, 2021).

B-learning sometimes is used with the same meaning of hybrid learning, but in the hVET project the hybrid learning characterization presented in the next sections is going to be used.

## 2.2 Hybrid education model

*What is hybrid education?*

Hybrid education is a theme that has received continuous attention from educational researchers since the beginning of the 21st century. The hybrid educational model merges the characteristics of online education and the interactivity that typically characterizes in-person classroom education and was created to answer to the demands of non-traditional adult learners (Martin, 2003). Gamage *et al*. (2022) state that moving to a hybrid method of learning and teaching would be a better decision than an exclusive online method, because the online platforms have drawbacks that are beyond human control.

*Framing hybrid education*

Sometimes is attributed to blended learning the same meaning of hybrid learning, however ViewSonic (2021) considers that while blended learning encompasses all education that integrates digital technologies, especially based learning tools, the hybrid learning refers specifically to synchronous lessons that are taught live and remotely at the same time. The College of DuPage (s.d.) characterizes hybrid learning as a cohesive experience between F2F and online teaching. For Bülow (2022), in synchronous hybrid

teaching, learners in different locations, some on-site and others online, engage in learning in a shared learning space. The University of Edinburgh (2021) also places the focus on teaching and extends further this approach considering that hybrid teaching consists of a mixture of digital and on-campus activities, where learners may be able to attend on-campus sessions, digital sessions in the same time zone, or digital sessions in a different time zone.  A visual that frames hybrid education with the other models is presented in Figure 3.
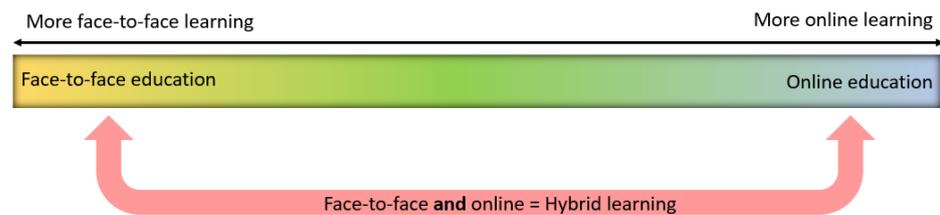


Figure 3. Relation of the hybrid model with the face to-face and the online educational models (Credits: Authors).

*Hybrid education model*

Considering the previous ideas, in the hVET project we created the following definition for a hybrid education model, taking in consideration the students' role:

> A hybrid education model is when some learners engage in in-class, face-to-face (F2F) education, while other learners undergo out-of-class, online education.

The hybrid education model allows some learners to attend a class in-person, while others can join the class online, from anywhere (Neelakandan, 2021) (Figure 4).
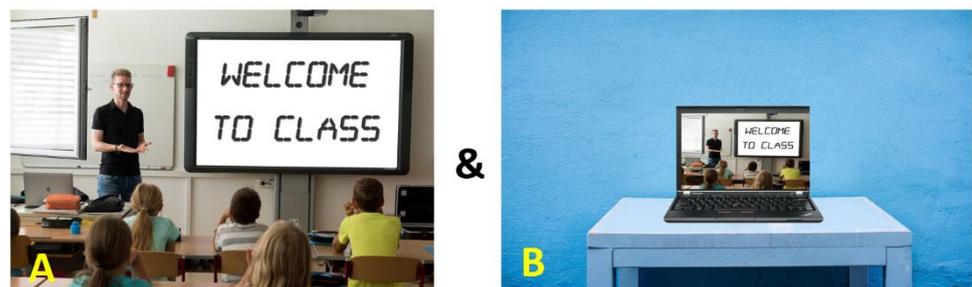


Figure 4. The hybrid education model implies F2F (A) and online classes (B) at same time (Credits: Adapted from Pixabay).

Moreover, hybrid models are pluralistic, because they do not imply a single model of organization, and do not function equally and in the same manner for all educational centers (UNESCO/IBE, 2021). Good practices of hybrid learning are characterized by a regular learner- educator contact, learner- learner collaboration moments, active learning methodologies,

prompt feedback to the learners' work, better time management, improved scholarly discourse and respect for diverse talents (Martin, 2003). Taking in consideration these features, we propose an extended definition of hybrid education for VET settings:

*Hybrid education definition for VET settings*

In **hybrid education** for VET settings some learners engage in in-class, face-to-face education while others undergo out-of-class, online education. **Hybrid teaching** should be focused on active learning approaches that trainers can use to teach online and F2F learners at the same time using ICT tools, to develop the VET learners' knowledge and skills, in close cooperation with companies. This model recognizes the VET learners as the main participants of hybrid education and assumes interaction, inclusion and cooperation between all participants using ICT solutions. Through **hybrid learning**, VET learners should actively develop their knowledge and professional skills in F2F or online situations, according to their previous knowledge, pace, motivation and skills, but also taking in consideration the companies' needs.

## 2.3 Benefits and challenges of hybrid education

**Benefits**

*Flexibility and affordability*

Flexibility (Neelakandan, 2021) and affordability (Neelakandan, 2021) were reported as general benefits of hybrid education. Hybrid education offers flexibility by combining traditional in-person learning with online components. This flexibility benefits both students and educators concerning the learning schedule and the location of learning. Concerning affordability, hybrid education can lead to cost savings for both students and educational institutions, making education more accessible to a wider range of learners. Affordability is the result of benefits such as reduced commuting costs, lower infrastructure costs, access to online resources, time and resource optimization.

*Motivation*

The individual is motivated to become the subject of their own learning, to apply what they are learning, to evaluate itself (Rurato *et al.,* n.d.).

*Learning ownership*

Hybrid teaching can also allow the learners to take more ownership of their learning (Frimming et al., 2013). In certain moments of their progress, students can have liberty to study of their own pace.

*Openness*

Diversity and breadth of course offerings, eliminating barriers and access requirements, serving a large and dispersed population with different learning needs (Rurato *et al*., n.d.).

*Active participation*

The learners seem to appreciate the creation of an online learning environment that exposes them to different points of views, lets them express and explore their own views, and supports them in formulating their own opinions (Martin, 2003).

*More contact with learners*

Educators reported that they have more contact with learners in the online classes (Figure 5) than in the traditional in-person classes and this is relevant because it is associated with learner motivation (Martin, 2003).



Figure 5. Sometimes hybrid education improves the contact between the educator and the learners (Credits: Adapted from Pixabay).

*Similar performance*

Learners in the hybrid learning courses achieved learning outcomes at a level equal to or higher than the traditional in-person classes (Martin, 2003).

**Challenges**

Hybrid education is challenging for the educator and could be difficult to implement in VET courses with a high practical hands-on component.

*Adaptation*

Due to that reason, the implementation of hybrid VET education needs adaptation and specific resources that can be used simultaneously in-person and online. Therefore, one challenge is to find the optimal mix of online and face-to-face education that will leverage the major advantage of asynchronous learning, related with the fact that it can be approached any time and at any place by the learner, while maintaining quality educator-learners interaction (Martin, 2003).

| | |
|---|---|
| *ICT problems* | Inappropriate equipment, infrastructures, educational platforms, and technical support are also other constraints to hybrid education, since teachers and students depend heavily on the technological set up for hybrid lessons. Being highly dependent on digital technologies and equipment, some constraints could prejudice the proper development of this model, such as learners who do not have personal computer or laptop, insufficient digital training or have poor access to the internet. Devices such as laptops, cameras, speakers, microphones, need to be set up from different angles to speak, to be seen and to be heard simultaneously. Stable internet connections are essential to provide hybrid education (Hussain & Shahzad, 2019; Rasheed, Kamsin & Abdullah, 2022). Educators should give proper attention to the learners' conditions in their home environments or other spaces they use for online learning.  Educators must also experience comfort with the ICT technologies to manage the course properly (Martin, 2003). |
| *Educator style* | Educators who have a fluid and less structured teaching style seem to experience more success in hybrid education (Martin, 2003). |
| *Resilience* | Educators need to be familiar with not just the strengths of online and face-to-face teaching in their own rights, but also with how they can feed into each other over a longer term (College of DuPage, s.d.). Another challenge in teaching in hybrid learning environments is mentioned in the Shifaza *et al*. (2022) study who alerted for the "heavy mental load on the teacher, who must pay attention to students' learning in two different environments simultaneously" (p. 21). |
| *Rethinking the organization of curriculum* | Hybrid models imply rethinking the organization and hierarchy of knowledge in the curriculum, as well as group and personalized instruction times (UNESCO/IBE, 2021). This is based on an understanding that each learner may require different combinations of face-to-face and virtual training to engage with, develop and achieve the objectives and learning outcomes set (UNESCO/IBE, 2021). |
| *Supervision* | Hybrid education curriculum should clearly identify learners' skills that must be developed with in-person supervision and the skills that can be developed without direct supervision, using online settings. For example, some skills cannot be performed without the learners' supervision for safety reasons, such as the ones related with professions such as drivers, chemical analysts or nurses. In those cases, close supervision by an educator is required. |

*Keeping learners motivated*

Another difficulty is to engage and keep the VET learners motivated along time. In tehri study, Shifaza *et al.* (2022) reported that some students mentioned lack of motivation and boredom. Therefore, it is important for staff and students to work in partnership to make instruction and the curriculum meaningful and relevant to the learners.

Frimming *et al.* (2013) alerted that the students in in-person classes displayed better involvement and engagement than those who studied online. Shifaza *et al.* (2022) also stressed that remote students can feel ambiguous about their sense of inclusion and group membership to the in-person learners, technology, and place. Shifaza *et al.* (2022) emphasizes that learning can be disrupted by repetition and slowing down of the lesson to respond in two different environments.

## 3    VET hybrid educational model

**Strat-up**

The VET hybrid education model provides a framework to educators prepare their work when some learners engage in in-class, face-to-face (F2F) education while other learners undergo out-of-class, online education.

### 3.1  The features of the VET hybrid educational model

*Features of the*
*VET hybrid*
*educational*
*model*

The next visual presents the main characteristics of the VET hybrid educational model (Figure 6). The model was developed for the project based on research, field work and the experience of the participants of the project on didactics, VET education and online education.
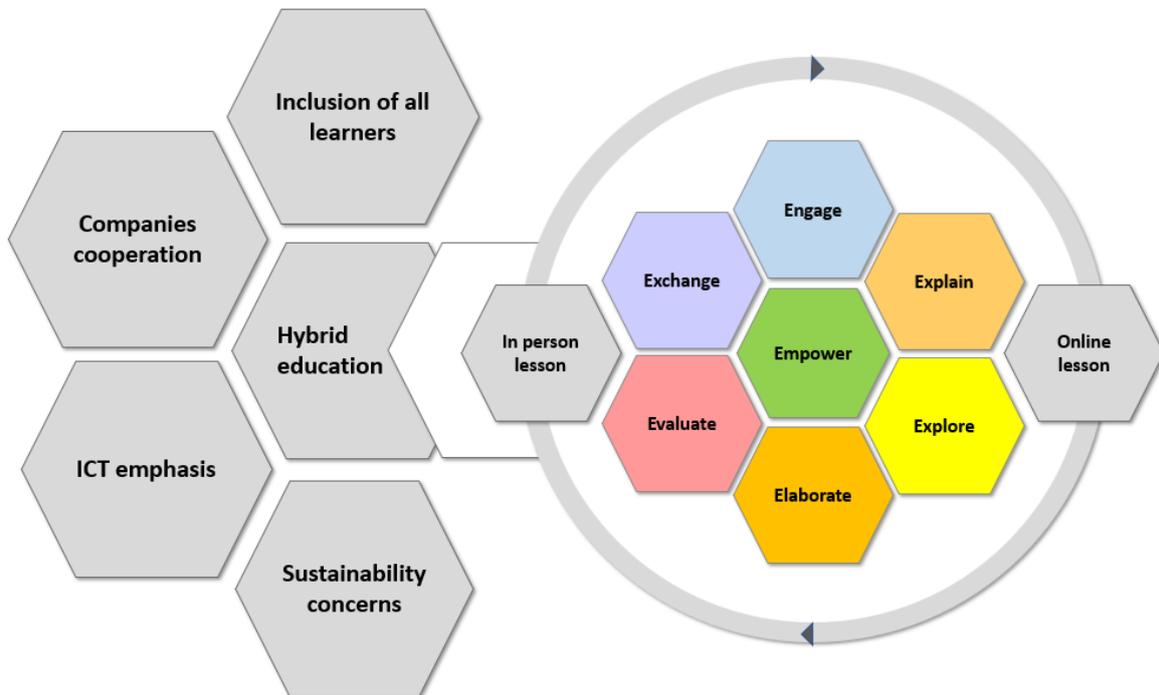
Figure 6. VET hybrid educational model (Credits: Authors).

**Theoretical approach**

The theoretical approach of the VET hybrid learning model is founded in the social nature of learning and foster cooperative learning to promote an inclusive learning environment. This model pretends to reach all VET learners according to their needs, rhythm, and motivations. With this hybrid model, even though the learners are not able to be present physically, they are given equal opportunities because they can attend the lessons online. The VET hybrid learning model is inclusive and recognizes the VET learners as their core participants and is focused on active learning strategies and educational technologies that trainers can use to achieve the educational goals. A key goal of the VET model is the VET learners' empowerment through their competences' development. Moreover, the hybrid VET model allows greater flexibility for different teaching and learning modalities.

**Inclusion**

The inclusion of all learners is highly important on VET education due to the promotion of equal access to opportunities, through the skill development for all. This can be done by addressing learning differences and taking advantage of the diverse perspectives, experiences and previous skills of learners. Promoting social integration and building empathy and tolerance among learners is crucial for the success of inclusion on VET settings.

**Companies cooperation**

The model also approaches the companies' needs by a close cooperation with them. In fact, companies are a key player of this model. Teaching planning and teaching activities should be created in close cooperation with the company's needs, especially those where the learners' internships are going to occur. The online modality of this model prepares learners for working at distance, a common practice after the COVID-19 pandemic. This model, focused on promoting the autonomy of the learners, can also develop on learners the competences and attitudes needed for self-employment.

**ICT emphasis**

The model also has an emphasis on ICT. Equipment, and digital training of both educators and learners is essential to the effectiveness of this model.

**Sustainability**

Sustainability is a transversal concern of all actions under this model. According to Bianchi *et al*. (2022), sustainability "means prioritising the needs of all life forms and of the planet by ensuring that human activity does not exceed planetary boundaries" (p. 12). VET learners must keep in mind that they are part of and depend on nature and that mindset must be mobilized in their VET institutions and workplace. VET learners should be agents of sustainability in those environments.

## 3.2 7E teaching model

*7E teaching model*

One important feature of the VET hybrid educational model is being based on the 7E teaching model, which comprises the following teaching moments: Engage, Explain, Explore, Elaborate, Evaluate (Bybee, 2006), Exchange (Kähkönen, 2016) and Empower (Reis & Marques, 2016). Each of the previous teaching moments is adapted to VET education and further detailed in the next sections. In our model, the previous teaching moment are not sequential.
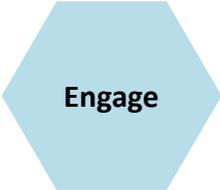
In the **Engage** moment it is important to understand VET learners' prior knowledge regarding the subject or problem being studied and promote connections between previous and new learning experiences. Motivating the learners and organising their thinking towards the learning objectives of current tasks is another aim of this moment. Our role, as VET educators, is to introduce and briefly explore the problem or the engage-task and cause a cognitive discomfort in learners to drive them to know more, explore and understand better the subject or problem.
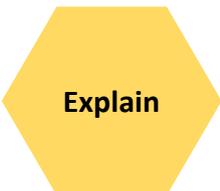
The **Explain** moment is used to focus the VET learners' attention on scientific details of a concept or process. One of VET educators' goals in the Explain moment is to provide opportunities for learners to demonstrate understanding of concepts, skills, values, and attitudes. When necessary, VET educators should support VET learners in their path to the understanding of concepts or processes, giving for example direct explanations or conducting them to further enquiry. The intention is to create, in class, an accurately scientific common language.

In the **Explore** moment, VET learners should be involved in hands-on and minds-on activities that help them generate new ideas, explore questions and hypotheses, design methodology for an investigation and conduct research. At this moment, laboratorial, digital, and other resources are provided to help learners in their inquiry. VET educators' role is to introduce activities and give learners the time and space to address the problem, considering their initial ideas. When requested, VET educators should guide learners in research design, clarify their doubts or help them find a path to a possible answer. In this moment, it is very important to promote group discussions and cooperative learning, giving opportunities for learners to present their ideas and receive feedback from peers. In some tasks, learners must work together to collect and share data that will be used to achieve collective answers to a problem.

The **Elaborate** moment is used to engage VET learners in new learning experiences by developing a more profound comprehension of the subjects addressed in previous tasks. One of the aims is to transfer the learners' knowledge to new situations, though related with previous ones. In this moment, group discussions and cooperative learning also have a main role in the learning process.
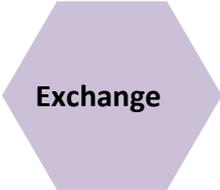
The **Exchange** moment includes the presentation, by groups of VET learners or individual learners, of what they have learned. In this moment, learners should present orally or elaborate synthesis of information using different digital resources, use proper scientific language, and be ready to answer questions placed by peers and/or by the VET educator.

