

Digital
Facilitator
Trainer Role



THE DIGITAL FACILITATOR TRAINER ROLE

**THE ROLE OF THE DIGITAL FACILITATOR
IN VOCATIONAL EDUCATION**



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VET – Vocational Education and Training

DIGITAL FACILITATOR TRAINER ROLE

DigiFacT

The Role of the Digital Facilitator in Vocational Education

Information

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Abstract	<p>The development and use of digital technologies have spread like waves over schools and society, being accelerated by the COVID-19 pandemic. Rapid growth and enhanced access to technologies are said to pose new possibilities to teach and learn.</p> <p>Digitalization of education is a powerful trend in terms of reformation and modernization of the global education environment. Digitalization means transformation of all information types (texts, sounds, visuals, video and other data from various sources) into the digital language. Digitalization in education refers to the use of desktop computers, mobile devices, the Internet, software applications, and other types of digital technology to teach students of all ages.</p> <p>Digital Facilitator Trainer role represents a comprehensive pedagogical methodology which includes ITC tools to insert in the field of digital education.</p>
Keywords	Artificial intelligence, gamification, data analytics, digital facilitator, digital tools, digital skills, training, instructional design, teaching methodology, competence map, DigCompEdu, 5E Model



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Summary

This report has been developed as a part of the DigiFacT project, co-funded by the Erasmus+ program of the EU, carried out by three organizations from Türkiye, (Osmaniye MEM), Spain (Femxa Formación S.L.U.) and Romania (TEAM4Excellence).

DigiFacT is a project co-funded by the Erasmus+ programme of the European Union that creates and designs the new figure of the **Digital Facilitator Trainer** for VET educators/trainers and learners. The objective of the project is to improve the digital skills of VET teachers and trainers in using digital technologies and open pedagogies to support the development of digital competences of educators from vocational education and training. This innovative learning methodology for teaching and learning digital technology focuses in 3 fields: Artificial Intelligence (AI), Gamification and Data Analytics.

DigiFacT addresses a huge gap in the VET community in Europe, the lack of digital learning resources in teaching, essential to help educators to develop their own digital skills, with the ultimate purpose of engaging their students and provide them with the key knowledge and skills in the digital era.

This report offers the transnational report of project partner countries (Türkiye, Spain and Romania) on the digital implementations in education and training and the best practices of using AI, gamification, and data analysis in digital education, the report of separate surveys for VET teachers, trainers and students and the report of interviews done by VET workers, the guidelines for VET teachers and trainers and the last chapter is the map of digital competences required in VET educators today, following the state-of-the-art of digital education, the recommendations of the DigCompEdu Framework by the European Commission, and the prior findings of the research developed as part of the project.



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Research methodology

Introduction

The use of digital content in education worldwide was relatively uncommon before the crisis started. Only 20% of countries had digital learning resources in teaching, but only in some schools. A mere 10 per cent of countries had more robust digital learning capabilities offering some of the educational materials available outside of school.

According to the World Bank, no country has a universal digital curriculum for teaching and learning. These numbers paint a picture of the efforts that governments and schools had to take to rapidly move to distance learning to ensure continuity of learning. The other part of the equation is how educational institutions are equipped for online learning, and how well teachers are prepared for, and engaged in online teaching. Teachers need to quickly adjust their teaching methods and learning expectations. Is in this context when the figure of the digital facilitator trainer (DFT) became necessary.

We detected that in some countries the educational entities took charge of the demand for training in the use of virtual classrooms and telematics media, the use of Artificial Intelligence (AI), gamification, and data analysis for improvement of educational services. During Pandemic, AI became an instrument of measurement parameters, that we didn't pay attention before, for instance, a good example in Spain was the final university examinations included new AI tools to avoid cheating, following up and monitoring any movement during the test time.

Gamification is also considered by all the VET community as an efficient tool but never before the standard of a good training course will be depend on the inclusion of some game, quiz or another tool prepare to engage participants in the online training. The quality of the gamification is improving year by year and now is especially important to be managed by the DFT.

Finally, we included Analytics, since from the consortia we detected the gap pre-existent in the use of data to improve the leaning models. Since the online was a fact during this period of crisis, the needs changed and move to improve this methodology. On the other hand, by implementing systematized data analysis, we facilitate the standardization of the tutoring protocol that defines the pedagogical methodology used.

The objectives of this project are:

- Development of a new methodology according to the recently needs in VET education
- Combining the 3 countries expertise to face new challenges in online VET education.
- Creating an innovative new figure, a DFT, with digital pedagogical skills and knowledge enough to be the trainer of trainers as an expert in AI, gamification and analytics
- Developing and testing different training courses to be a DFT in delivering professional development for VET teachers and trainers, according to their own local reality
- Fostering innovative learning opportunities and provide learning materials for professional development for VET teachers and trainers
- Building high-quality digital contents: digital open repository and best practice exemplars of using technology for teaching and training in VET in school and workplace settings
- Development of a Digital Community in the use of technology for digital training in VET in Europe The direct target groups of this project are: VET educators interested in improving their digital skills in AI, gamification and data analysis. They need to add to their toolbox of non-formal education methods using digital resources in EN and own languages (TR, RO, ES). The few existing resources are mainly in English, rarely accompanied by lesson plans to support their implementation.