The **Evaluate** moment provides opportunities for VET learners to assess their learning and skills. In this moment, it is very important to give feedback to learners, to change possible misconceptions. There can also be a more formal moment of assessment during or at the end of the learning sequence. The main purpose of the evaluate moment is to identify if the learner has achieved the learning objectives.

The **Empower** moment aim is to raise VET learners' awareness about socio-scientific issues through discussions and promote transfer of that knowledge to the community to help solving the problem.

## 3.3 Lesson examples

The lessons described in the next section presents how the VET hybrid educational model can be used (see Figure 7 and Figure 8).

Note that in hybrid education you do not need to use all 7E teaching moments in just one lesson. The idea is to choose the teaching moments that are more adequate to your lesson.

The suggested hexagon shape of the elements of the lesson plan helps to show the connection between the online and in-person activities.



| Lesson Plan | |
|---|---|
| **Modality** | Hybrid lesson |
| **Date** | ___ / ___ / _____ |
| **Time** | 10h00 – 12h00 |
| **Classroom** | VET 1 |
| **Learning goals** | Understand the characteristics of each SDG; Create a digital presentation to explain the features of the designated SDG |

**Inclusion**

Make sure all learners are organized in groups and no one is going to work alone.

**Companies' collaboration**

Suggest to the group who is going to work on SDG9 – Industry innovation and infrastructure, to contact a company

**Sustainability**

Make sure the SGDs are properly addressed, concerning the United Nations specific targets

**3. EXCHANGE**
Each group of students should present their findings to their peers using a digital support (such as Canvas). 5 minutes discussion about the presentation

**2. EXPLORE**
The online students should be organized in pairs, using synchronous rooms. Attribute an SDG to each group and tasks for that SDG exploration.

Online activities

**1. ENGAGE**
Present and discuss with the in-person and the online students a video about SDG

**4. EVALUATE**
The educator give feedback to the students about the quality of the product and the quality of the presentation.

**2. EXPLORE**
The in-person students should be organized in groups of 3-4 elements Attribute an SDG to each group and tasks for that SDG exploration.

In-person activities

**3. EXCHANGE**
Each group of students should present their findings to their peers using a digital support (such as Canvas). 5 minutes discussion about the presentation

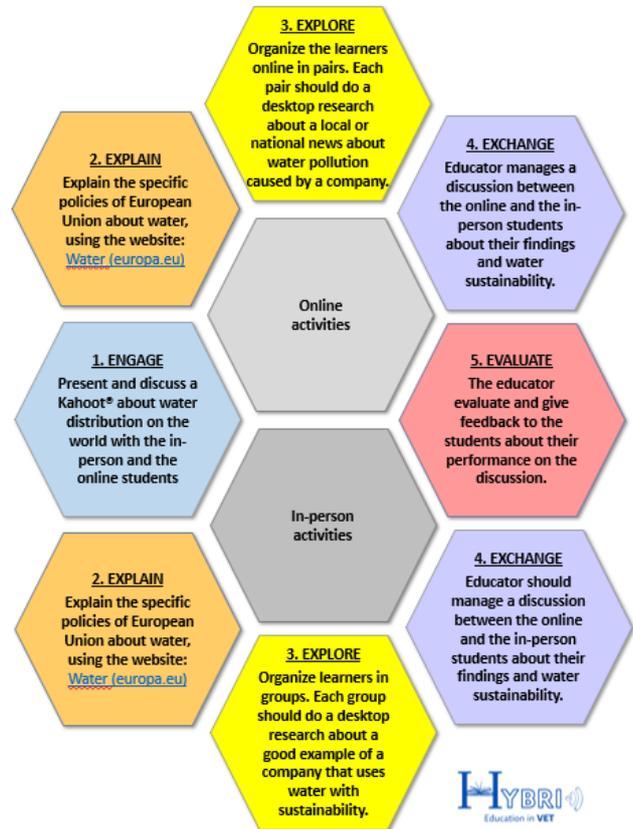Figure 7. Lesson example of the VET hybrid educational model (Credits: Authors).

Figure 8. Lesson example of the VET hybrid educational model (Credits: Authors).

## 4   Companies' role on VET hybrid education

**Start-up**

The role of companies in VET is crucial. Without the participation of companies, the preparation of VET learners to enter the labour market would not be at such a high level as it is today. Through the involvement of companies in education, students can develop practical skills and qualifications in real working conditions.

In this section, the role of the employer in different professional conditions of hybrid VET education is going to be explored.

*How to organise hybrid education in a company?*

VET at the employer' in a hybrid form is possible after appropriate preparation of instructors and learners. Hybrid education organized by the employer could take various forms, depending on the profession or industry in which the employer educates. The hybrid learning of skills for which computer equipment is required (e.g. professions such as graphic designer, accountant, programmer, computer network administrator) will look different comparing to professions in which the learner needs to be equipped with specialized equipment, devices and a place to work (e.g. bricklayer, barber, carpenter, locksmith, mechanic). Some skills cannot be performed without the employer's supervision due to safety reasons, therefore in such professions as a driver, chemical analyst or nurse, strict supervision of the instructor is required. In hybrid education it is necessary to precisely describe what skills can be developed without direct supervision.

An important element of preparing employers to conduct hybrid education is also determining the number of people who can join online stationery classes at the same time. This number also depends on the industry (profession) and the security conditions.

*The role of the employer in VET hybrid education in professions in which education is carried out with the use of computer equipment*

In industries where most professional tasks are performed with the use of computer equipment, education is also carried out in the same way. Employers usually have computers with specific parameters and dedicated software. Learners, during practical training with these employers, work on the same hardware and software. In these contexts of hybrid education, the employer should equip the learner with a computer and software. Sometimes, depending on the specifics of the company, the learner can install the special software on his/her computer. The employer should ensure that the license is provided without infringing the manufacturer's copyright and commercial rights.

In VET, when a learner joins on-line, the employer can have continuous contact with the learner using instant messenger such as Zoom®, Teams® or Webex®. The learner performs tasks, presents the results of his/her work on an ongoing basis and receives feedback from the instructor. An example of a learner's work station in this form of education is presented in Figure 9.



**1** | Webcam

**2** | Computer screen

**3** | Sound system (with built-in microphone).

**4** | Keyboard.

**5** | Mouse.

**6**| Work station (parameters and software are suggested by the employer).

**7** | Ergonomic chair

**8** | Possibility to connect via smartphone.

Figure 9.  Workstation example that can be used by a learner in VET hybrid education (Credits: Adapted from https://lordjahu.pl/)

To facilitate teaching and learning, instructors can prepare guidelines and short video tutorials on how to use various software functions in advance. This will greatly facilitate the learner's learning.

In this type of organization of VET in a hybrid form, it is important to remember about the principles of ergonomics as well as health and safety rules during working on the computer, as in the case of remote education.

*The role of the employer in VET hybrid education in professions in which education is carried out with the use of specialized equipment*

In professions such as mechanic, hairdresser or IT specialist, practical tasks may require the use of specialized equipment. Tasks should be performed in simulated reality so as not to prejudice the actual client of a given company the learner is educating himself/herself. The employer should carefully analyze which activities that the learner can do at home and equip him/her with appropriate tools before starting education in the hybrid form.

In order for the learner to develop new skills, learners 'physically' learning in the company should have constant access to the educator, and their activities must be corrected on an ongoing basis. In a hybrid form, when a learner joins online, they should have their workstation ready before the lesson begins. The instructor conducts a demonstration, shows how to perform individual activities, and the learners perform them under the supervision of the instructor. A learner who is on-line and his/her educator must be in constant contact, which can be provided by instant messenger

(e.g. Zoom®, Microsoft Teams®). This means that the learner must be equipped with a camera and a microphone. The camera should be mobile so that the educator has a current view of what the learner is doing.

An appropriate view of job positions in the company is also very important. In the workplace where the tasks are performed, cameras should be placed in such a way that the learner can see the available space (example of the view of the production hall in Figure 10).
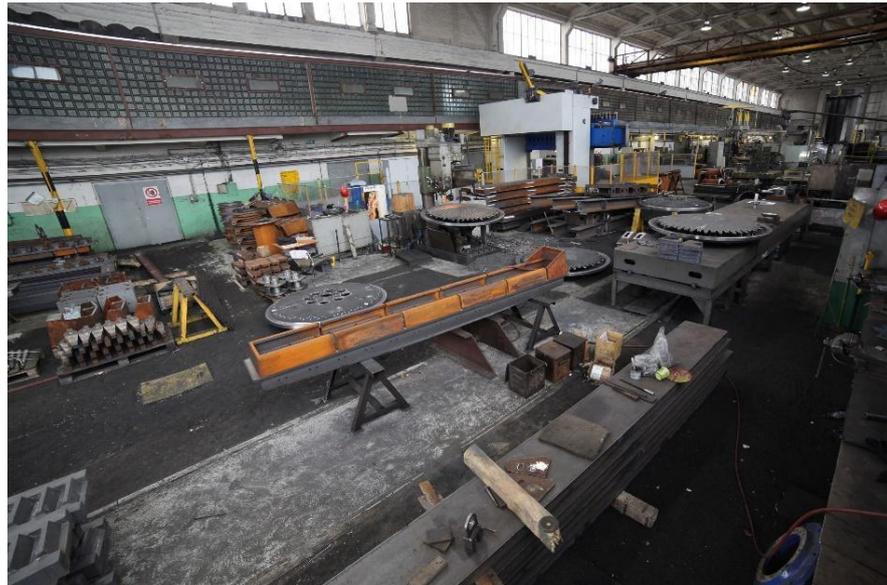


Figure 10. An example of a view in a production hall in a company that runs VET education (Credits:  http://zkrem.pl/)

The learner should be able to see from which stations tools, work materials and additional elements necessary to complete the task are taken. An additional camera should be aimed directly at the person performing the task (Figure 11).



Figure 11. An example of a camera view (Credits: https://www.oferteo.pl/)

The perfect situation is one in which the instructor is equipped with a mobile camera and records his/her activities in real time.

The guarantee of the effectiveness of vocational education organized in this way is good communication between the educator and the learner joining the on-line lessons.

*The role of the employer in VET hybrid education in professions in which direct supervision of the instructor is required*

In industries and professions where continuous instructor supervision is required for safety reasons, it may not be possible to perform some practical tasks in hybrid education. A learner joining an online lesson will only be able to observe the work of the instructor and other learners who are learning face-to-face during such a lesson. The hybrid learner should be provided with the possibility of communicating via instant messenger and recording the workplace.

*Protecting trade secrets in hybrid education*

Some of the activities of each company are under trade secrets. In particular, companies protect production processes, hall equipment or the unique way of performing individual activities. This information is confidential and may not be disclosed to third parties not related to the company. The decision regarding which information will be disclosed to individual employees lies with the company's leaders, such as the management board and the director. In determining the disclosure of information, learners cannot be omitted. Hybrid education, with recording, Internet access, and the use of instant messengers, is conducive to information leaks. Therefore, before starting hybrid education, both instructors and learners should undergo a thorough training during which they will learn how to protect trade secrets. Maintaining confidentiality also applies to family members of learners who may partially see the hybrid lesson. Companies should also ensure a secure Internet connection.

**Sum-up**

The role of companies in VET, regardless of the form of education, is indisputable. Without the participation of companies, the preparation of learners to enter the labour market would not be at such a high level as it is today. Vocational training with an employer in a hybrid form is possible after appropriate preparation of instructors and learners. Identifying content that can be delivered in a hybrid form and providing learners and instructors with the right equipment is a guarantee of success.
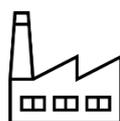
The possibility of introducing hybrid VET teaching at the employer's premises varies depending on the specific profession in which the learner is being trained. In certain occupations that involve specialised equipment or constant supervision by an instructor, implementing hybrid VET teaching may not be feasible. However, it remains crucial for

schools to support employers in adopting hybrid VET education, sharing their experiences, and assisting in organizing and managing the learning process.

## 5 Competency profile of the VET hybrid educator

**Start-up**

The success of vocational hybrid education depends mainly on the competencies of the educator who conducts such lessons. In this section you are going to find the competency profile of the VET hybrid educator.

**Competency profile**

*What are competencies?*

The concept of competency is often found in the literature dealing with issues in the field of the sociology of organizations, philosophy, law, and management psychology. The interdisciplinarity of this concept creates definition difficulties, and additionally, numerous synonymous terms such as skills, abilities, talents, potential, qualifications make it difficult to provide a universal definition of the concept of competency (Rakowska & Sitko-Lutek, 2000; Antczak, 2008). The concept of key competencies has become common, referring to the most important competencies in the implementation of tasks for the organization, job position, employee (Oleksyn, 2010). In the document of the European Parliament and the EU Council, key competencies are defined as a combination of knowledge, skills and attitudes appropriate to the situation, serving self-realization and personal development, social integration and employment, as well as being an active citizen (Recommendation…, 2006). The European Union recommends that Member States develop eight key competencies as part of a lifelong learning strategy.

*What are the main components of competencies?*

Rakowska and Sitko-Lutek (2000), based on a review of the literature, define competencies as a concept broader than skills. The level of competency depends on knowledge, personality traits, personal abilities, qualifications and experience, the ability to use them, attitudes, and motivation. Walkowiak (2007), in turn, lists the following components of competency: knowledge, skills, attitudes, personality traits, experience and behavior. Musioł-Urbańczyk (2010) analyzed the definitions of competency by various authors. The most frequently repeated components of competency are: knowledge, skills, attitudes, personality traits and experience. Knowledge and skills were present in 94% of the analyzed definitions, attitudes in 47%, personality traits and experience in 29%, motives and behavior in 18%, and abilities in 12% of definitions (Musioł-Urbańczyk, 2010).

Boyatzis (1982) defines competencies as the potential existing in a person leading to such behavior that contributes to meeting the requirements at

a given position within the organization's environment, which in turn brings the desired results.

The behavioral competency model emphasizes employee behavior. A competent employee is one who knows how to behave in order to achieve the set goal (knowledge), is able to take appropriate actions (skill) and wants to behave in a certain way (motivation) (Armstrong, 2007; Jurek, 2008). According to the behavioural model of competency, behaviour is the result of the possessed competencies. Such an approach to competency focuses on behaviour, attitudes and abilities of individuals who achieve high efficiency at work (Rankin, 2001). The pioneering concept of competency by McClelland (1973) emphasises the importance of criteria related to the performance of specific tasks. McClelland found that in the diagnosis of competencies, it is much more valuable to analyse behaviours that distinguish people who achieve the best results in specific types of work (Adams, 1997).

Oleksyn (2006) lists the following elements of competency: internal motivation, talents and predispositions, knowledge, experience and practical skills, health and fitness, other psychophysical features, attitudes and behaviours, formal authorization to act.

Thus, knowledge, ability and motivation to behave in a certain way are the key determinants of competencies. Competencies understood in this way are subject to the learning process, and the pace of their change over time depends on the environment and permanent dispositions (personality, intelligence).

*How do we understand the VET hybrid educator competencies?*

**The definition of the competencies of VET hybrid educator is as follow:**

> *a set of observable characteristics: knowledge, skills, attitudes and abilities, personality traits that enable the educator to effectively conduct VET hybrid education. Competencies understood in this way can be measured, developed and improved through the acquisition of experience, practice, training or other forms of development.*

*What is a competency profile?*

A competency profile is a detailed list and description of the characteristics and skills of an ideal employee - a set of key competencies essential for the effective performance of tasks at a given position.

**Eight key competencies**

The competency profile of VET hybrid educator presented below has been developed based on a literature review and the results of VET educators'

**of a VET hybrid educator**

and educators' research carried out at the beginning of the project hVET in five partner countries (Cyprus, Greece, Portugal, Poland, Turkey). In total, 110 VET educators participated in the surveys and 23 VET educators in the focus group interviews. This research was carried out in the academic year of 2022/23 (Figure 12).
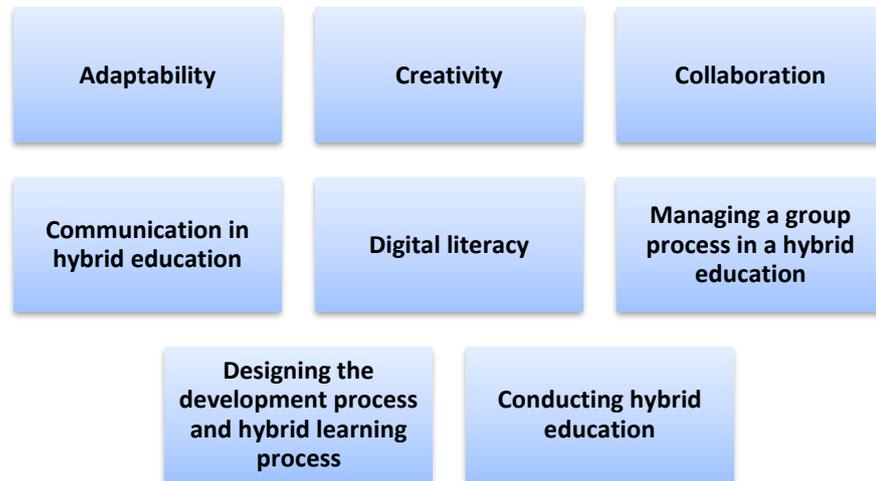
| Adaptability | Creativity | Collaboration |
|---|---|---|
| Communication in hybrid education | Digital literacy | Managing a group process in a hybrid education |
| Designing the development process and hybrid learning process | Conducting hybrid education | |

Figure 12. Competency profile of the VET hybrid educator (Credits: Authors).