The indirect target groups are young people between the ages 18-29 who need new ways of learning. We will provide the new knowledge, skills and attitudes, which in turn can contribute to their employability and improve their social inclusion prospects. The second target groups are youth organizations, institutes, VET centres, NGO's, foundations and other non-profit organizations collaborating with youth, private companies. They need to harness the potential that digitalization represents to prepare youth for a society immersed in technology.

This project should be run internationally because the partner countries also have the same objectives for the same target groups in their countries. And the outputs of this project can be used internationally because many countries are facing the same problems in the digitalization in education. With the sudden emerge of Covid-19 the world face online systems as a must and trying to manage this period by doing their best and in cooperation and collaboration with the countries exchanging their best practices.

This project is in line with European initiatives as the Framework of Key competences for lifelong learning and the European Framework for digital competences. Despite of all efforts made by public and private actors; a large mass of European trainers realized during the Pandemic crisis that exists a lack of AI, gamification and analytics skills in the VET trainer sector.

We will encourage and foster cross-discipline learning, partnerships between education, training and learning actors. The project will increase the knowledge that VET entities, teachers and trainers and stakeholders have about the European frameworks. Participants will also have an easy way to certify their digital competences (open badge) and will also be the digital trainer of trainers by offering an Open Digital Community as an innovative solution in VET, in line with European policies.

Target groups

This course is specially created for people who contribute directly to the educational activities and want to have a digital teaching style, such as digital facilitator and trainers.

Giving trainers this opportunity, at least once, is surely a fundamental aim of trainer development, but in an 'ordinary' classroom this awareness is a key element of the modification of schemes. Effective trainers in the digital age context will be part of a highly skilled profession focused on student learning. The trainers will have strong content knowledge appropriate for the level and subjects being taught, pedagogical content knowledge, the ability to cement learning relationships, and understand how to gather, analyse and apply learning data within their teaching practice. Digital innovations provide communication tools, electronic evidence management and analyses systems and will continue to be developed to enable and enhance the process of teaching and learning.

Methodology

Developments in the field of information and communication technologies lead to more important transformations than ever before in all areas of economic and social life. No sector or country will be excluded from this process. Those who fail to realize the opportunities that the digital age will create and adapt themselves to the dynamics of the age will lag behind this age.

The specific aim in education field after Covid-19 pandemic is to promote networking of institutions across the EU, sharing their resources and expertise, and collaboration with technology through a new model of digital training. With this purpose, providers and experts in educational technologies and relevant pedagogical practice develop tailor-made solutions adapted to local challenges and



realities. With this, our innovative approach with the DFT role is to test and implement innovative practices in the field of education, training and youth.

The Digital Education Action plan built on the 2018-2020 plans had the following priority areas: making better use of digital technology for teaching and learning, developing digital competencies and skills and improving education through better data analysis and foresight. Due to that plan project partners from Osmaniye, Spain and Romania discussed on the project structure and determined DigiFacT project objectives, project results and activities are based on those priorities. The aim of this project is to boost educators' and trainers' digital competences in Gamification, Artificial Intelligence and data analyse to engage and support the training with young people, adapting their know-how to new online learning.

Desk research

Digital Facilitator Trainer role represents a comprehensive pedagogical methodology which includes ICT tools to insert in the field of digital education. In this project output, IO1A7, you will get a general idea on the state of art of partner countries on the digitalization in education. The project partners did desk researches on the integration of digital tools into education, especially VET education and prepared their national reports on 'Digital tools and best practices in the use of gamification, Data analytics and artificial intelligence in education. In the light of partners' national reports (Türkiye, Spain and Romania) a European Report is prepared to have an idea on the state of art of the partner countries on the integration of digitalization in VET education and the required skills of VET teachers and trainers.

Digital tools and platforms are becoming more and more integral to our social and working lives. Digital learning increases students' access to education and knowledge that empowers students with a mindset and capabilities that sets them up for success in their present and future. Moreover digital tools have important advantages for making processes more consistent, secure, efficient, and effective. As institutions support staff and students across a broader range of geographies with a broader set of needs, the case for digital solutions only grows.

In addition to the already set methodology for the desk research, the method used for the collection of digital instruments was, elaborating a prior selection of tools and platforms with good reviews, used in digital education in the last years. The selection included different items that are based on three criteria: success (the tool/platform was commonly used, and it is considered popular based on positive posts and news published), accessibility (including a user friendly lay out, availability free of charges, and compatibility with multiple devices, i.e., PC, tablet, smartphone) and the offer of innovative and diverse functions.