These competences are understood as follows:

*Adaptability*

It is the ability to effectively adapt to changing educational conditions and adjust to meet the educational goal, both for online and face-to-face learners (to make appropriate educational decisions, balance three elements: online and face-to-face education as well as individualization of learning). It is also the ability to manage change and respond adequately to it, including coping with difficulties and mental resilience. It also includes curiosity and openness to new ideas, willingness to implement innovative procedures, new methods and forms of teaching in order to be flexible and work effectively in the field of VET education. (cf. Dainty et al., 2005a, 2005b; Muzio et al., 2007; Erarslan, 2023; Da'as, 2019; Crary, 2019; Gastager et al., 2022).

*Creativity*

Ability to generate ideas, problem solutions, or insights that are novel and appropriate. Taking initiative and innovative actions in VET education. Ability to use a wide range of techniques to generate new and valuable ideas. It is also the ability to think critically and solve problems - ability to identify key components of the problem, to collect and analyse data in order to find a solution or solutions (cf. Runco, 2004; Calavia et al.,2021).

| | |
|---|---|
| *Collaboration* | Ability of working in cooperation with online and face to face students, the school leaderships and companies towards a common educational goal. Working together to reach a goal – putting talent, expertise and smarts to work (ability to work effectively and respectfully with diverse perspectives). Maintain effective lines of communication with the school leaderships and the companies is also an essential skill that the VET teacher must have to improve teaching, taking in account both the needs of VET learners and the companies where they are going to work (cf. Dainty et al., 2005a, 2005b; Muzio et al., 2007). |
| *Communication in hybrid education* | Comprises adequate written and verbal communication with online and face-to-face learners. It also involves listening skills and proper application of all available communication tools in hybrid education. Moreover, it involves understanding of communication differences, identifying factors which may become a barrier for educational success. Communicating is essential for clear passing assignments and providing instructions for both group of learners (cf. Bjekić et al.,2020; Etzold & Krüger, 2021). |
| *Digital literacy* | Pedagogical competence to use ICT tools in hybrid VET education; knowledge of modern technologies improving the teaching process. To be confident, critical and responsible use of, and engagement with, digital technologies for teaching. Know and creatively use distance communication online platforms, digital tools and apps to support teaching and learning in hybrid education (cf. Falloon, 2020; Potyrała & Tomczyk, 2021). |
| *Managing a group process in a hybrid education* | Effective shaping of the course of processes, phenomena, events, effects in a group of learners as well as the behaviour of learners online and face to face, so as to achieve the planned didactic goals. Being attentive to what is happening in the group (e.g. body language of learners online and face-to-face, their activity in class) and the ability to coordinate the work of the class team and the remote learning learner. Ability to guide and motivate trainees (cf. Tuckman, 1965; Thomas, 2009; Kozak, 2010). |
| *Designing the development process and hybrid education process* | The ability to design an educational process and a VET lesson plan adjusted to the specificity of hybrid education. Knowledge of forms and methods of hybrid education and the ability to adapt traditional methods to the specificity of hybrid education. Ability to define activities and build contents for both learner groups. Knowledge of techniques to make hybrid learning relevant to the goal (cf. Kozak & Łaguna, 2015; Żak & Matras, 2018). |

Effective implementation of the VET education lesson plan in a hybrid form. Ability of activating different teaching methods and techniques for both face-to-face as well as online learners at the same time. Ability to build cooperation and support communication between two groups of learners (cf. Kozak & Łaguna, 2015; Żak & Matras, 2018).

The next visual presents how specific VET educator competencies could be translated into effective teaching in a hybrid environment (Figure 13).
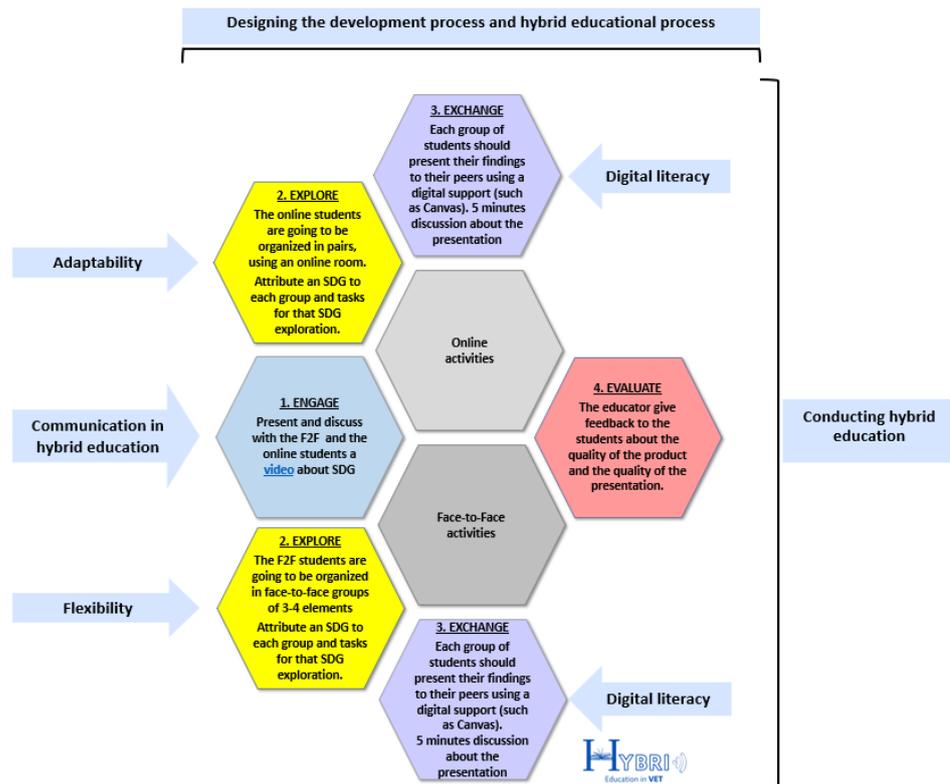
Figure 13. Example of competency profile mobilization of the VET hybrid educator (Credits: Authors).

In the previous example, designing the development process and hybrid education process competence is mobilize in the creation of the lesson plan and in the collection or creation of the resources needed for the in-person and online learners. Communicating in hybrid education competence is mainly mobilized in the Engage moment. Educator must mobilize its listening skills and proper application of all available communication tools in hybrid education, do dynamize the presentation and discussion of the SGD video. Flexibility is a competence mobilized mainly in the explore moment because the educator must manage simultaneously the in-person and the online learners, taking also care of their individual learning. Digital literacy competence is mobilized in many

teaching moments, but specially in the exchange moment because the VET educator must use its pedagogical competence to help students use ICT tools. Conducting hybrid education is mobilized in the full process, because the VET educator must effective implementation the lesson plan in a hybrid setting.

**Sum-up**

The VET hybrid educator competency profile includes cognitive competencies related to the educator's attitude and approach to education, interpersonal competencies related to establishing and maintaining contact with the learner, as well as technical and methodological competencies related to preparing and providing lessons with learners who are present in the classroom and online at the same time.

**TIP!**

If you want to measure the level of your VET hybrid educator competencies, you can complete the test on https://htc.oic.lublin.pl/

Completing the test and receiving feedback on the level of the eight above-mentioned competencies is free of charge.

# 6   Educators' role on VET hybrid education

**Start-up**

During the creation of hybrid education settings, educators should focus on identifying the most essential elements in education from basic education onwards, ensuring continuity and fluidity in the approach to various subjects and prioritising the learning progression of each learner without cuts or breaks between educational levels (UNESCO/IBE, 2021). One important educator role is the detailed selection, prioritisation and sequencing of key knowledge and competencies (UNESCO/IBE, 2021).

One main characteristic of an educator that uses hybrid education models is versatility. Versatile educators with the ability to combine different learning environments according to the needs of each learner (UNESCO/IBE, 2021). Another key point is mastering technologies to create spaces for the production, circulation, and dissemination of knowledge without borders or obstacles (UNESCO/IBE, 2021). In the following section, some tips for educators who are going to deliver hybrid education for VET learners are presented.

For the full development of the learner competences, in accordance with the guidelines issued in the *Future of Education and Skills: Education 2030* (OECD, 2018) in today's complex and challenging world, requires learners to cultivate lifelong learner agency (as an active agent) throughout life. The active involvement of learners in their development process implies a sense of responsibility in their engagement in the world and with others.

The concept of learner agency requires the ability to set goals and with them the actions necessary for their realisation. The educator needs to understand each learner as one learner as one and the context that surrounds them as a conditioner of learning. Thus, each educator assumes a collaborative and active role, evolving along the process of the students' learning. Moreover, the personal relation between learners and educators is essential to keep learners motivated and attend to their specific needs, in VET hybrid education.

In the next sections some hybrid education strategies and ideas are presented to the VET educator.

## 6.1 Create the VET hybrid course and set your learning goals

**Start-up**

Creating an online course requires time, effort, and ongoing commitment. The professional skills, knowledge and abilities that educators use to develop the curriculum give them a role of educator agency, facing challenges such as to handle increasingly large classes, teach in ways that help develop the knowledge and skills needed in today's society, develop teaching methods that are appropriate for an increasingly diverse learner body and deal with a variety of different modes of delivery (Ordu, 2021). The creation of the VET hybrid course in a Learning and Management System platform (LMS) and setting the learning goals are some of the initial tasks of your work as a VET educator.

In this section you are going to find some useful examples of how to do it!

**Organization of the course**

To organise the course, you should firstly define the main topics that are going to be addressed and the learning goals that you want learners to achieve. One idea is to organise the content in modules, on the LMS platform. Adding a visual with your course organisation, such as the one presented in Figure 14, could be very helpful to your learners having a global organisation of the modules.
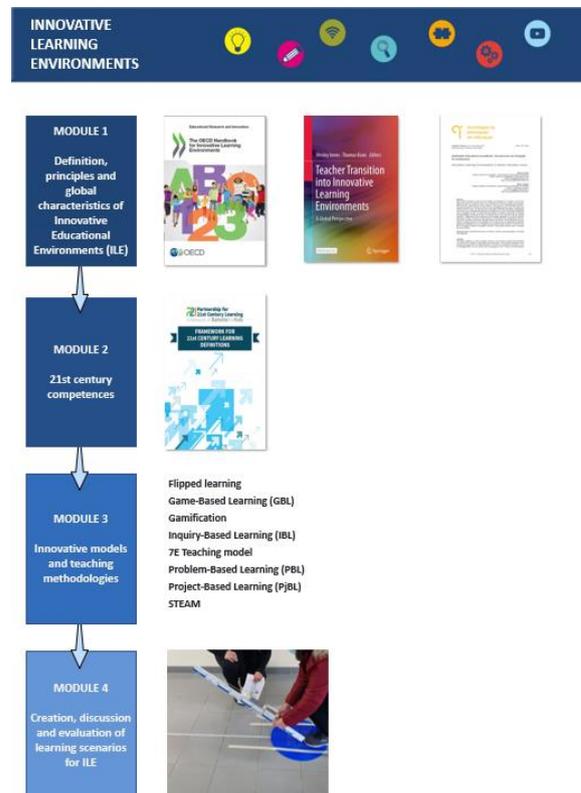


Figure 14. Module organisation of a course about Innovative Learning Environments (Credits: Authors).

The modules can be accessed both by online and in-person learners which is going to help you to manage the hybrid class. Then, break down the modules content into lessons to ensure a logical flow of learning.

*Learning goals*

Define clearly what are going to be the learning goals of the module. Determine what skills, knowledge, or outcomes you want your learners to achieve by the end of the course.

Through the setting of these goals, you can explain the key expectation to your learners.

F2F and online learners should be informed, at same time, which are the learning goals that are expected they accomplish at the end of the session or module.

*Learning Management System*

Select a Learning Management System (LMS) platform that best suits your needs for hosting and conduct your course.

Probably your institution already has a platform that you can use. However, if not, you can choose to use some popular platforms, such as Moodle®, Udemy®, Teachable®, Thinkific®, Google Classroom®, and Coursera®.

Consider factors such as ease of use and customization options. Remember that the tasks you are going to ask your learners to accomplish, must be performed online and in-person.

*Content creation*

Develop your course content, including videos, slides, written materials, quizzes, assignments, and any additional resources. Make sure the content is engaging, well-structured, and aligned with your learning goals. Take in consideration the learners' prior knowledge when creating content.

When adapting the material to the hybrid context, keeping in mind these questions could be helpful:

- What professional/vocational materials should the training contain?
- What part is based on practice?
- What part is based on theory?
- How can the task promote personal development?
- What can the learner do alone?
- What can the learner do in pairs/groups?
- Do the materials need to be taught by the educator?
- Does the content require in-person meetings?

Assign pre-work that learners should complete before the class, regardless of if they are online or physically attending the classes. This ensures they come prepared and maximises the effectiveness of hybrid interactions. Additionally, assign post-work to reinforce learning and provide opportunities for reflection.

*Adapt and change*

Be prepared to adapt and change your course based on learner feedback and changing industry trends.

**Sum-up**

Developing the VET hybrid course effectively and presenting clear learning goals is crucial for the course' success and essential for ensuring a structured and effective educational experience.

**TIP!**

Before launching your course to the public, invite a small group of beta testers to go through the course and provide feedback.

Use their input to improve the content, address any issues, and ensure a seamless learning experience.

## 6.2 Organize your hybrid learning space

**Start-up**

Having a proper learning space for hybrid education is essential for you to use this educational methodology.

At this section you are going to find some useful examples of how to do it, focused on the physical space and equipment!

**Physical space**

Keep in mind is that the space utilized in vocational education influences the types of tasks that can be carried out. Therefore, you should organise your **physical space** (chairs and tables disposition, technological equipment, and other materials) previously to your hybrid class. The next visuals present suggestions for different settings (Figure 15; Figure 16).



**1** | Smartboard that can be used for presenting information and for in-person learners to watch their colleagues online.

**2** | Laptop used by the educator with a camera pointed toward him/her. The laptop can be turned over to the learners, so that the online learners can see their in-person learners.

**3** | Additional projection equipment that can be used when needed.

**4** | Educator' space.

**5** | Chairs with writing support that can be used by the in-person learners.

Figure 15. Example of a physical space setting for VET hybrid education: CreativeLab_Sci&Math space of PISantarém (Credits: Authors).

**1** | Educator' space.

**2** | Sound equipment.

**3** | Laptop used by the educator with a camera pointed toward him/her.

**4** | Projection equipment.

**5** | Camera with tripod, that can be easily oriented.

**6** | Tables and chairs that can be used by the in-person learners.

Figure 16. Example of a physical space setting for VET hybrid education: ITE Lab space of PISantarém (Credits: Authors).

You should be aware that the quality of the course in terms of video and audio must be good for keeping the learner engaged and reduce attrition (Gamage *et al*., 2022), independently of the space setting chosen to deliver hybrid education.

**Sum-up**

Organising the learning space in hybrid education is vital for creating an inclusive environment that fosters engagement, collaboration, effective communication, and seamless integration of in-person and remote learning experiences.

Choose a comfortable place in the Hybrid VET Classroom, so that both in-person and online learners can clearly see and hear you!
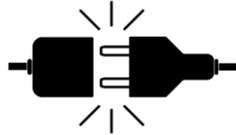
Be sure all equipment is properly connected to plugs and charged! You don't want that laptop to crash during your hybrid class!

### 6.3 Explain the tasks with detail to your learners

**Start-up**

Your in-person and online learners must be clearly informed of how they can navigate in your class. For that aim, visuals such as a chart, table or timeline with the tasks, goals and their chronological order is going to be very helpful.

**Suggestions for explaining tasks**

Organise with enough time the **learning management system** (LMS) in a way your online learners can easily find information and their tasks.

Explaining carefully to your learners what is expected from them during the hybrid classes is very valuable because they can easily situate themselves in the class dynamics. A well-organised visual can help you on that task (Figure 17)
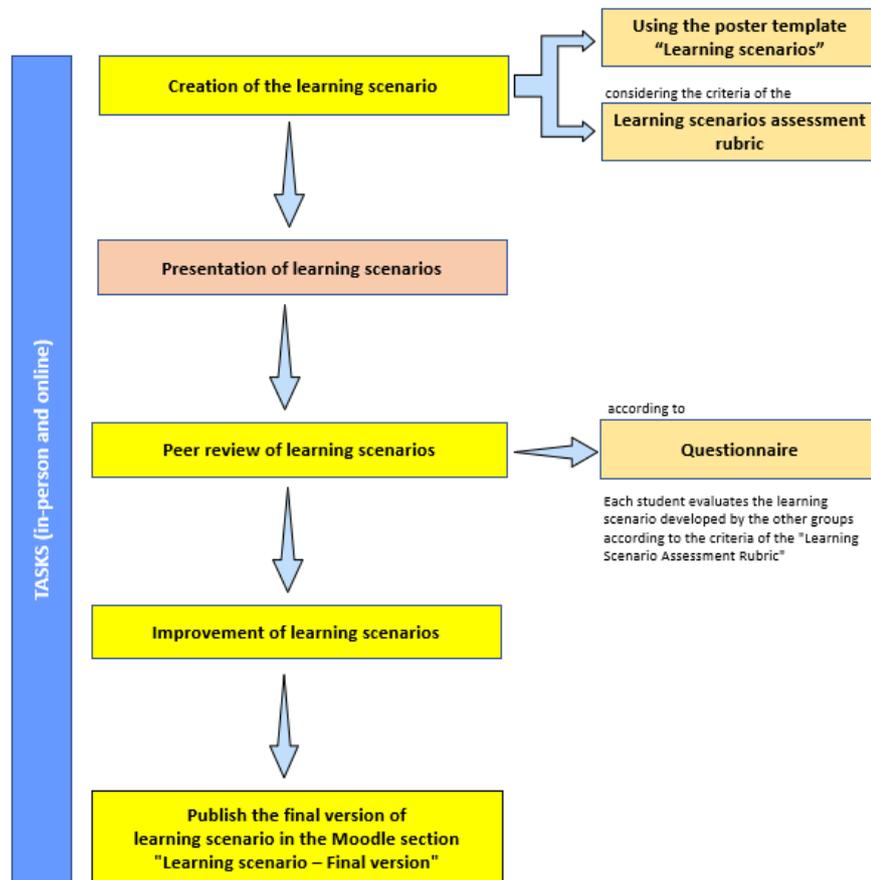
*Use visuals*



Figure 17. Example of a hypothetical visual for task presentation to a VET childcare course (Credits: Authors).

*Use clear and concise language*

When explaining tasks to VET learners, it's important to use language that is easy to understand. Avoid jargon or complex terminology unless necessary and focus on using clear and concise language to convey your

message effectively. In the next example, a creation of a learning scenario is suggested to VET learners that are coursing a VET childcare course.

**Example**: Please create a learning scenario of a hands-on activity for kindergarden kids about how to save water.

*Provide step-by-step instructions*

Break down the task into smaller, manageable steps. This approach helps learners understand the sequence of actions required to complete the task. Use bullet points or numbering to highlight each step clearly.

**Example**:

- Create an introduction about water saving.
- Create a discussion moment after the introduction, where the kindergarten learners can express their opinion.
- Carefully describe the hands-on activity about saving water.
- Create a conclusion moment after the hands-on activity.  after the introduction.

*Demonstrate the tasks*

Text or visual demonstrations can be highly effective in helping learners understand and remember tasks.

**Example**:

1. Introduction:
   - Gather the children in a circle and begin showing them pictures or illustrations related to water, such as rivers, oceans and life on water.
2. Discussion:
   - Discuss with them the importance of water and why it is essential to save it. Ask questions to engage them, such as "What do we use water for?" and "Why is it important to save water?"
   - Discuss simple actions they can take to save water at home, school, and in their daily routines (such as bath).
3. Hands-on activity:
   - Set up a large transparent basin or container filled with water in the center of the room. Mark the initial water line on the basin with a marker.
   - Ask kids to make a line.
   - Give each child an empty bottle or cup.
   - Instruct them to take turns pouring water from the large container into their own bottles or cups, as if it were a faucet running.  – It is expected that they waste water on the floor!

- Afterward, each child should empty the water back into the basin. Mark the final water line on the basin with a marker.
- Encourage them to see how much water it was wasted, emphasizing that we need to use water wisely and not waste it.
4. Conclusion:
   - Have the children gather together again, as a group.
   - Ask a few volunteers to share their thoughts about the activity and water-saving.
   - Ask them to create a drawing about water saving in their homes and daily routines.

| | |
|---|---|
| *Provide rationale and context* | Explain the purpose behind the task and how it fits into the overall children's education process. Understanding the rationale helps learners connect the task to the broader picture and encourages them to think critically. |
| *Provide hands-on demonstrations* | Perform live demonstrations of the task, allowing learners to observe the steps and techniques first-hand. Explain each action, highlight important details, and demonstrate proper handling of tools and equipment. Encourage learners to ask questions and clarify any uncertainties. |
| *Encourage questions and provide feedback* | Create an open and supportive learning environment where learners feel comfortable asking questions. Encourage them to seek clarification if something is unclear. Additionally, provide constructive feedback on their performance to help them improve their skills. |
| **Sum-up** | Providing detailed explanations of tasks to learners in hybrid education is crucial for promoting clarity, reducing confusion, ensuring equitable learning opportunities, and supporting learner success. |



To facilitate your work, remember that the **learning management system** can also be used by the in-person learners to read information and follow the tasks during the class time.

### 6.4 Identify the best strategies to manage in-person and online classes

**Start-up**

Being a hybrid education educator, you are going to have a difficult task: manage a in-person class and an online class simultaneously. In VET hybrid education, effective communication, and cooperation between all is crucial.

The next section presents some ideas to help you on this hard task.

**Strategies**

*Use frequently your LMS*

Use routinely the content of your course in the learning management system to share or present information both to your in-person and online learners.

*Give feedback to your learners*

Provide regular feedback to learners. Some will need continued feedback, but others prefer to work with more autonomy and will only request your feedback from time to time. Use the chat function of the online platform to send messages individually or collectively to your online learners.

*Have a break*

take a break for yourself and your learners. When you and your learners feel tired, give a 5 minute or ten-minute break to relax. A continuous and tiring work is not going to be productive to your performance and to your learners' learning.

*Learn with your mistakes*

Remember that currently there are not many educators experienced with hybrid education. Therefore, mistakes are going to be common. Learn with your mistakes, take notes, redesign, and improve your materials and your teaching sequence. Next class will be better!

*Share your experiences*

Share your experiences and problems with other colleagues that are also engaged in hybrid education. If you are able to create a learning community between hybrid education educators, this is going to be very helpful to all persons involved.

*Listen to your learners*

Ask your learners regularly how their learning is going and if you can improve something to promote their performance. Probably you are going to receive some valuable insights.

*Differentiate hybrid education*

Use the full amount possibilities provided by the F2F and online educational resources to individualize learning.

*Do not overload learners with assignments*

Do not overload your online learners with assignments. Sometimes educators give more assignments to online learners because they think

they have more time to accomplish them. However, this could not be the case. Try to give the same number of assignments to your F2F and online learners.

*Be prepared to deal with technical issues*

Have an IT close. Technical problems are going to be frequent. Arrange a form to easily contact the IT technician of your institution to solve any technical issue.

*Use strategies for the in-person and online learners collaborate with each other*

In hybrid education for VET, collaboration and interaction between in-person and online students are crucial. A successful hybrid course relies on the relationships established between in-person and online students. However, creating two separate learning groups, one with in-person students and the other with online students, can be challenging. At times, it may be preferable to create either online-only or in-person-only workgroups. Nevertheless, even in such cases, there should be opportunities for both in-person and online groups to engage in collective discussions and share information during classes.

For practical tasks in laboratories or with other types of materials, each in-person student group should include one or two online students and use a laptop, tablet, or smartphone for online students to participate and observe practical tasks.

To promote student collaboration, you can use the active learning strategies presented in Chapter 6.6 and the ICT resources presented in Chapter 7.2

## Microlearning

*Microlearning definition*

Microlearning is a program of small learning tasks, focused on very specific areas or ideas (Cheatle & Wilson, s.d.). Due to its characteristics, microlearning can be a more agile, flexible, affordable and manageable way to support employee development (Cheatle & Wilson, s.d.).

Watch this video to learn more about What is microlearning? (Riis, 2020).

*Benefits of microlearning*

Some benefits for learners are: microlearning fits into the daily flow of work; microlearning works with our natural learning process; microlearning presents information in easy-to-handle short bursts and fits well the way we consume information today; microlearning units are easier to share with colleagues (Cheatle & Wilson, s.d.). Next, some tips to help you prepare microlearning content are presented.

*Simplicity is crucial on microlearning*

In microlearning, avoid overloading the learner. Each micro asset should focus on bites of knowledge and just one central idea. Complex, substantive information is not the right fit for this learning approach (Cheatle & Wilson, s.d.).

| | |
|---|---|
| *Think visual* | An effective microlearning content is similar to great social media content – on-demand, engaging, and media-rich. Images, graphs, and infographics are often helpful to engage learners. Make sure that you have strong, consistent style and coherent guides between your microlearning units (Cheatle & Wilson, s.d.). |
| *Easy access to microlearning content* | To be valuable, microlearning content needs to be very easy to find. Make sure you're conscientious about categorising and describing your own content thoroughly, to make it effortless for users to find it in your LMS (Cheatle & Wilson, s.d.). |
| *Monitor, review and improve it over time* | Define a manageable process to review and update your microlearning content. For example, microlearning content about a particular software platform will need to be updated in line with new software versions (Cheatle & Wilson, s.d.). |
| **Sum-up** | Implement a combination of synchronous and asynchronous teaching strategies, leverage technology for seamless communication and content delivery, foster a sense of community, and prioritise flexibility and adaptability can be effective strategies to manage both in-person and online classes in hybrid education |

A short 2–3-minute video in which a specific question is approached is an effective way of conduct microlearning.

6.5 **Understanding the basics of gamification**

**Start-up**

Gamification, the strategic integration of game elements and mechanics into non-game contexts, has emerged as a captivating approach in education (Figure 18). It offers educators a powerful tool to enhance learner motivation, engagement, and learning outcomes. In this section, we will delve into the foundational concepts of gamification, exploring how game elements, such as points, badges, and challenges, can be skilfully employed to create immersive and dynamic learning experiences. By understanding the core principles of gamification, educators can harness its potential to revolutionize the traditional classroom setting and ignite learners' passion for learning.

**Gamification**

*"By grasping the underlying principles of gamification, educators can unleash its transformative power and foster a dynamic and enjoyable learning environment".*



Figure 18.  hVET project game: Hybrid mystery (Credits: Authors).

Gamification, an innovative approach that applies game elements to educational contexts, has garnered attention for its potential to revolutionize learner engagement and motivation in the learning process. In this section, we delve into the fundamentals of gamification, exploring how the incorporation of game mechanics can inspire enthusiasm and deepen understanding. By grasping the underlying principles of gamification, educators can unleash its transformative power and foster a dynamic and enjoyable learning environment.

*Define gamification*

Explain what gamification is and how it differs from traditional gaming. Discuss the purpose of using gamification in education and its impact on learner motivation and learning outcomes.

*Elements of gamification*

Explore various game elements, such as points, badges, leaderboards, and challenges, and how they can be integrated into educational activities to promote engagement and competition (Figure 19).

Figure 19. Points given in the hVET project game: Hybrid mystery (Credits: Authors).

*Gamification in different subjects*

Showcase examples of gamification in different subject areas, demonstrating how educators can apply game elements to various topics and learning objectives.

*Case studies*

Present real-world examples of successful gamification implementations in educational settings, highlighting the positive effects on learner participation and achievement.

**Sum-up**

Summarize the key concepts learned in this unit about gamification. Emphasize the potential benefits of using game elements in education and the importance of thoughtful design and alignment with learning goals for effective gamification.

**TIP!**

Keep in mind that gamification is not about turning education into a game, but rather harnessing game elements strategically to enhance learning. Focus on aligning game mechanics with learning objectives to create meaningful and purposeful gamified experiences.

### 6.6 Use active learning strategies focused on the learners

**Start-up**

Active learning strategies that directly engage learners have the potential to significantly enhance retention and motivation. Educators should implement techniques such as discussions, problem-solving, case studies, and group work, placing learners at the center of the learning process.

**Active learning strategies**

In the realm of hybrid education, where learners shift between online and in-person components, maintaining high levels of learner motivation and focus becomes a paramount challenge. To address this, educators should adopt active learning strategies that directly involve and engage learners. By placing learners at the core of their learning experience, and employing techniques such as discussions, problem-solving, case studies, and group work, educators can ignite learners' interest, enthusiasm, and commitment to persist in their learning journey.

*Active learning strategies focused on the learners*

In the active learning approaches, instead of being the primary source of information, the educator takes on the role of a facilitator or guide, supporting learners in their exploration and providing necessary resources and guidance (Figure 20). In this section, we will explore various active learning methods that can be applied in a hybrid context, promoting deeper understanding, retention, and fostering a dynamic and interactive educational environment.



| Think-Pair-Share | Small-Group Discussions | Flipped Learning |
| Problem-Based Learning | | Debates |
| Project-Based Learning | | Peer-teaching |

Figure 20. Examples of active learning approaches (Credits: Authors).

There are many active learning strategies that can be applied in a hybrid context:

- **Think-Pair-Share**: Learners think individually about a topic, then pair up to discuss their thoughts before sharing their ideas with the entire class. This approach encourages active participation and diverse perspectives.

- **Small Group Discussions**: Organizing learners into small groups to discuss a specific topic fosters collaborative learning and

encourages active engagement. Each group can report back the key points they discussed, promoting critical thinking.

- *Flipped-learning*: In a flipped learning model, learners access content online at home and then apply their knowledge through practical activities and discussions during in-person class time. This approach allows for more interactive and personalized learning experiences.

- *Problem/Project-Based Learning*: Engaging learners with real-world problems or projects challenges them to apply their knowledge and skills to practical situations. This approach nurtures problem-solving abilities and enhances critical thinking.

- *Debates*: Organizing debates on relevant topics allows learners to develop their argumentative and persuasive skills while considering different viewpoints. It encourages critical analysis and builds confidence in presenting ideas.

- *Peer-Teaching*: Allowing learners to create and deliver lessons with guidance from the educator promotes active learning. Peer teaching reinforces understanding while providing a sense of responsibility and leadership.

Next, some examples of active learning approaches are going to be detailed.

*Inquiry-Based Learning*

**Inquiry-Based Learning** (IBL) is an educational approach that focuses on learner-driven investigation and exploration of topics and questions. It is a learner-cantered and active learning method where learners actively engage in the process of discovering knowledge, rather than passively receiving information from educators. This approach is often employed in science and research-based subjects but can be adapted to various disciplines to enhance overall learning outcomes. IBL typically follows these principles:

**Questioning**: Learners are encouraged to ask questions about the world around them or a specific topic of study. These questions become the starting point for their learning journey.

**Investigation**: Learners are given the freedom to explore and research the answers to their questions. They may use various resources, conduct experiments, or engage in hands-on activities to find solutions.

**Collaboration**: IBL often involves group work and collaboration, where learners can share ideas, learn from one another, and work together to solve problems

**Critical thinking**: IBL fosters critical thinking skills as learners must analyze information, draw conclusions, and make connections between different pieces of knowledge.

**Reflection**: Throughout the IBL process, learners are encouraged to reflect on their findings and the learning experience, which helps them consolidate their understanding and consider further questions.

*Project-Based Learning*

**Project-Based Learning** (PjBL) is an educational approach that centres around learners completing an extended project that involves solving a real-world problem or addressing a complex question. It is a learner-centered method that encourages active learning, collaboration, critical thinking, and practical application of knowledge and skills.

The process of project-based learning generally involves several stages, such as project selection, planning, research, implementation, and evaluation. By engaging in a project from start to finish, learners gain a more profound understanding of the subject matter, develop problem-solving abilities, and acquire essential skills that are applicable in real-life contexts. PjBL is widely used in various educational settings and has proven to be an effective way to promote deeper learning and learner motivation. Key elements of PjBL include:

**Real-world relevance**: Projects are designed to have practical applications or connections to real-life situations, making the learning experience meaningful and engaging for learners.

**Inquiry and investigation**: Learners are encouraged to ask questions and explore various aspects of the project. This fosters curiosity and helps them develop a deeper understanding of the subject matter.

**Active engagement**: PjBL promotes active learning, as learners are actively involved in planning, researching, and creating solutions for the project.

**Collaboration**: Projects often require teamwork, allowing learners to work together, share ideas, and learn from each other's strengths and perspectives (Figure 21).

Figure 21. Project-based learning example (Credits: Pixabay)

**Critical thinking and problem-solving**: PjBL encourages learners to analyze information, think critically, and apply their knowledge and skills to develop innovative solutions to the project's challenges.

**Presentation and communication**: At the end of the project, learners typically present their findings or creations to their peers, educators, or even a broader audience. This helps improve communication skills and builds self-confidence.

*Flipped learning*

Flipped learning, also known as **flipped classroom**, is an educational strategy that reverses the traditional approach to teaching. In a flipped classroom, the typical sequence of content delivery and homework is flipped. Learners learn new material outside the classroom, usually through pre-recorded video lectures, online resources, or readings, and class time is used for active learning activities, discussion, and problem-solving.

Flipped classroom models leverage technology to deliver educational content outside of the traditional classroom setting, which has become more feasible with the availability of online resources and digital tools. By shifting the focus from passive content consumption in class to active learning and problem-solving, the flipped classroom approach aims to enhance learner learning outcomes and promote a more dynamic and interactive learning experience, which is suited for hybrid learning. Some key components of flipped learning are:

**Pre-class learning**: Learners are assigned to study the educational material before coming to class. This allows them to access the content at their own pace and review it as needed.

**In-class activities**: Class time is dedicated to interactive and hands-on activities that reinforce the concepts learned in the pre-class phase. This can include discussions, group work, problem-solving exercises, simulations, and practical applications of knowledge.

**Individualized learning**: Learners have the flexibility to progress through the pre-class materials based on their learning pace and preferences. This personalized approach can cater to different learning styles and abilities.