Following the research about different platforms based on gamification, artificial intelligence and data analysis, we also discovered a wide variety of tools and instruments that aid the process of education in digital times. Some of them are known and used on a worldwide scale, some are just gaining terrain, but provide a great experience, for both students and teachers. The Desk Research in Turkey, Romania and Spain concluded in a transnational research report. The desk research included searching for:

- Best practices of using AI, gamification, and data analysis in digital education
- Tools and instruments for digital education
- Skills and competences required in educators for using these digital tools and instruments



Primary research

The three organizations from the three partner countries: Türkiye (Osmaniye MEM), Spain (FEMXA) and Romania (T4E) has developed an online survey to analyze what is exactly the level of the digital competencies and what the areas are that VET educators find more difficult and the real needs of VET students in the VET community in the three countries. Also with a particular emphasis in Gamification, Data Analysis and AI as these are the areas that our Digital Facilitator Trainer and hosting program focuses on. The report of this survey portrays an accurate enough pictures of the gaps found in VET educators' digital competences.

VET experts survey

The technique implemented for the collection of the data is an online survey elaborated using the Microsoft Forms tool. The questionnaire is made available in the three national languages of the DigiFacT consortium: Spain, Türkiye, and Romania. The online survey is disseminated by the consortium organizations for the period of a month. The original target group was set at 75 VET teachers and trainers corresponding to the population we wanted to assess, educators of the vocational education and training systems of the three European countries. However the partners reached more than the targeted number and in this report you will see the results of the responses of a total of 121 educators and 182 VET learners.

Since Vocational education and training (VET) educators require professional as well as pedagogical knowledge to prepare students for the job market, teacher's education and training programmes should aim to develop innovative teaching and learning approaches and digital skills. Therefore, teachers' training needs should be assessed to make sure they are equipped with the right tools for the labour market's demands. For that reason, partner organizations conducted survey with the VET workers to analyse the level of digital competences of VET teachers in order to find the gaps in the educators' competences. The aim of the survey was:

- To assess the educators' technical and pedagogical skills when implementing digital instruments in teaching.
- To evaluate the teachers' ability to engage through digital tools with the students.

The research about the actual level of the digital competencies of VET educators in the three countries of each of the partner organizations: Spain (FEMXA), Türkiye (OMEM) and Romania (T4E), has developed an online survey to collect data on as the data collection technic. This online questionnaire has been designed to analyze what is exactly the level of digital competences and what are the areas were VET educators find more difficulties. Also, with a particular emphasis in Gamification, Data Analysis, and AI, as these are the areas that our Digital Facilitator Trainer and hosting platform will focus on.

The following report portrays an accurate picture of the gaps found in VET educators' digital competences, as we gathered this information directly from the educators themselves. The objectives of the quantitative research that were followed during the design phase of the survey questions were to:

- Obtain the overall knowledge VET educators have regarding the utilization of different digital tools and processes in their teaching in the three different countries of the partners organizations: Spain, Romania, and Türkiye.
- Analyze the level of technical and pedagogical ability of VET educators when using digital resources to satisfactory engage with students and enrich their teaching techniques.
- Obtain a closer analysis on the skills and knowledge of VET educators regarding Data Analysis, Gamification and Artificial Intelligence applied to education.

The phases that were followed during the research were:

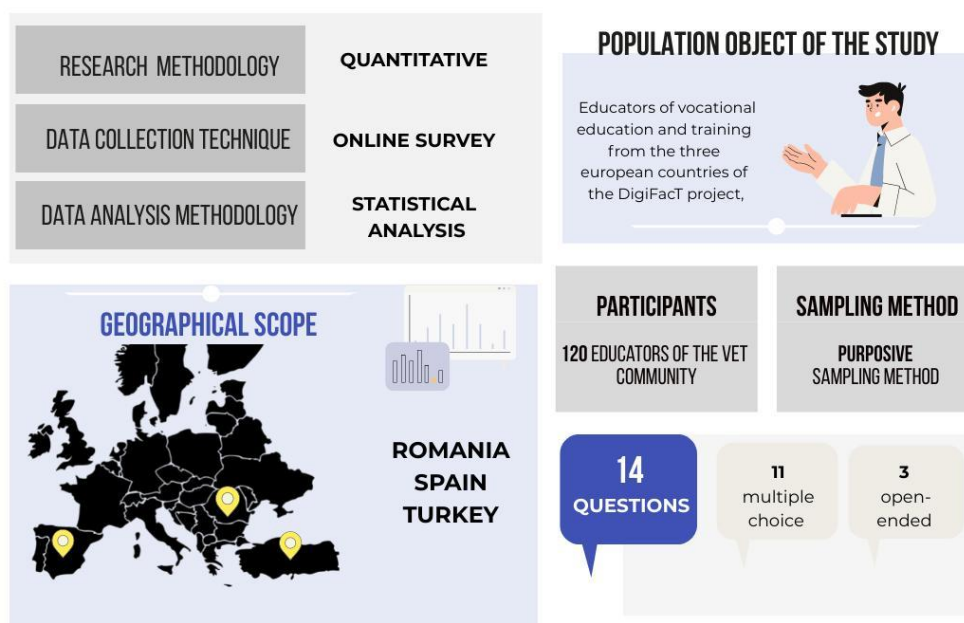
Phase I: Design of the quantitative research tool

Based in the previous research developed during the DigiFacT project and other relevant publications, and primarily, the Digital Competence Framework for Educators (DigCompEdu), the researching team of Femxa S.L.U. designed the survey questions. The questions are divided in blocks, each one corresponding to the following research questions:

- What is the general level of competencies and experience of VET educators in using digital tools?
- What are the technical and pedagogical skills of educators using digital tools in the five designated categories?
- What is the level of knowledge and experience of educators have regarding GA, DA and AI?
- What is the level of skills of educators in the use of digital tools and platforms that use GA, DA, IA?