**Immediate feedback**: During in-class activities, learners can receive immediate feedback from the educator and peers, helping them clarify doubts and solidify their understanding.

| | |
|---|---|
| **Strategies to promote active learning** | Tharayil *et al*. (2018) presents some strategies that educators can apply to promote active learning: (a) explain the purpose, (b) explain course expectations, and (c) explain activity expectations. Facilitation strategies include the following: (a) approach non-participants, (b) assume an encouraging attitude, (c) grade on participation, (d) walk around the room, (e) invite questions, (f) develop a routine, (g) design activities for participation, and (h) use incremental steps (p.1). |
| **Sum-up** | Implementing active learning strategies that prioritize learners' active engagement can lead to improved retention, motivation, and critical thinking. By incorporating techniques like Think-Pair-Share, small group discussions, and real-world problem-solving, educators create dynamic and interactive learning environments that foster a deeper understanding of the subject matter. |
| **TIP!** | Do not always use the same active learning approach. By diversifying the approaches, you will promote the development of different skills in your learners. |

### 6.7 Use the ICT solutions best suited to your class

**Start-up**

Choosing the right information and communication technology (ICT) tools is crucial for an effective hybrid education model that blends in-person and online learning. With a wide array of solutions available, from video conferencing platforms to learning management systems to collaboration tools, it can be overwhelming to determine what is best suited to your particular context. Careful consideration should be given to the needs of your learners, their resources and skills, your pedagogical goals, availability of support and training, user-friendliness, and costs. Taking the time to properly evaluate and select solutions that are accessible, easy to use and tailored to the needs of your class will pay dividends in successful adoption and impact on learning. Periodic review of what's working and where there are gaps is also important. With a thoughtful selection process, you can create an ICT ecosystem that enhances the possibilities for interactive and self-directed learning across in-person and virtual channels.

The implementation of hybrid education assumes the use of ICT solutions that provide audio-video transmission from the classroom / workshop / place of providing vocational education lessons, in such a way that the VET educator and all learners can hear and see each other clearly.

In this section you are going to find some useful examples of those solutions. Integrating these ICT solutions in a hybrid classroom can foster a more interactive, flexible, and engaging learning environment, accommodating the needs of learners regardless of their physical presence in the classroom.

**ICT solutions**

Be aware that hybrid education is not about a simple audio-video transmission for online learners broadcast from the place where the lesson takes place. VET educator must teach remote and in-person learners at the same time using ICT tools. Such an approach requires a combination of traditional and online teaching methods, so that both groups of learners can develop their professional competences and fully benefit from the lessons.

*Key factors when selecting ICT tools*

There are several key factors to consider when selecting the right ICT tools and platforms for a hybrid learning context:

**Needs:** What kind of digital tools do you need to facilitate collaboration and communication between in-person and virtual learners? Think about synchronous video tools for virtual lectures, discussions and conferencing, learning management platforms for asynchronous document sharing and collaboration, and interactive apps or sites for assessments, simulations or

gamified learning. Select tools that will enable the kinds of educational approaches and interactions you aim to implement.

**Resources**: What devices, internet capabilities and digital proficiencies do your learners have access to? If learners have limited technology access or skills, simpler, low-bandwidth tools may be preferable to more complex, resource-intensive ones. Build equity of access into the technology selection process.

**Goals**: Will learners need to actively create and share content with peers, or will they primarily consume content individually? More interactive tools lend themselves better to constructivist approaches, while straightforward presentation tools may suffice for lecture-style delivery. Match tools to pedagogical goals.

**User-friendliness:** Look for platforms such as Moodle®, Google Classroom® or Canvas® that provide an intuitive central hub for the learner experience online. Tools that have a steep learning curve will hinder adoption. Favour user-friendly, familiar solutions.

**Support***:* Will there be adequate tech support resources to troubleshoot issues learners and educators encounter with new tools? More complex tools require more support.

**Training**: Does the solution come with training resources built in? Can the school provide training for educators and learners? Ease of access to help and training has a major impact on successful implementation. Favour solutions where support resources are available.

**Cost:** While not always definitive, cost and budget considerations can play a role. Free solutions like Google Apps or low-cost tools and platforms can help remove access barriers.

Evaluating these key factors carefully when selecting ICT solutions for hybrid learning will help set both educators and learners up for an effective blend of physical and virtual interactions. Be sure to pilot test tools with a sample of end users, get feedback, and be prepared to refine the technology mix. Ongoing assessment of what tools are working well and what gaps need to be addressed will help optimize the ICT environment over time.

*Create videos*

Being able to create digital resources, such as educational videos is a skill that a VET educator should master to allow a deep learning of the learners (Barbas *et al*., 2020). Tools like Screencast-O-Matic®, Camtasia®, or OBS Studio® enable educators to create pre-recorded video lessons, tutorials, and demonstrations. These can be shared with both in-person and remote learners to reinforce learning and provide flexible access to course content (Figure 22).

Figure 22. Creating videos is a good solution for hybrid education (Credits: [Pixabay](Pixabay))

*Use video repositories and online libraries*

Access to a repository of educational videos and online libraries, such as YouTube Education® or Khan Academy® can supplement classroom education and provide learners with additional learning resources. Of course, you can also create your own educational videos.

*Use Learning Management Systems*

Using Learning Management Systems (LMS) is a good idea to manage online and in-person classes at same time. An LMS is a digital platform that centralizes course materials, assignments, assessments, and communication between learners and educators. It allows instructors to organize content, track learner progress, and facilitate discussions in both in-person and virtual settings.

*Use virtual whiteboards*

Digital whiteboards allow educators to present and illustrate concepts during class, making it easier for both in-person and remote learners to follow along. These boards often offer collaborative features, allowing learners to contribute and interact with the content. Many video conference platforms, such as Zoom®, BigBlueBotton® or Microsoft Teams® have embedded white boards.

*Use online collaboration tools*

ICT solutions such as Google Workspace® and Microsoft 365® provide cloud-based productivity tools such as shared documents, spreadsheets, and presentation software. These tools enable learners to collaborate on projects, regardless of their physical location.

| | |
|---|---|
| *Use mobile learning apps* | Mobile applications designed for educational purposes can offer additional opportunities for learners to engage with course materials, complete quizzes, and access resources from anywhere. |
| *Use real-time polling and quizzing tools* | Real-Time Polling and Quizzing Tools enable educators to gauge learner understanding and gather feedback during live lectures or discussions. Poll Everywhere®, Kahoot!®, and Mentimeter® are examples of platforms that support real-time polling and quizzing. |
| *Use virtual reality or augmented reality tools* | Virtual Reality (VR) and Augmented Reality (AR) tools are immersive technologies that can provide interactive experiences, simulations, and visualizations that enhance learning in various subjects, bringing real-world scenarios into the classroom. |
| *Use parent-educator communication platforms* | To keep parents informed about their child's progress, behavior, and activities in a hybrid classroom, communication platforms like ClassDojo® or Remind® can facilitate regular updates and messages. |
| *Use online assessments and grading software* | Platforms such as Google Forms® or online quiz builders simplify the process of creating and grading assessments, making it easier for educators to manage evaluations for both in-person and remote learners |
| *Borrow equipment for learners use at their homes* | For example, Zeman & Lafata (2022) created a model of hybrid education in which the learners are not performing the laboratory tasks and their lessons in the laboratory (like in distant online mode), but contrary to the distant online education, all necessary equipment is borrowed (e.g. FPGA kits, AD/DA converters, etc.) for the learners being able to use it at their homes, college dormitories, etc. |
| **Sum-up** | Embracing ICT in hybrid education can help you to facilitate seamless communication, enhance collaboration, provide flexible learning opportunities, and promote personalized learning experiences for all learners. |



Communication is very important in VET hybrid education and must be bidirectional between learners and educators. Make sure that all learners are listening and seeing what happens in the hybrid environment and that they can also participate in the class.

### 6.8 Keep the learners motivated and focused

**Start-up**

Hybrid learning presents challenges for learner motivation and focus. To address this, educators should use active engagement strategies, intrinsic and extrinsic motivation, monitor online participation, provide support, and communicate clear expectations. This foster sustained motivation and focus during independent online periods. In fact, Gamage *et al*. (2022) have shown that both the cognitive and social presence of the instructor is important for the continued engagement of the learners with the online content. They suggest that interpersonal connection and guidance should be increased in the online courses.

In this section you are going to find some useful examples of how to keep your learners motivated and focused!

**Learners' motivation**

Maintaining learner motivation and focus in a hybrid learning setting requires a combination of well-designed, engaging activities, effective communication of expectations and goals, and continuous support and encouragement from educators. By employing these strategies, educators can help learners stay motivated, committed, and focused on their learning journey, even in the face of distractions in the digital environment (Figure 23).



Figure 23. Educator has an important role in keeping students' motivation and focus (Credits: Authors).

*Set clear expectations*

You should clearly communicate the goals, objectives, and expectations for the hybrid classes. Learners should know what is expected of them in terms of attendance, participation, assignments, and deadlines. Use short sentences to communicate the lesson' goals. Using notes on a table, such as the following, could help you in the presentation of this information for your VET learners in a structured way.

Table 1. Example of attendance, participation, assignments, and deadlines for a VET course.

| Attendance | Participation | Online assignments | In-person assignments | Deadlines |
|---|---|---|---|---|
| ● At least 80% of the hybrid classes | ● Online: At least one post on forums for each work<br>● In-person: At least to oral presentations of work | ● 5 Quizzes<br>● 10 Answers on forum<br>● 1 video presentation<br>● 1 VET project | ● VET project products<br>● 1 project oral presentation with discussion<br>● | ● The deadlines of the online assignments are going to be presented each week<br>● The VET project must be concluded two weeks before the end of the course<br>● The project oraç presentation is going to occur in the last week of the course |

*Create a structured schedule*

Establish a consistent schedule for the hybrid classes, including both online and in-person components (Figure 24). This will help learners plan their time effectively and stay on track.
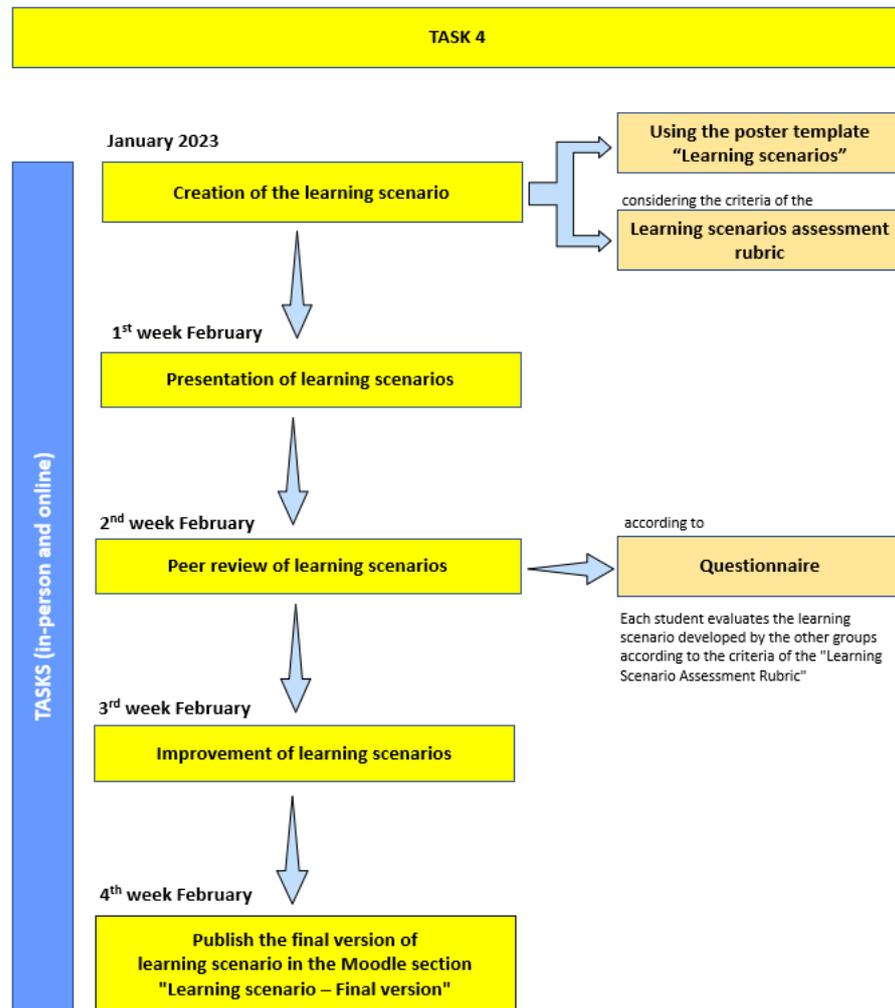
Figure 24. Example of a structured schedule of the task 4 of a course (Credits: Authors).

*Use interactive and hands-on activities*

Incorporate interactive and hands-on activities that simulate real-world vocational experiences. This could include virtual simulations, practical exercises, case studies, group projects, or industry-related assignments. Engaging activities can enhance motivation and keep learners focused.

See an example of interactive activities that simulate real-world vocational experiences in the document Situation-based VET using virtual reality (UNESCO/UNEVOC, s.d.)

*Provide regular feedback*

Offer timely and constructive feedback on VET learners' performance and progress, in-person or using online tools. Recognize their achievements and provide suggestions for improvement. Feedback can boost motivation and help VET learners stay engaged in the learning process.

| | |
|---|---|
| *Celebrate achievements* | Acknowledge and celebrate the achievements and successes of your vocational learners. This could be through virtual awards ceremonies, recognition on social media platforms, or showcasing their work. Celebrating achievements promotes a positive learning environment and motivates learners to excel. |
| *Foster a collaborative learning environment* | Encourage learners to collaborate and interact with their peers, both online and in-person. This can be achieved through group discussions, virtual forums, team projects, or study groups. Collaborative learning fosters engagement and helps learners stay motivated. |
| *Use technology effectively* | Make the most of technology tools and platforms that facilitate hybrid learning. This could include video conferencing for virtual lectures, online discussion boards, multimedia presentations, or interactive educational apps. Technology can enhance VET learners' engagement and make the learning experience more enjoyable. |
| *Personalize education* | Recognize that each VET learner has unique strengths, weaknesses, and interests. Tailor education to accommodate different learning styles and provide opportunities for each VET learner pursue their individual vocational interests. Personalization can increase motivation and focus. |
| *Encourage self-reflection and goal-setting* | Encourage VET learners to reflect on their learning progress and set personal goals for improvement. Regularly check in with VET learners to discuss their goals, offer guidance, and track their progress. Self-reflection and goal-setting promote a sense of ownership and drive to succeed. |
| *Structured online components* | Keep online learning components organized and structured. Provide clear instructions and expectations, avoiding overwhelming learners with excessive information. |
| *Monitoring and participation* | Utilize tools to monitor online participation and attendance. Encourage regular interaction through questions, polls, and discussions to ensure active engagement. |
| *Availability and support* | Be available to address learners' questions and concerns during online periods. Offering virtual support helps learners feel supported and connected. |
| **Sum-up** | Fostering learner motivation and focusing on hybrid education could be achieved by leveraging active learning strategies, creating a sense of community, providing regular feedback, and promoting self-directed learning. |

Remember that keeping vocational learners motivated and focused is an ongoing process. Stay adaptable and open to feedback, and continuously seek ways to make the hybrid learning experience more engaging and relevant to their vocational aspirations.

## 6.9 Promote inclusion of all learners

**Start-up**

In the context of hybrid education, ensuring the inclusion of all learners becomes a paramount priority. Embracing diversity and catering to the unique needs of each learner is crucial for creating an enriching and supportive educational experience. In this section, we will explore essential strategies to promote inclusion in hybrid learning environments. By offering multiple engagement options, providing individualized support, encouraging collaboration, and adopting inclusive practices, educators can create an inclusive and empowering atmosphere where every learner can thrive and reach their full potential

**Inclusion of all learners**

By implementing these ideas, educators can create a more inclusive hybrid classroom that caters to the diverse needs and abilities of all learners, fostering a positive and enriching educational experience for everyone.

Learn strategies about inclusivity in the classroom created by the [Center for Teaching Excellence](#).

*Multiple engagement options*

Offer various ways for learners to engage with content, such as providing videos, audio materials, and text-based resources. This approach allows learners to choose the format that best suits their learning style and preferences.

*Accessibility and accommodations*

Provide written cues and outlines for video materials, use captions in videos, and allow flexibility in assignment formats and timing. Consider individualized accommodations to support learners with different learning challenges or disabilities.

*Individual assistance and feedback*

Offer personalized assistance to learners who may require extra support. Providing individual feedback on their progress and performance can be immensely beneficial in helping learners feel valued and encouraged.

*Tech skills and support*

Assess learners' technology skills at the beginning of the course and provide support materials and resources for those who may need help navigating the digital tools.