At the same time, these are aligned with the objectives of the research priorly described.

The technique implemented for the collection of the data was an online survey elaborated using the Microsoft Forms tool. The questionnaire was made available in the three national languages of the DigiFacT consortium: Spain, Türkiye, and Romania.



Phase II: Field work

The online survey was disseminated by the consortium organizations for the period of a month. The original target group was set at 75 individuals corresponding to the population we wanted to assess, educators of the vocational education and training systems of the three European countries. The results of the dissemination gathered the responses of a total of 121 educators.

Phase III: Analysis phase

The statistical analysis of the results gathered was developed in the following steps: *Collection of the data* obtain with the survey; *Disposition and organization of the data* in a common spreadsheet; *Statistical analysis of the data* considering the objective of the research. For this to be possible the analysis attends to the classification system in blocks that allows to identify each specific survey



question with the corresponding research questions and those with the consequent general objectives of the quantitative research (block 1, block 2, block 3 or block 4.); *Organization and presentation of the results* in a visual and graphical format.; *Drawing conclusions* based on the results of data interpretation; *elaboration of the research report*.

VET students survey

The research about the actual level of the digital competencies of VET students in the three countries of reach of the partner organizations: Spain (FEMXA), Turkey (Osmaniye MEM) and Romania (T4E), has been developed using an online survey as the data collection technique. This online questionnaire has been designed to analyze what is exactly the level of digital competences and what are the areas where VET students find more difficulties. Also, with a particular emphasis in Gamification, Data Analyses, and AI, as these are the areas that our Digital Facilitator Trainer and hosting platform will focus on.

The following report portrays an accurate enough picture of the gaps found in VET students' digital competences, as we gathered this information directly from the students themselves. The objectives of the quantitative research that were followed during the design phase of the survey questions were to:

- Obtain the overall knowledge students at VET schools have regarding the utilization of different digital tool and processes in their learning in the three different countries of the partners' organizations: Spain, Romania, and Turkey.
- Analyze the level of technical and pedagogical ability of VET students when using digital resources to satisfactory engage with peer students and enrich the way they learn the best.
- Obtain a closer analysis on the skills and knowledge of VET students regarding Data Analysis, Gamification and Artificial Intelligence applied to education.

The phases that were followed during the research were:

Phase I: Design of the quantitative research tool

Based on the previous research developed during the DigiFacT project and other relevant publications, and primarily, the Digital Competence Framework for Educators (DigCompEdu), the research team of Osmaniye MEM. designed the survey questions. The questions are divided in blocks, each one corresponding to the following research questions:

- What is the general level of competencies and experience of VET students in using digital tools?
- What are the technical and pedagogical skills of students using digital tools in the five designated categories?
- What is the level of knowledge and experience students have regarding GA, DA and AI?
- What is the level of skills of students in the use of digital tools and platforms that use GA, DA, and IA?

At the same time, these are aligned with the objectives of the research priority described.

The technique implemented for the collection of the data was an online survey elaborated using the Microsoft Forms tool. The questionnaire was made available in the three national languages of the DigiFacT consortium: Spain, Turkey, and Romania.

Phase II: Field work

The online survey was disseminated by the consortium organizations for the period of a month. The original target group was set at 75 students corresponding to the population we wanted to assess what VET students already know about digital tools used in vocational education and training



systems of the three European countries. The results of the dissemination gathered the responses of a total of 182 students.

Phase III: Analysis phase

The statistical analysis of the results gathered was developed in the following steps: *Collection of the data* obtained with the survey; *Disposition and organization of the data* in a common spreadsheet; *Statistical analysis of the data* considering the objective of the research. For this to be possible the analysis attends to the classification system in blocks that allows to identify each specific survey question with the corresponding research questions and those with the consequent general objectives of the quantitative research (block 1, block 2, block 3 or block 4).; *Organization and presentation of the results* in a visual and graphical format.; *Drawing conclusions* based on the results of data interpretation; *elaboration of the research report*.

VET Workers interviews

Vocational education and training (VET) educators require professional as well as pedagogical knowledge to prepare students for the job market. At the same time, teacher's education and training programmes should aim to develop innovative teaching and learning approaches and digital skills. Therefore, teachers' training needs should be assessed to make sure they are equipped with the right tools for the labour market's demands.

The following report is one of the pillars of the transnational research that the DigiFacT consortium is developing to design a digital platform and the role of the Digital Facilitator Trainer (DFT) based on the real needs of educators in the VET community in the three countries. Together with desk research of best practices and tools available, quantitative research of the needs and gaps of VET students and teachers/trainers, this transnational research lays the foundation for what will later become Instructional Design Guidelines for the construction of the DigiFacT digital platform and the DFT. The current research is based on individual interviews with key personnel of vocational education and trainer providers.