*Inclusive language and respect*

Use language that is inclusive and respectful of all learners, considering their identities, and cultural backgrounds. Demonstrate sensitivity to diversity.

| | |
|---|---|
| *Accessible course materials* | Provide course materials in multiple formats, such as text, audio, and video, to accommodate different learning preferences and abilities. Ensure that all materials are accessible to learners with disabilities, including providing closed captions for videos and alternative text for images. |
| *Clear communication* | Maintain open and clear communication with all learners, both in-person and remote. Use various channels, such as email, messaging apps, and video conferencing tools, to ensure that all learners receive important announcements, updates, and clarifications. |
| *Use the Universal Design for Learning* | Implement UDL principles when designing lessons and activities. UDL encourages using varied teaching methods, offering multiple means of representation, engagement, and expression to cater to diverse learning styles and abilities. |
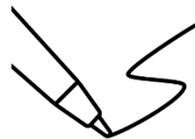
Learn more about the Universal Design for Learning in the UDL Guidelines.

| | |
|---|---|
| *The assessments should be flexible* | Offer a range of assessment methods that allow learners to demonstrate their understanding in different ways. This can include written assignments, presentations, projects, and online quizzes. Be willing to consider alternative assessment formats if needed. |
| *Encourage collaboration* | Foster a collaborative and inclusive classroom environment by promoting group work and team activities. Utilize online collaboration tools and platforms that facilitate communication and cooperation among learners, regardless of their physical location (Figure 25). |
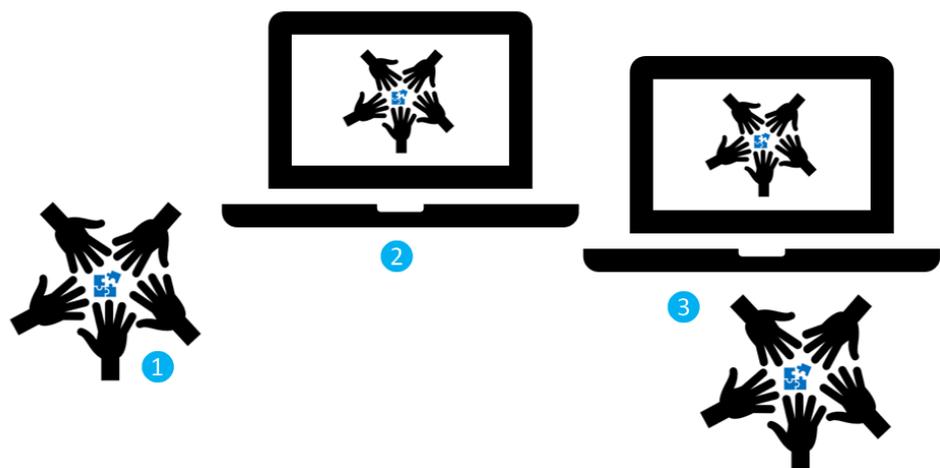
Figure 25. Doing group work in-person (1), online (2) or in hybrid groups (3) is a good strategy to foster collaboration (Credits: Authors)

Encourage peer interaction and support by assigning group projects or pairing up in-person and remote learners for specific tasks. This promotes a sense of community and helps build relationships among learners.

*Maintain an easy contact with learners*

Offer regular virtual office hours to provide individual support and address any concerns or questions that learners may have. Ensure that remote learners have equal opportunities to connect with educators and seek assistance.

*Mindful scheduling*

Consider the scheduling of in-person and online activities to accommodate the needs of all learners. Be mindful of time routines for remote learners with special needs and avoid scheduling crucial activities during times that might be challenging for them to attend.

*Emphasize empathy*

Foster a culture of empathy and sensitivity towards all learners, acknowledging that each learner has unique circumstances and challenges. Encourage learners to share their experiences and perspectives, creating an inclusive and respectful classroom environment.

*Provide regular feedback and opportunities for reflection*

Seek feedback from learners about their experiences in the hybrid classroom and adjust based on their input. Reflect on the effectiveness of inclusive strategies and continuously improve the learning environment.

**Sum-up**

By employing this balanced approach to inclusion, educators can create a supportive and inclusive learning environment that embraces the diverse needs and abilities of all learners, fostering, at the same time, engagement, participation, and academic success for every learner.

The needs of learners are very diverse, and it is normal that you do not know how to handle all situations. Ask help from a colleague or a school psychologist when needed.

### 6.10   Set how the learners are going to be assessed

**Start-up**

Assessments play a crucial role in the learning process, guiding both learners and educators in evaluating progress and understanding. In a hybrid learning environment, it is essential to establish a clear and well-thought-out assessment plan that aligns with learning objectives and curriculum standards. Therefore, it is important at the beginning of the hybrid classes to inform your learners how they are going to be assessed and receive feedback of their work.

**Assessment**

Diversifying your assessment strategies and instruments is very important in hybrid education. By employing a balanced approach to assessment in hybrid education, you can gain a comprehensive understanding of each learner' progress while offering timely feedback and support to enhance their learning experience.

Consult the strategies to prepare learners to assessment proposed by Tennant (s.d.).

Basically, there are three assessment strategies that you can use on hybrid education.

*Assessment strategies*

| Diagnostic* | Formative* | Summative* |
|---|---|---|
| Used to identify current knowledge and misconceptions about a topic at the beginning of the hybrid educational process. | Used to provide feedback during the hybrid educational process. | Used to sum-up learning at the end of the hybrid educational process. |

*Assessment instrument examples*

| | | |
|---|---|---|
| ● Pre and post-tests | ● Learner observations | ● Tests |
| ● Self-assessments | ● Homework | ● Multiple choics |
| ● Interviews | ● Reflections journals | ● Checklists |
| ● Observations | ● Discussions | ● Final version of portfolios |
| ● Polling | ● Learners/educator conferences | ● Interviews |
| ● Quizzes | ● Peer reviews | ● Rubrics |
| (Adapted from | | ● Essays |

- Informal presentations
- Portfolios on-going
- Project phases submitted over time
- Visual thinking strategies

- End of project products

\* Adapted from the assessment selection tool of the Institute for Arts Integration and STEAM

| | |
|---|---|
| *In-person vs. online assessments* | Differentiate between in-person and online assessment methods based on the nature of the tasks. Consider using oral exams, presentations, or hands-on projects for in-person components, while utilizing automated quizzes, written assignments, and multimedia projects for online evaluation. |
| *Engage learners actively* | Encourage active participation in formative assessments. For example, use live polls during video lectures or in-person discussions to gauge learner understanding and stimulate engagement. |
| *Real time feedback* | Leverage technology to provide real-time feedback on formative assessments. Online quizzes and interactive tools allow you to see how learners are performing immediately, allowing you to address misconceptions promptly. |
| *Equal opportunities of assessment* | Ensure that both in-person and remote learners have access to the same assessment opportunities. Online quizzes, video presentations, and written assignments can be easily used for both groups. Consider providing different modalities for assessment to accommodate various assessment preferences. |
| *Diverse assessment formats* | Employ a variety of assessment formats, such as essays, portfolios, multiple-choice questions, presentations, and discussions. This mobilizes different skills and allows learners to demonstrate their understanding and skills effectively (Figure 26). |
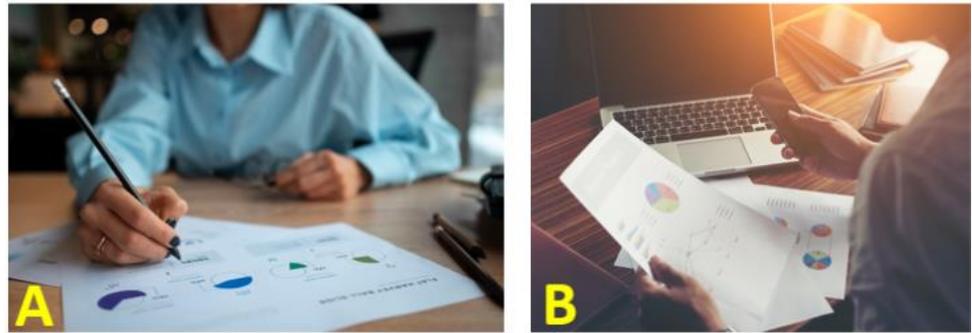
Figure 26. Varying the assessments formats, using classical pencil tests (B) or assessments that mobilize the use of digital technologies (B) can help learners to mobilize different skills (Credits: Adapted from Freepik)

| | |
|---|---|
| *Strategic timing* | Schedule assessments at spaced intervals, aligning them with the pace at which concepts are covered in the course. Setting appropriate deadlines for tasks ensures a balanced workload for learners. |
| *Weight distribution of assessment* | Balance the weight of in-person and online components in the overall course grade. Fairly assigning value to different assessment types reflects their importance in achieving the learning objectives. |
| *Security measures* | Employ technology tools and protocols to prevent cheating and maintain the integrity of online assessments. Consider proctoring solutions or other anti-cheating mechanisms if needed. |
| *Accommodations for individual needs* | Establish accommodations for learners with specific needs, such as providing extra time for exams or offering oral assessments for those who may require it. |
| *Use rubrics* | For summative assessments, provide clear rubrics outlining the criteria for success Using rubrics to assess your learners and to explain to them how they are going to be assessed could be very helpful (See Table 2). This helps learners understand what is expected of them and provides transparency in the grading process. |

*Self-assessment and reflection*

Encourage learners to engage in self-assessment and reflection on their learning progress. Providing guidance and feedback on their self-assessment helps them identify areas for improvement. Use self-assessment cards to promote students' reflection on their learning (Figure 27).



Figure 27. Example of a self-assessment card (Credits: Authors).

*Reflect and adjust*

Regularly review the assessment results and reflect on your teaching strategies. If you notice patterns of misunderstanding or areas where learners are struggling, adjust your educational approach accordingly (Figure 28).

Figure 28. Do a regular monitoring of the learners' results and adjust your hybrid education strategies accordingly (Credits: Adapted from Freepik)

**Sum-up**

Designing a comprehensive assessment strategy in the hybrid model involves a thoughtful approach that balances assessment types, accommodates individual needs, and aligns with the course objectives. Clear communication of assessment expectations and providing opportunities for self-reflection empowers learners to take ownership of their learning journey.

**TIP!**
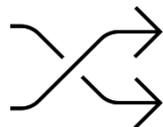
Mix the strategies and the instruments used in the assessment of your learners. You can gain a comprehensive understanding of each learner's progress while offering timely feedback and support to enhance their learning experience.

Table 2.  Rubric example: Rubric for evaluation of learning scenarios (Adapted from Correia & Cavadas, 2022).

| Categories | Level (1) | Level (2) | Level (3) | Level (4) |
|---|---|---|---|---|
| **Goals** | ☐ The objectives are not well defined nor are they suitable for the target audience. | ☐ The objectives are clearly defined, but do not suit the target audience. | ☐ The objectives are clearly defined and are suitable for the target audience. However, the volume of work may make the proposal unworkable. | ☐ The objectives are clearly defined, are suitable for the target audience and achievable. |
| **Active approaches** | ☐ Active approaches were not indicated, but only approaches typical of traditional educational environments. | ☐ Active approaches were indicated, but the approaches do not fit the pedagogical dynamics of the learning scenario. | ☐ Active approaches were indicated. The approaches are adapted to the pedagogical dynamics of the learning scenario. | ☐ Active approaches were indicated. The approaches were grounded and adapted to the objectives and pedagogical dynamics of the learning scenario. |
| **Learning environments** | ☐ No work areas adapted to the performance of the different tasks proposed in the activity were indicated. | ☐ Some areas of work adapted to the performance of the different tasks proposed in the activity were indicated. OR Not all areas were thoroughly explained; they were only briefly mentioned in a general manner. | ☐ Some work areas adapted to the performance of the different tasks proposed in the activity were indicated. These areas were sometimes related to the twenty-first century skills to be developed. | ☐ All tasks were associated with specific work areas to be developed. The twenty-first century competencies to be developed in these areas were indicated, in accordance with the objectives of the proposed tasks. |
| **Digital technologies and other resources** | ☐ Digital technologies and other features were not included in the proposal. | ☐ Digital technologies and other features have been included in the proposal, but they are not the most appropriate. | ☐ Digital technologies and other resources are appropriate and conform to learning objectives, but not easily accessible (require authentication, etc.). | ☐ Digital technologies and other resources are appropriate, easily accessible and in line with learning objectives. |
| **Learning activities** | ☐ The activities included in the learning scenario are adapted from other activities made available during this discipline. The sequence of learning activities is not well articulated and does not present a complete description. In particular it does not distinguish the moments of collaborative and individual work, nor the roles of the educator and the learner. | ☐ An original activity included in the scenario relates to real problems but is not the most appropriate to the content and age level of the learners.  The sequence of learning activities is not well articulated and does not present a complete description. In particular, it does not distinguish between moments of collaborative and individual work. | ☐ At least one of the activities included in the scenario relates to real problems and conforms to the objectives and age level of the learners.  The sequence of learning activities is not well articulated or does not present a complete description. | ☐ At least one of the activities included in the scenario is interdisciplinary, relates to real problems and conforms to the objectives and age level of the learners.  The sequence of learning activities is well articulated and presents a complete description. |
| **Assessment** | ☐ The scenario does not present learning assessment strategies, ways for learners to evaluate activities or self-evaluate their learning. | ☐ The scenario presents only one form of assessment and learners are not given the opportunity to evaluate the activities or self-evaluate their learning. | ☐ The scenario presents some forms of evaluation, but learners are not given the opportunity to evaluate the activities or self-evaluate their learning. | ☐ The scenario clearly shows that learners are provided with feedback on their performance. Learners are also given the opportunity to give their opinion and self-assess their learning. |
| **Scenario design** | ☐ The organization of the information in the scenario is confusing and unreadable. | ☐ The information in the scenario presents graphically disorganized elements. Some sections are barely readable. | ☐ The information in the scenario is clear and properly organized. There are images that are not exempt from copyright. | ☐ The information in the scenario is clear and properly organized. Images of the authors themselves or exempt from copyright were used. |

## 6.11 Collaborate with your peers

**Start-up**

Educators' collaboration and sharing of expertise play a pivotal role in successfully navigating hybrid learning contexts, which often require innovative and adaptable approaches. By working together, educators can pool their experiences, insights, and knowledge to enhance their hybrid education practices.

**Educator collaboration**

Increasing the quality of collaboration that occurs in educational teams is a promising approach to educational improvement (Ronfeldt *et al*., 2015). In fact, Woodland *et al*. (2013) adds that collaboration seems to be an essential requisite for achieving school improvement. By fostering a culture of open communication, continuous improvement, and mentorship, educators can collectively thrive in the hybrid landscape, providing exceptional educational experiences for their learners. Therefore, shifting from educators working alone to a professional ethic that emphasizes collaboration is needed (Hattie, 2015).

*Developing standards and best practices*

Collaborative efforts can help establish standards and best practices tailored to the specific needs of the hybrid program. By collectively setting benchmarks, educators ensure a cohesive and efficient learning experience for learners.

*Creating shared online resources*

Educators can collaboratively develop and curate online resources, such as lesson plans, multimedia materials, and digital activities. Sharing these resources can save time and effort while fostering a culture of collaboration (Figure 29).



Figure 29. Working with your peers could boost your performance in hybrid education (Credits: Adapted from Freepik)

*Peer feedback and observation*

Encouraging educators to provide feedback on each other's hybrid lesson ideas can lead to continuous improvement and refinement of teaching techniques. Additionally, observing each other's hybrid education sessions can offer valuable insights and constructive critiques.

*Strategies for engagement and inclusion*

Collaborators can exchange strategies for promoting learner engagement, maintaining motivation, and ensuring the inclusion of all learners in the hybrid learning environment.

*Addressing common challenges*

By working together, educators can brainstorm and develop solutions to common challenges faced in hybrid education, such as managing technology issues or adapting assessments.

*Guidance and mentoring*

More experienced hybrid educators can offer guidance and mentoring to those who are new to the model, providing support and sharing tips for a smooth transition.

*Evaluating and recommending improvements*

Collaborative evaluation of the hybrid program can lead to constructive recommendations for improvement, ensuring continuous growth and development.

**Sum-up**

Educator collaboration is an invaluable asset in hybrid learning environments. By sharing experiences, developing best practices, creating shared resources, providing peer feedback, and supporting each other, educators can enhance the quality of hybrid education and ultimately benefit the learners' learning experience.

Educators can come together to share their experiences using new tools and teaching methods in the hybrid environment. Learning from each other's successes and challenges can lead to more effective teaching strategies.

### 6.12 Pay attention to ethics on hybrid education

| | |
|---|---|
| **Start-up** | Maintaining a strong focus on ethics in hybrid education is crucial to ensure fairness, inclusivity, and the protection of educators' and learners' rights and privacy. Next some ideas to help you pay attention to ethics in the context of hybrid education are presented. |
| **Online ethics** | Online ethics, also known as internet ethics or cyber ethics, refers to the moral principles, values, and guidelines that govern individuals' behavior and actions while engaging in online activities. Online ethics is concerned with promoting respectful, fair, and safe behaviour in the digital world, as well as ensuring the protection of individual rights, privacy, and the well-being of others. It involves the responsible and ethical use of the internet, digital technologies, and online platforms. |

Considering that the ethical dilemmas that emerge in the digital realm bear remarkable similarity to ethical dilemmas encountered offline, it should not come as a shock that the most justifiable standards of conduct online align closely with the standards observed in our offline interactions (Johnson, 1997). Online ethics, thus, would seemingly demand adherence to the ensuing overarching principles (Johnson, 1997):

- Know the rules of the forums in which you communicate and follow them.
- Respect the privacy and property rights of others. When in doubt, assume the user wants privacy and ownership.
- Respect the individuals with whom you communicate and those who are affected by your communication; that is, do not deceive, defame, or harass.