To achieve the aim of the study, the research team set out the following specific objectives:

1. To assess the educators' technical and pedagogical skills when implementing digital instruments in teaching.
2. To evaluate the teachers' ability to engage through digital tools with the students.

To analyse the three key skills mentioned above (the educators' professional and pedagogical competencies, and the learners' competences in using digital tools), ten interview questions were designed using the six areas outlined in the European Framework for the Digital Competence of Educators (DigCompEdu) as a base.

Area 1 is related to the professional environment of the educators, their use of digital tools when interacting with colleagues, learners, and parents.

Area 2 focuses on the competencies needed to effectively and responsibly use and create digital resources in the classroom.

Area 3 targets the teacher's ability to adopt innovative pedagogical practices.

Area 4 looks at the use of digital technologies as a tool to assess and improve the learners' performance.

Area 5 puts the focus on the inclusivity and accessibility of the technology used.

Area 6 details the competencies required to empower learners to use digital technologies safely and responsibly.

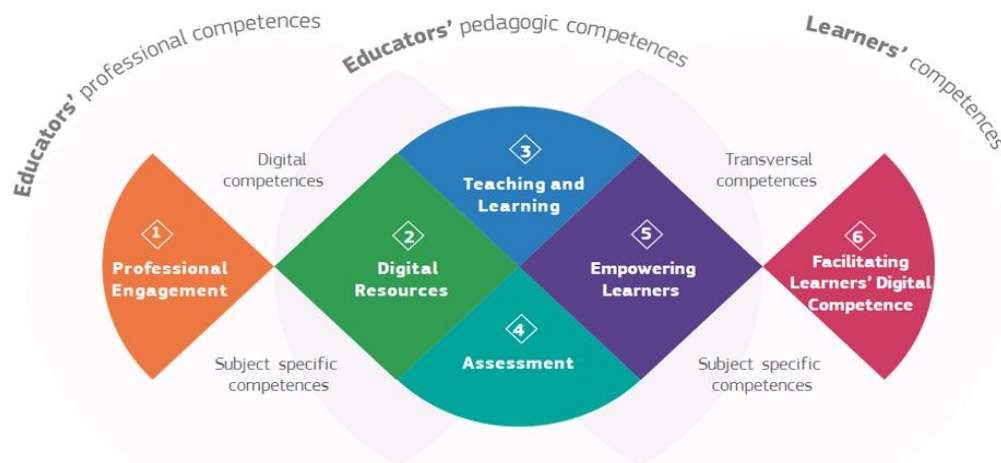


Figure 1: DigCompEdu areas and scope

Semi-structured interviews were conducted to analyse VET educators' competences in these six main areas. In order to better guide the answers of the interviewees, three domains of digital technologies were chosen:

- Data analysis tools (to track students' academic performance),
- Gamification (to increase students' engagement during classes), and
- Artificial Intelligence (to facilitate the teacher's tasks and individualise learning)

The interviews were designed to allow for the generalisability and transferability of the research. Although the methodology utilises restricted numbers of samples, the sample selection envisages interviewees covering several VET education areas across the three countries, including professionals with expertise in VET education, combining formal and non-formal education towards employment.

The following report portrays an accurate enough picture of the gaps found in VET educators' digital competences, as we gathered this information directly from the educators themselves.

The phases that were followed during the research were:

Phase I: Design of qualitative research tool: semi-structured interviews

Based on the previous research developed during the DigiFact project and other relevant publications, and primarily, the Digital Competence Framework for Educators (DigCompEdu), the research staff of TEAM4Excellence (T4E) designed the interview questions. This phase included the following:

- Researching the level of digital competences of VET teachers, assessing the educators' technical and pedagogical skills when implementing digital instruments in teaching and evaluating the teachers' ability to engage through digital tools with the students are complex research tasks. To design meaningful qualitative research, the researchers consulted several reports and publications from relevant institutions, successful projects about the object of study, relevant news and blog posts, manuals about methodology on quantitative research in education.
- Designing the interview questions to analyse the level of digital competences of VET teachers, specifically in the data analysis, gamification and artificial intelligence domains, using the DigCompEdu framework as a starting point.
- Translating the interview questions in project partner languages.

Phase II: Fieldwork



Upon completion of Phase I, each partner organisation carried out the following:

- Contacted potential interviewees and provided them with general information about the project and interview. Also, interviewers emphasized the confidentiality and anonymity of the interviews. The initial approach message (example included at (Appendix 1) was sent over email or via other online communication channels (e.g. WhatsApp, Telegram, Messenger, etc.).
- Provided the interview areas and questions to those interested to participate in the interview. This was done so interviewees could get acquainted with the interview themes.
- Scheduled the interview at a date/time convenient for both interviewer and interviewee

The minimum number of interviews is 3 (three) per organization, 9 (nine) surveys in total. OMEM completed 5, while FEMXA and T4E carried out 3 interviews. Each interview took approximately 30 minutes. During the interview, the interviewer took notes. The transcripts of the interviews were anonymised with the acronym of the organisation and interview number (e.g. T4E-1) and provided to T4E to carry out the analysis of data and the final report on the interviews.

Phase III: Analysis phase

The analysis phase included the following:

- Recollection of the anonymised partial transcript data obtained during the interviews.
- Analysis of the data considering the objective of the research that has been already set. For this to be possible, the analysis attended to the classification system in areas that allows identifying each specific interview question with an already set general researching theme (Areas 1 to 6).
- Organizing and presenting the results in a clear, concise and coherent way.
- Drawing conclusions based on the results of data interpretation.

Based on the desk research on the state of the art of partner countries in digital education and the digitalization of teachers in their courses we have created a transnational report of participating countries giving an idea of the state of teachers in digital education. Based on the desk researches and primary researches with the surveys for VET teachers and VET students and interviews for VET workers we have prepared the:

Guidelines for VET Teachers and Trainers

The ongoing digitalization in the training sector produces new demands on the media-didactical competence of trainers. Technology-based learning plays a significant role in training and development and there is growing pressure on trainers to implement distance learning and online learning strategies for their students in these difficult times. As we work together to bring the best in online collaboration and learning tools, students around the world need to be able to continue with their educational career. Changing drastically from face to face to online lessons in the blink of an eye can seem daunting to both trainers and students. To help ease this task and in solidarity with our fellow team, the guidelines for VET teachers and trainers would like to offer some bits of advice and a few ideas on how to use some tools for online and distance teaching in 5E model. The purpose of this guideline is to research digital teaching platforms in accordance with the 5E instructional model. Using digital technologies while training will promote innovation in education. Technology in education can boost variety and increase the diversity of learning environments and opportunities and enhance the quality of the learning experience by making class content more varied and accessible to almost each individual learner. Thus, ensuring more participation and engagement among learners.



Competence Map

Competence mapping is the process of identifying the specific skills, knowledge, abilities, and behaviors required to operate effectively in a specific trade, profession, or job position. Competency maps are often referred to as competency profiles or skills profiles. Specifically in the field of education, maps are how skills and competencies, or competency definitions can be aggregated to form more comprehensive skills and competencies or decomposed into component skills or competencies. Taxonomies are simple maps in the form of trees, according to the IMS Reusable Definition of Competency or Educational Objective - Best Practice and Implementation Guide. The DigiFacT consortium has chosen to use the DigCompEdu Framework as their reference document. The European Framework for the Digital Competence of Educators (DigCompEdu) is a scientifically sound framework describing what it means for educators to be digitally competent. It provides a general reference frame to support the development of educator-specific digital competences in Europe.

This final report includes in the following 2 chapters the Guidelines (instructional design) and the Competence map.



Instructional design for VET digital facilitators. The 5E Model

From an academic perspective, instructional design is defined as “the systematic and reflective process of translating principles of learning and instruction into plans for instructional materials, activities, information resources, and evaluation.”¹ Evidently, the starting point of instructional design consists in the clarification of what students should learn (Norbert, Thomas, Patrick, & Oleg, 2017, p. 1). In other words, instructional design is creating learning or instructional experiences that facilitate the acquisition of new knowledge.

Instructional designers create and deliver educational and training materials to learners from all walks of life in a variety of ways. They work with traditional paper materials, such as handouts and manuals, as well as eLearning technologies and multimedia. Their work can be seen in elementary and secondary schools to universities and adult training facilities. They're also found outside the academic sector in a range of industries including health care, retail and the military.²

Instructional design in practice presupposes a specialised and highly applied knowledge. The knowledge needed for the design of effective learning environments not only contains knowledge about particular subject matters to be taught (i.e., content knowledge). To design effective instruction and/or learning environments one needs also to possess knowledge about various generic strategies and methods of instruction, diagnostics, testing, and assessment (i.e., general pedagogical knowledge). Last, there is the need for knowledge about didactical and diagnostic potentials of content specific tasks idiosyncratic experiences concerning useful forms of presentation and representation, an understanding of what makes a specific content easy or difficult to learn, as well as basic knowledge about preconceptions with which learners of different age and social background enter the learning environment (i.e., pedagogical content knowledge). (Norbert, Thomas, Patrick, & Oleg, 2017, p. 20)

There are numerous ID models that instructional designers can use as their foundation when developing various learning exercises. The five most common and widely used instructional design models are: Bloom’s taxonomy, ADDIE Model, Iterative Design, SAM Model, Learning Circle Framework. Instructional design practices calls for all instruction to include three primary components that form the Magic Triangle of Learning: (1) learning objectives – the goals are outcomes for the student and they should describe what the learner will be capable of at the end of a course, (2) learning activities – the actions which the instructional designer plans during the design phase. When creating both objectives and activities keep the learner in mind, (3) learning assessments – It is imperative that they are aligned with both the learning objectives and learning activities.³

Instructional design is most effective and learning outcomes are most successful when these three pillars are built with the “intention of interdependence,” or in a way that all three support each other. Using the theories of instructional design to build teaching exercises can elicit numerous positive benefits for learners: creates focused/customised programs, encourages more student participation, sets clear and measurable objectives, creates consistency, simplifies learning for students.