Additionally, consider the following ethical dimensions in hybrid education.

| | |
|---|---|
| *Informed consent* | Obtain informed consent from learners and their parents or guardians before collecting any personal data or information through online platforms or technologies. Clearly communicate the purpose and use of data to build trust and transparency. |
| *Privacy and data protection* | Implement strong data protection measures to safeguard learner data. Use secure communication channels, encrypted platforms, and ensure that access to sensitive information is limited to authorized personnel only. |

| | |
|---|---|
| *Digital accessibility* | Make sure all educational content and technology used in the hybrid environment are accessible to learners with disabilities. Provide alternative formats and accommodations to ensure inclusivity. |
| *Equitable access* | Consider the varying access to technology and the internet among learners. Provide support and resources for those who may face challenges in participating in hybrid learning (Figure 30). |



Figure 30. Give attention to learners with special needs in hybrid classes to ensure inclusivity (Credits: Adapted from freepik)

| | |
|---|---|
| *Net neutrality* | Ensure that internet service providers do not discriminate against certain online educational resources, maintaining equal access to information for all learners. |
| *Copyright and intellectual property* | Respect copyright laws and intellectual property rights when using digital materials for educational purposes. Give proper attribution and seek permission when required |
| *Avoid bias and discrimination* | Be aware of potential biases in educational materials, tools, or assessment methods. Strive to create an inclusive and diverse learning environment. |
| *Security measures* | Take necessary steps to prevent cyber-attacks and breaches in the online learning environment. Regularly update software and educate learners about online safety. |
| *Digital literacy education* | Teach learners about digital citizenship, responsible online behaviour, and critical thinking to navigate the digital world safely and ethically. |

| | |
|---|---|
| *Pedagogical integrity* | Ensure that educational practices maintain their pedagogical integrity, regardless of the providing mode. Don't compromise the quality of education in pursuit of technological advancements. |
| *Fair assessment* | Design assessments that are fair and unbiased, considering the challenges and advantages of both in-person and online components of the hybrid model. |
| *Continuous evaluation* | Regularly evaluate the ethical aspects of the hybrid education model. Seek feedback from learners, parents, and educators to identify and address any ethical concerns that may arise. |
| **Sum-up** | By prioritizing ethics in hybrid education, you can create a positive and inclusive learning environment that empowers learners to thrive academically while respecting their rights and privacy. |
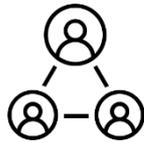
Provide clear guidelines and expectations for learners regarding online participation, netiquette, and academic integrity to avoid misunderstandings and ethical violations.

# 7 ICT to enrich VET hybrid education

**Start-up**

Having the proper equipment and infrastructures is very important to foster VET hybrid education. At this section some useful examples of how to do it, focused on the equipment and infrastructures, are presented.

## 7.1 Facilities and equipment for VET hybrid education

**Start-up**

Vocational training requires the right equipment and facilities. Vocational training schools typically provide specialized software and equipment for their learners. In hybrid education, it is essential that this software and equipment be made available to the learner. Equal access to educational technology is extremely important in order not to exclude any students.

If granting physical access to the equipment proves impractical, consider making alternative arrangements, such as enabling learners to closely observe the activities performed with the equipment, using ICT tools.

**Video study**

Having a video study in a VET school can offer numerous potentialities and benefits for both learners and educators (Figure 31).
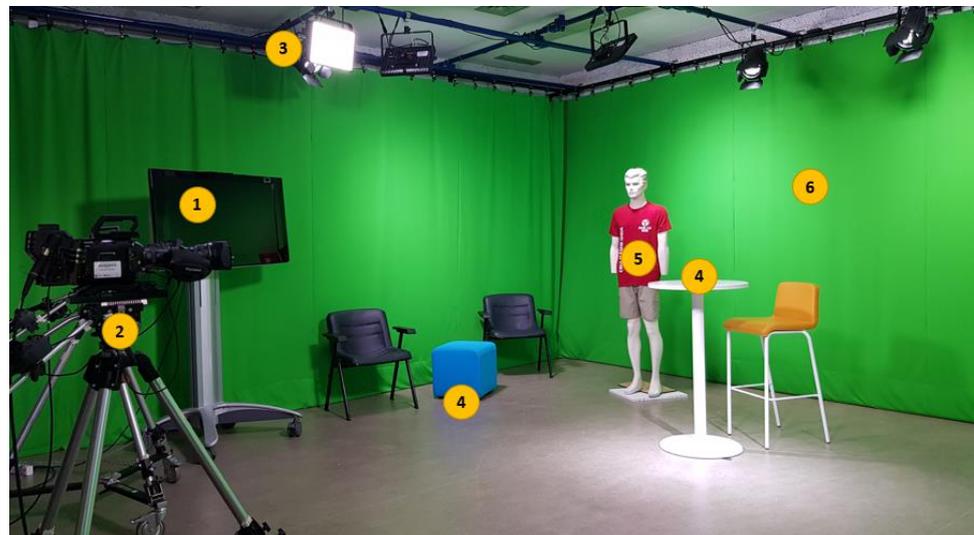


1 | TV that can be used by the technicians and educators to frame the image.

2 | Professional TV camera.

3 | Lightning equipment.

*Key advantages of implementing video studies in a VET school*

4 | Furniture to support talks and presentations.

5 | Dummy to test the framing of the video.

6 | Green screen.

Figure 31. Example of a video study of PISantarém that can be used on VET hybrid education (Credits: Authors).

Next some key advantages of implementing video studies in a VET school are presented:

**Enhancing the learning experience**: Having a video study allows to create videos that can provide an engaging and dynamic learning experience for learners. They can visualize complex concepts, processes, and practical skills, making it easier for them to grasp and retain information. Videos can also include real-life examples, case studies, and simulations, allowing learners to observe and analyze practical applications of their learning.

**Professional development for educators**: Creating videos for VET courses can be an opportunity for educators to enhance their teaching techniques and digital literacy skills. Educators can develop educational videos, tutorials, or interactive video lessons, which can serve as reusable resources for future classes. By exploring video creation and editing tools, educators can also stay updated with technology trends and employ innovative teaching methods (Figure 32).



1 | Mixing desk for editing.
2 | Monitor.
3 | Microphone sound receivers.
4 | Light desk.
5 | Speakers.
6 | Sound desk.

Figure 32. Example of technical devices to control the technical equipment of the video study of PISantarém (Credits: Authors).

**Practical skill demonstration**: VET programs often involve the development of practical skills. Having a video study allows you to create

videos that can capture step-by-step demonstrations of various techniques, procedures, or equipment handling, providing a valuable resource for learners to observe and learn from. This visual demonstration can be especially beneficial for vocational fields that require hands-on training, such as automotive repair, culinary arts, or healthcare.

**Equipment**

It is essential to establish good communication between the learners and the educator, for an effective learning on VET hybrid settings. r. Webcams equipped with voice and/or movement tracking capabilities can play a significant role in achieving this (as shown in Figure 33).



Figure 33. Smart Webcam (Credits: Authors)

In a hybrid education setting, it is essential for the educator in the physical classroom to have access to a large screen or multiple screens. These screens serve a dual purpose: first, they allow the educator to display the lesson materials, presentations, and relevant content for both in-class and online learners to follow. Secondly, the large screens enable the educator to view and interact with the learners who are attending the class remotely. This might include seeing their faces, monitoring their engagement, and identifying if they have any questions or need assistance during the lesson.

Discussions with learners, whether they are physically present in the classroom or participating remotely, can take place in a dedicated setting as shown in Figure 34.



1 | Wall with motivational words.

2 | Flipchart.

3 | Interactive digital board and sound equipment.

4 | Co-working area.

Figure 34. Example of a physical space setting for VET hybrid education:
Eurosuccess co-working space (Credits: Authors).

This type of setup proves highly valuable for providing both theoretical and practical classes that involve computer-based work and the use of specialized software. Certain vocational occupations, such as bricklayers and hairdressers, require specific equipment or facilities for effective training.

In this online learning environment, learners can engage in tasks within a simulated reality while receiving guidance from their instructor. To ensure seamless communication and effective guidance, having a mobile camera available to both the instructor and the learners is highly recommended. This setup enables them to transmit live images back and forth, facilitating real-time interaction, feedback, and instruction.

They can use a head wearable camera, for this purpose. When using a head wearable camera, the learner can have a first-person view of precisely what the educator is doing. Simultaneously, the educator can observe the actions carried out by the learner and assess the correctness of their execution.

**Sum-up**

In hybrid learning, the facilities and equipment used are specifically designed to facilitate effective communication between the learner and the educator, even when they are not physically present in the same location. For successful learning, it is essential that the learner has the opportunity to assess the correctness of the tasks they have completed. To enable the educator to check the tasks effectively, both the learner and the educator need to be equipped with recording equipment and have access to real-time video and audio transmission.

**TIP!**

The communication between online learners and educators in hybrid education is of utmost importance. To ensure a smooth and productive learning experience, it is crucial to provide a secure and fast internet connection.

### 7.2 ICT resources to foster communication between VET educators and learners

**Start-up**

In VET hybrid education an educator needs to have good knowledge of Internet and electronic applications, programs and tools that allow for more effective achievement of educational goals and improve communication between learners in the classroom and online learners, as well as between learners and the educator. On the market you can find a huge number of different applications (paid and free) that can be used for this purpose. In this section you are going to find a description of several methods and applications useful in providing lessons in a hybrid form.

**ICT resources**

It is not always necessary, however, to use computer or Internet applications to improve communication during VET classes.

*Round*

One such method is a traditional round in which each learner has to speak. This is perhaps the easiest way to engage and keep learners' attention. This method is especially useful when summarizing classes, collecting feedback (what thought/reflection accompanies you at the end of our classes?) or collecting learners' opinions on a specific topic (what do you think about such practice?).

*Chat*

Most communicators or platforms that we use for hybrid education have a chat - a very simple tool for communicating with learners online. The chat can be used to ask questions, send links, materials and worksheets, or collect short answers from learners. The VET educator can also use a private chat to contact the learner directly online. The chat can also be used for work in subgroups, brainstorming, and discussions.

There are online tools which make it possible for a VET educator to quickly collect anonymous, short answers from learners, both those in the classroom in face-to-face contact and learners connecting online. There are also tools that allow learners to work together and facilitate cooperation while completing various tasks. Many tools allow you to create quizzes, tests and tasks to be completed by learners, making lessons more attractive. There are also applications thanks to which you can create interesting presentations for learners. A few such ICT tools, which can be useful in providing VET classes in a hybrid form, are described below, in alphabetical order.

*Any-do®*

Any.do® |https://www.any.do/

Any.do® is a task management tool designed to help users stay well-organized, manage their to-do lists, and increase productivity. Any.do can be applied with hybrid education. Educator can assign assignments, readings, and deadlines to manage (Figure 35).
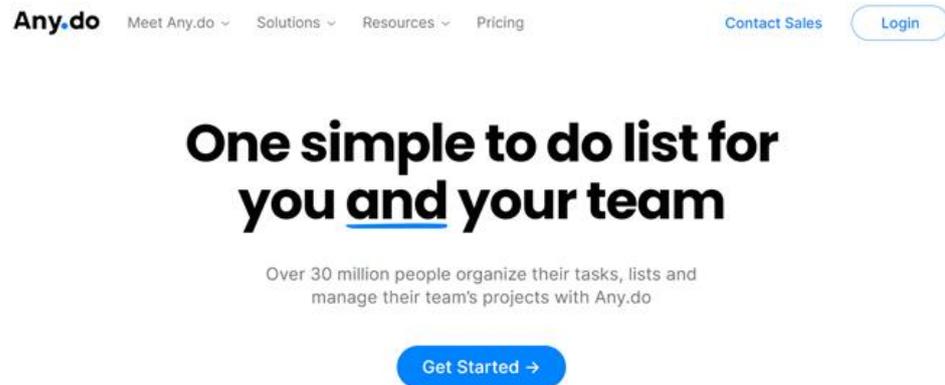


Figure 35. Any.do® app layout (Credits: Screenshot from https://www.any.do/)

Any.do helps learners design to-do lists for each lesson, prioritize assignments, and set reminders for essential due times. Any.do allow learners to allocate time for studying, participating in online classes, and completing coursework. So, they can form their day and they make improvements in their studies. Any.do's collaboration allows learners to share to-do lists and work together on assignments when they are even in different locations.

*AnswerGarden®*

AnswerGarden® | https://www.answergarden.ch/

The AnswerGarden® tool is available free of charge. All you have to do is to enter the question in advance and create a link, so that learners can provide anonymous short answers (up to 40 characters), which appear under the generated link after refreshing the website (Figure 2).

Repeated answers are displayed in larger font, there is also information about how many times a given word has been entered. In the example question: AnswerGarden® is...?, the words "cool" and "interesting" appeared most often (Figure 36).

Figure 36. AnswerGarden® website with sample answers
(Credits: Screenshot from https://www.answergarden.ch/)

The AnswerGarden® tool can be used to: collect questions, opinions, information, learners' expectations, collect ideas during brainstorming, short summary of classes, collect associations, e.g. at the stage of introducing the topic of classes, stimulating the class in a situation of low energy, voting, saving short conclusions, etc. When providing hybrid classes, learners' answers can be displayed on the projector, and online learners will see them on their computers.

*Canva®*

Canva® | https://www.canva.com/

Canva® is an intuitive and easy to use platform to create designs for lesson contents (Figure 37). Educators in VET education can develop online lesson contents for learners. It gives powerful graphic design ideas to learners to cooperate with his friends and educators. Canva also gives educators the opportunity of virtual classroom options that can be used for teaching. Canva also enables you to collaborate with your teammates and colleagues. Using this resource, learners can also do group-work activities and learn from their peers.



Figure 37. Example of a Canva® work (Credits: Screenshot from
https://www.canva.com/)

*Flip®*

Flip® | https://info.flip.com/en-us.html

Flip® is an interactive platform that allows you to conduct discussions using recorded videos (Figure 38). Learners can respond to a video uploaded by the VET educator with their own videos.



Figure 38. Flip® home page (Credits: https://info.flip.com/)

Flip® allows for interactive and creative video communication between the educator and learners and between learners. Educators can ask questions and lead discussions, and learners can share their ideas and opinions on various topics. The platform also offers video editing tools that allow learners to better present their ideas and presentations.

*Genially®*

Genially® | https://genial.ly/

Genially® is a media creation platform focused on designing and sharing media creations and presentations of all kinds. It allows you to generate unlimited slides with interactions and animations. Learners can create different types, including videos, infographics, interactive images, quizzes, and more (Figure 39).

Learners collaboratively cooperate with their peers during school and outside of school to design a multi-modal presentation about any topic. Learners explore contexts in more details thus they are actively participating and learning as they develop the presentation.
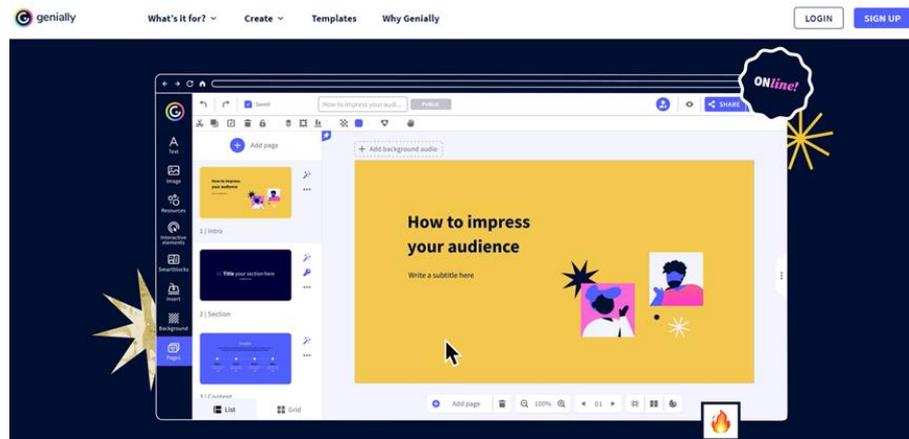
Figure 39. Example of a Genially® content (Credits: Screenshot from https://genial.ly/)

*Google Docs®*

Google Docs® | https://docs.google.com

Google Docs® allow learners to jointly edit or create texts, provided the file is shared in advance  and the link is sent to the editors (each document has an individual link). Google Docs® have editing options similar to, for example, Microsoft Word Office®. Individual editors appear anonymous. Learners at school in front of the computer and learners connecting online can work on the same document. In Google Docs, you can create worksheets, exercises and keep an overview of the learner's work progress.