¹ University of Santiago, “What is instructional design?”. <https://onlinedegrees.sandiego.edu/what-is-instructional-design-examples/>

² Purdue University, “What is instructional design?”. <https://online.purdue.edu/blog/education/what-is-instructional-design>

³ Wengroff, J. (2019, 21 June), “What is the Magic Triangle: Aligning Learning Objectives, Training Activities and Assessment Methods”. <https://getsynapse.com/blog/what-is-the-magic-triangle-aligning-learning-objectives-training-activities-and-assessment-methods/>



The 5E Model has been used to help frame the sequence and organisation of programs, units, and lessons and consists of the following phases: engagement, exploration, explanation, elaboration, and evaluation. Each phase has a specific function and contributes to the trainer's coherent instruction and the students' formulating a better understanding of scientific and technological knowledge, attitudes, and skills.

This model was developed in 1987 by the Biological Sciences Curriculum Study and it promotes collaborative, active learning in which students work together to solve problems and investigate new concepts by asking questions, observing, analysing, and drawing conclusions. 5E instructional model moves from a traditional model of instruction to a next generation model of instruction:

Engage means that the trainer is not showing or telling the students what to do anymore. The activity should make connections between past and present learning experiences, expose prior conceptions, and organise students' thinking toward the learning outcomes of current activities.

Explore gives the students the opportunity to unpack problems, develop models or gather data. The trainer is not the one who gives, demonstrates or shows the model. During the exploration phase, students actively explore the new concept through concrete learning experiences.

The Explanation phase allows the students to think and understand how they did something. Now, it means digging deeply into where the question has been answered or the problem solved, and using evidence to support claims.

Elaborate step is less about reading, watching or introducing new ideas. The trainer lets the students make valuable connections: concept-to-self, concept-to-concept and concept-to-world connections that help tie anchor and investigative phenomena together.

Evaluate cannot simply mean vocabulary assessments or graded journals anymore; now it means reflecting critically on the investigative process, the hypothesis, and the anchor phenomena.

As it can be seen, the 5E Model is based on the constructivist theory of learning, which suggests that people construct knowledge and meaning from experiences. By understanding and reflecting on activities, students are able to reconcile new knowledge with previous ideas. This model allows educators to create a unique learning experience for students. Trainers who can incorporate instructional models like the 5E Model into their classrooms help students build a strong foundation of knowledge through active participation. In the classroom, constructivism requires educators to build inquiry, exploration, and assessment into their instructional approach. In many ways, this means the trainer plays the role of a facilitator, guiding students as they learn new concepts.

1. Engage

Purpose

The educator works in the first step of the learning cycle to gain an understanding of the previous experience of the students and recognizes any knowledge gaps. Fostering an interest in the upcoming topics and hooking the attention of children to that topic and subject is important.

To take the attention of the students to the teaching topic teachers may assign students to open questions or write down what they already know about the subject. This is also when the notion is presented for the first time to the learners.

Engagement part is the first and arguably the most important part of the 5E model. The main goal of this step is to catch students' attentions to the topic. In order for students to be more interested in the title, teacher should cover more than a single aspect of their students. There are different aspects that a teacher needs to take into consideration while teaching students such as the different backgrounds of students, also their tendencies to different topics. Though each student has their own interests, and in order to make them reach some outcomes, a teacher has to consider more than one aspect. Therefore, the main goal of the teacher should be to help as many as students reaching the required point.

Asking a question, defining a problem, showing a discrepant event, and acting out a problematic situation are all ways to engage the students and focus them on the instructional task. The teacher's role is to present the situation and identify the instructional task. The teacher also sets the rules and procedures for establishing the task. Successful engagement results in students being puzzled by, and actively motivated in, the learning activity. Here, the word "activity" refers to both mental and physical activity. For further implementation, teachers can use books and videos from reputable sites or sources, books that correlate to the concept, real-life pictures effective discussion, and brainstorming.





There are several ways to effectively engage students in a lesson. You might create or use an existing video, a book, or just pictures. Engaged students think in depth when teachers encourage effective questioning about the concept. Using students' prior knowledge through discussion, about everyday examples, might help them to understand or explore the concept.

Activities

In this digitalized education system teachers can prefer to use web 2.0 tools to draw the attention of all students to the topic, to take their attention and to provide reflection on the subject at the beginning of any training program, lecture or lesson. With a variety of voting/quiz/right false, yes-no, or free word or sentence options, the interest of the class and the level of readiness can be quickly measured. The results are shown to the group instantly so that they have instant information about the information, need and motivation degree on the subject in the group.

For example, if the word cloud activity is done, a short discussion is provided on the subject based on the most repetitive words. If short sentences related to the subject, concept or terms are requested, these will be shared with the class and a productive introduction will be made to the course through correct or false highlighting. If the test is done, the readiness of the class to the course can be seen together from the correct and incorrect answer rates given to the questions and the necessary level can be continued. The tools listed below can also be used as a means of measuring attention in the later stages of the lesson and as a means of repetition/reinforcement or reminder at the end. The most important benefit/feature of these tools is to get feedback from the whole group very quickly, to analyze and show it to the group. All tools can also be used in distant learning or webinars.

Mentimeter

Why mentimeter?