*Kahoot! ®*

Kahoot!® | www.kahoot.com

Kahoot!® gives you the ability to create interactive learner quizzes, slides, surveys, tests, collecting short answers, or online courses. Creating quizzes requires a user account (the basic version of the application is free for up to 10 players) (Figure 40). Quiz participants log into Kahoot!® with a unique quiz access code. After each question and at the end of the quiz, the system summarizes the results (taking into account correctness and speed of answers).
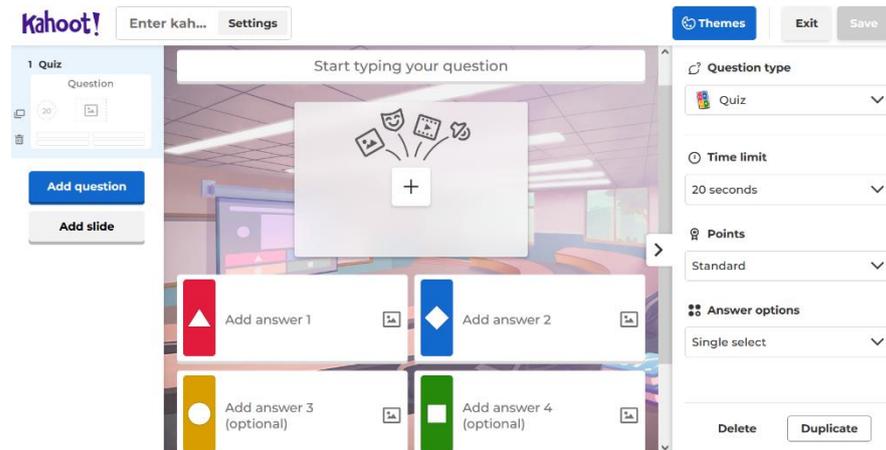
Figure 40.  Sample Kahoot! screen (Credits: Screenshot from
https://create.kahoot.it/creator)

*LearningApps®*

LearningApps® |www.learningapps.org

LearningApps® is a website, available in several languages, with a range of
generators of different activities for learners (Figure 41).



Figure 41. LearningApps® home page (Credits: Screenshot from
https://learningapps.org/)

LearningApps® also contains many ready-made exercises shared by portal
users - other educators. The site allows you to develop over 20 different
types of tasks (quizzes, crosswords, jigsaw puzzles, memory, etc.) (Figure
42). After creating a free account, you can easily create your tasks and save
them on your profile. For each task, a link and a QR code are generated,

which are shared with learners. Using the same link, learners complete the assignments individually (you can't see other people working).
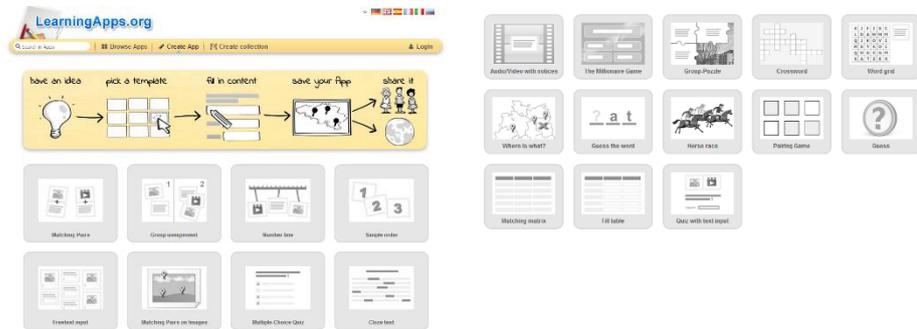


Figure 42. Types of exercises in LearningApps tool (Credits: Screenshot from https://learningapps.org/)

*Mentimeter®*

Mentimeter® | https://www.mentimeter.com/

Mentimeter® allows you to create interactive quizzes, surveys, collect participants' answers and create simple slides (in the free version) (Figure 43). An account is required.
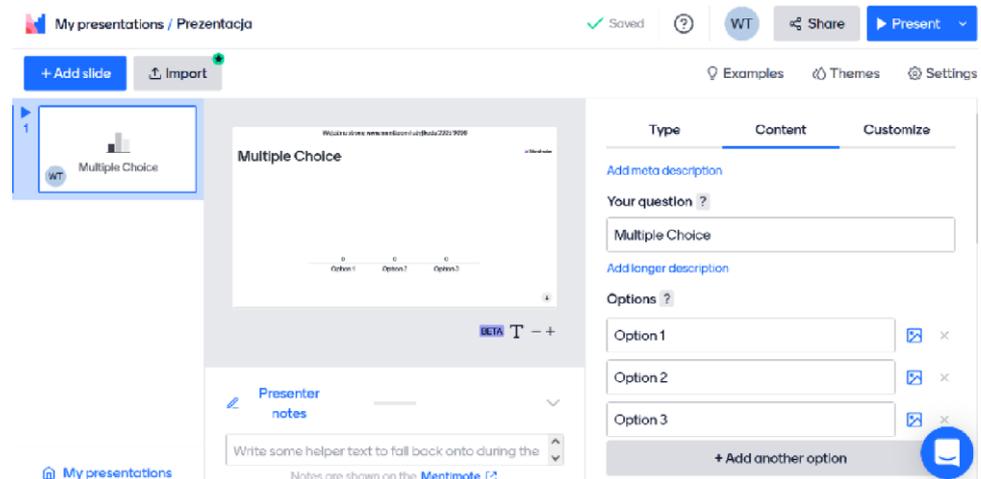


Figure 43. Sample Mentimeter® screen (Credits: Screenshot from https://www.mentimeter.com/)

Mentimeter® gives you an opportunity to anonymously collect learners' opinions/answers, which immediately appear on the slide (in a different arrangement depending on the type of the slide selected). The questions in the quiz are scored on the basis of how fast you can answer them correctly, and the results are displayed after each question and at the end of the quiz. Learners log on to menti.com with a unique presentation access code. At the end of the lesson, they have an option to save the slides to their device.

*Miro®*

Miro® | www.miro.com

Miro® is another virtual board. After creating a free account, you can create your spaces. In addition to adding your own notes, text or simple shapes, Miro also allows you to edit and add charts, tables, diagrams, mind maps, etc. You can also add icons, comments to already posted information/notes (Figure 44). The free version of the application also allows editors to chat.
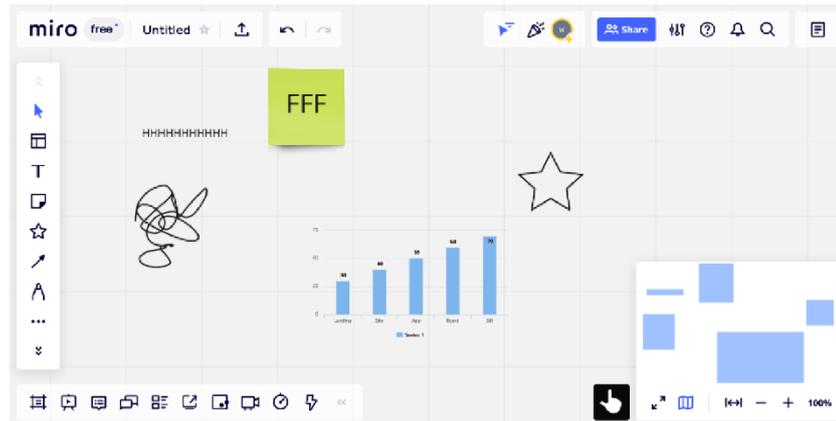


Figure 44. Sample Miro® board (Credits: Screenshot from https://miro.com/pt/)

*Moodle®*

Moodle® | https://moodle.com

Moodle® is an e-learning tool. It helps VET educators to conceptualizing different courses and lesson contents to interact with learners online. Moodle will empower VET educators to enhance the education environment with open-source eLearning programmes. It is widely used around the world as a tool for creating online active teaching sites and supporting online training. Learners can search studies, help to design products and projects and give feedback to VET educators and learners. Educators can create Moodle lessons for learners to interact.

*Note.ly®*

note.ly® | Play Store

The note.ly® tool is a virtual cork board to which we can attach virtual posts with notes. After creating a free account and sending the link of your board to learners, it will be possible for each of them to anonymously add their own note, list or photo (image) (Figure 45). Learners can also categorize notes previously prepared by the educator by moving them around the board.
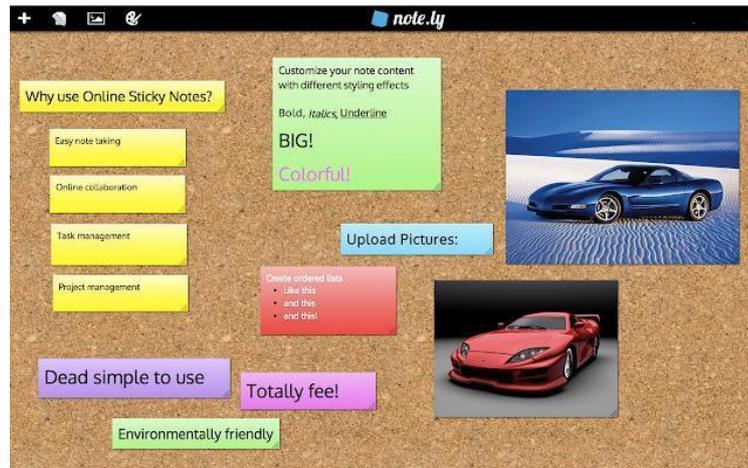
Figure 45. Note.ly® - Online Sticky Notes (Credits: Screenshot from note.ly)

*Pinterest®*

Pinterest® | https://tr.pinterest.com/

Pinterest® is a social media platform that allows users to discover, save, and share images, videos, and other visual content. The platform functions as a virtual pinboard, where users can organize thematic collections of images and multimedia known as "boards" (Figure 46).
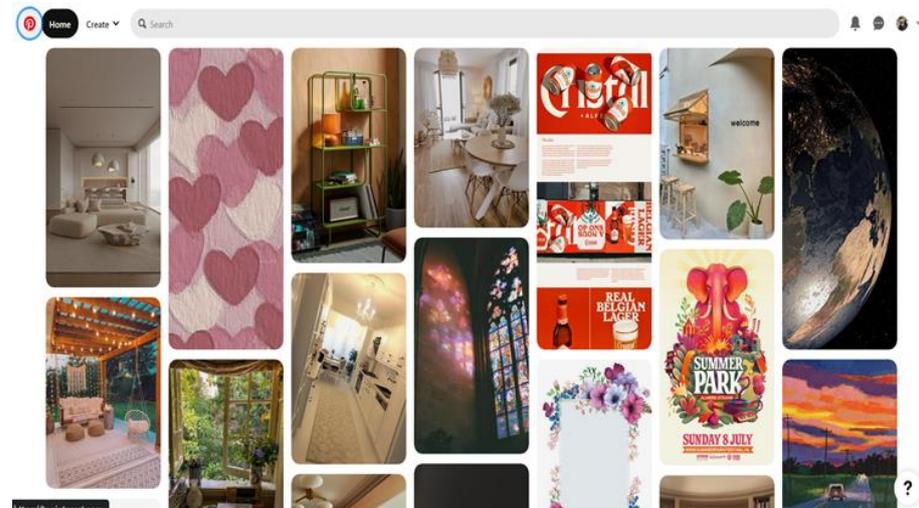


Figure 46. Example of Pinterest® visual content (Credits: Screenshot from https://tr.pinterest.com/)

Users can "pin" or save content from across the web or within the Pinterest platform to their boards, organizing and categorizing them based on their interests. Pinterest can be associated with distance education in several ways such as Visual Learning Resources, Resource Collection, Project Collaboration, Virtual Field Trips, Professional Development, Visual Course Content.

*Powtoon®*

Powtoon® | https://www.powtoon.com/).

Powtoon® is an online program for creating simple animations (This is a presentation creator in the form of a cartoon (Figure 47). It contains many templates that can be freely modified (an account is required), but you can also create your own videos (free version up to 5 minutes), which can be a very attractive message for learners.
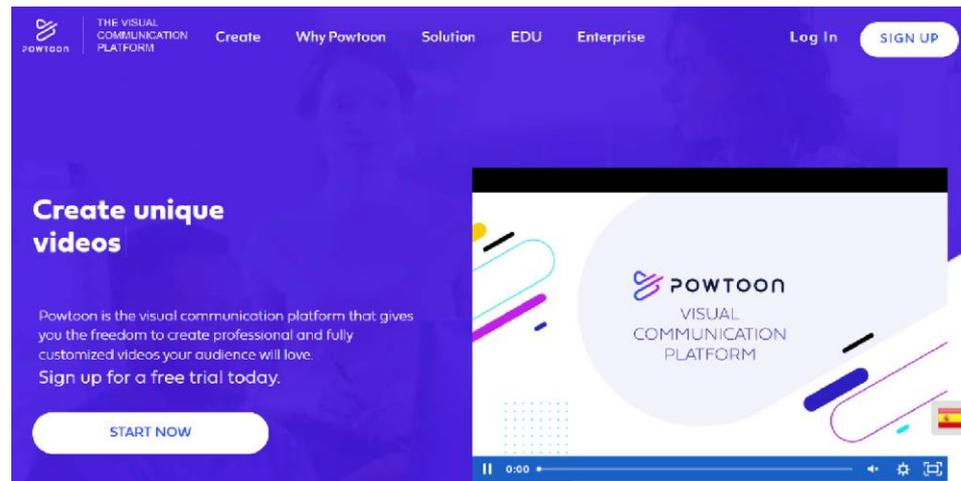


Figure 47. Powtoon® home page (Credits: Screenshot from https://www.powtoon.com/)

*QuiverVision*

QuiverVision® | https://quivervision.com/

QuiverVision® is an augmented reality app that improves engagement, motivaton to learn and overall achievement in the classroom (Figure 48).



Figure 48. Plant cell visualized by QuiverVision® app (Credits: Screenshot from Plant QuiverVision)

**Sum-up**

Virtual environments allow for the use of educational approaches based on online pedagogical tools. These types of tools contribute in pedagogical and methodological ways, providing both educator and learner with an optional way of teaching and learning: hybrid education. It also helps to mobilise the use of pedagogies such as flipped classromm and collaborative learning, among others, enhancing flexibility and class atmosphere.

It is essential to point out the importance of these tools in the virtual world, since they contribute for learners to develop digital skills. These tools offer an individual and flexible environment for the VET educators.

**TIP!**

There are tools on the market that can support the educator in VET hybrid education. Most of these tools have a free basic version. It is worth testing these tools before making a decision to buy them - extending the possibilities. Remember that the lesson is supposed to be effective, not just attractive. Excessive variety of ICT tools in one lesson can hinder learners' acquisition of knowledge and skills and make communication more difficult rather than easier.

### 7.3 Technical support

**Start-up**

In the context of hybrid education, reliable technical support is an indispensable aspect for effectively troubleshooting and resolving issues related to the implementation of new educational technology tools and platforms. Having a well-established technical support system is essential to maintain a seamless learning experience for both educators and learners.

**Technical support**

As technology continues to transform education, reliable technical support becomes indispensable in facilitating smooth operations within hybrid learning programs. In this section, we will delve into the crucial considerations and strategies that educational institutions should employ to provide effective technical support for educators and learners in hybrid learning environments. By establishing a robust support framework, schools can empower their learning communities to fully harness the potential of technology, ensuring uninterrupted and enriching educational experiences (Figure 49).

Moreover, by carefully considering key factors such as response times, remote access capabilities, and the availability of self-help resources, educational institutions can create a supportive framework that enhances the overall learning experience and ensures seamless integration of technology in the classroom.



Figure 49. When a problem urges (A), having a quick access to technical support (B) is essential in hybrid education (Credits: Adapted from Freepik)

| | |
|---|---|
| *In-house vs. outsourced support* | Schools must determine whether their existing IT staff can adequately handle technical support or if it is more practical to partner with a third-party provider. Balancing costs and expertise are essential in making this decision. |
| *Self-help resources* | Providing self-help resources such as FAQs, knowledge bases, and user forums empowers users to find solutions to common issues on their own. This reduces the dependency on direct support and allows for quicker issue resolution. |
| *Accessibility of support* | Technical support should be readily available to educators and learners during regular school hours, accessible through various channels like email, phone, chat, or in-person visits. |
| *Defined response time* | Establish clear timeframes for response and resolution of technical issues, ensuring that support requests are addressed promptly (e.g., within 24-48 hours). |
| *Remote access capability* | Granting the ability to remotely access devices to technical staff (with user consent) enables faster diagnosis and resolution of problems, especially when on-site visits are not feasible. |
| *Visibility and contact details* | Ensure that educators and learners are aware of and have easy access to contact details for technical support. Clear communication channels foster a sense of trust and reliability. |
| *Training for tech staff* | Technical support personnel should receive specific training on the new educational tools and platforms deployed to effectively assist users. |
| *Follow-up and feedback* | Ask feedback from users after resolving issues to identify common problems and improve the support system continually. |
| **Sum-up** | A robust technical support system is instrumental in maximizing the potential of educational technology in hybrid learning models. Proactive assistance, rapid issue resolution, and the provision of self-help resources prevent learning disruptions and empower educators and learners to navigate technology confidently |

Be prepared for technical problems! Effective technical support is the backbone of a successful hybrid educational environment.

## 8    Final remarks

This manual presents a global pedagogical approach to hybrid education through the description of a comprehensive hybrid education model for VET schools, focused on the development of 21st century skills and soft skills, with an emphasis on ICT. The partners of the project believe that this model, due to its potential to keep the VET learners motivated, can reduce dropout which is a significant problem of some VET courses.

In conclusion, hybrid education emerges as a dynamic and transformative approach that effectively addresses the evolving needs and challenges of modern education. By integrating the best aspects of both online and traditional classroom settings, hybrid education fosters a flexible and inclusive learning environment that empowers learners and educators alike. However, it must be stressed that although this VET hybrid educational model has a strong focus on online learning, practical application and hands-on experiential learning remain essential components of hybrid VET education.

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