In a world of online teaching and distance learning, teachers are trying to keep students engaged and connected in new ways. Mentimeter is a perfect tool to increase classroom engagement, and to make sure that everyone's voice is heard. Mentimeter can be used as an engagement tool at the beginning of the lesson to see the readiness of the students and also to create formative assessments, spark discussions and test knowledge with fun quiz competitions. It can be used at all types of education and training with people from different age groups.

What to expect from the students?

Mentimeter enables students to engage them to the lesson using live polls, word clouds, quizzes, multiple-choice questions and more. It is also used to see the background of the students on the topic that is going to be taught. In order to join the mentimeter students do not need to download mentimeter app or have an account to join. It is interactive and one can join the event by writing the code. Since it is interactive the responses will immediately appear on screen as dynamic and colorful visuals, helping them better connect with the group.

Mentimeter step by step

1. Create an account on <https://www.mentimeter.com/>
2. Create a mentimeter quiz
3. Choose a question type and write your question
4. Write options and choose the correct option
5. Create a code
6. Share the code with the students and ask them to enter menti.com with that code.

Mentimeter features

- Easy to join
- No need to download the app or have an account
- Can be used in online and face to face
- Engaging and enjoyable
- Quick feedback

Wordwall

Why Wordwall?

Wordwall is a free online tool for creating learning activities. With Wordwall, teachers can enter the topic that they would like to cover in class into the Wordwall and receive a variety of ready-made, fully customisable activities such as quizzes, word games, maze chases and much more. Wordwall is designed to help teachers create an array of interactive and engaging class activities for students in person or online. This platform provides various templates for teachers to select from.

What to expect from the students?

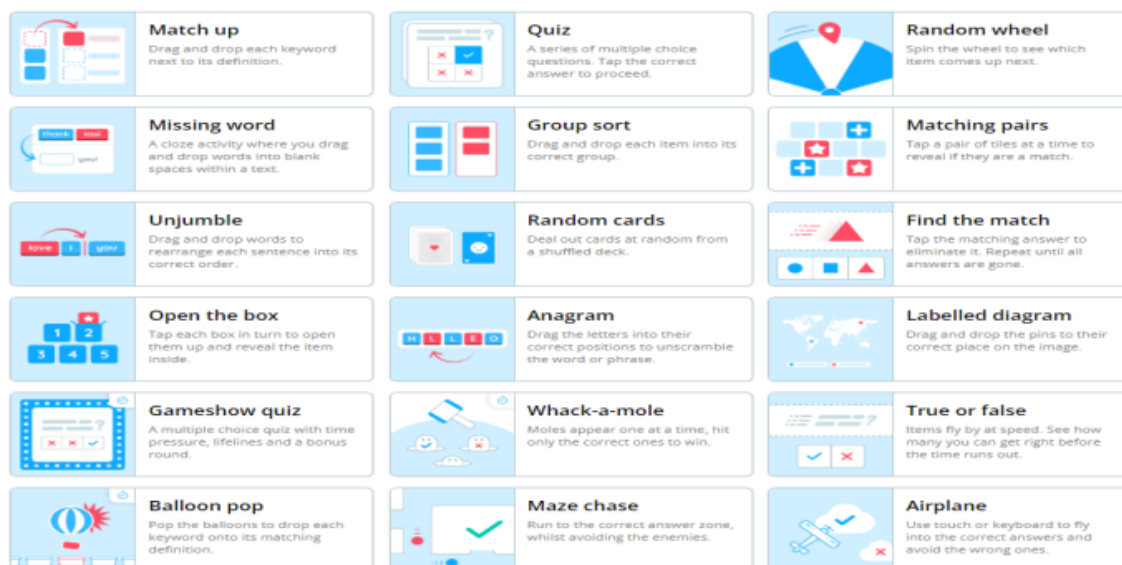
Even if the teachers or the students are not perfect in using technology it wouldn't take so much time to use it in the classroom. It is a perfect tool to engage students into the topic of the lesson with its ready made templates to create well-known activity types such as multiple choice, groupings, matching or more complex games and quizziz. Wordwall is web-based and with a good internet connection one can create activities quickly and easily in minutes and share in different ways.

Wordwall step by step

1. Create an account on the webpage <https://wordwall.net/>
2. Create a customized resource with just a few words and a few clicks.
3. Select a template due to your teaching topic or theme

Wordwall features

- Easy to use
- Just need a computer or tablet
- There are many templates to use and shareable





Plickers

Why Plickers?

Plickers is a simple web 2.0 tool that makes it easy to solve test-questions. While solving the questions you also have fun at the same time. While using Plickers you do not need to be in a computer lab or each student does not have to have a mobile phone or a tablet. It is a tool that every teacher can use in his classroom and that is why it is preferred so much. Plickers is an application that will make a difference in the classroom and ensure that your students participate in the class with pleasure. You can use plickers as an engaging and motivating tool at the very beginning of the lesson for engagement or as an evaluation tool at the end of the lesson. It also attracts the attention of the students who do not like to solve tests and participate in the lesson / activity.

Plickers is one of the tools that win the hearts of teachers with its features such as being used for every grade level, including primary school, not requiring many devices, instant viewing of results, practical use

What to expect from the students?

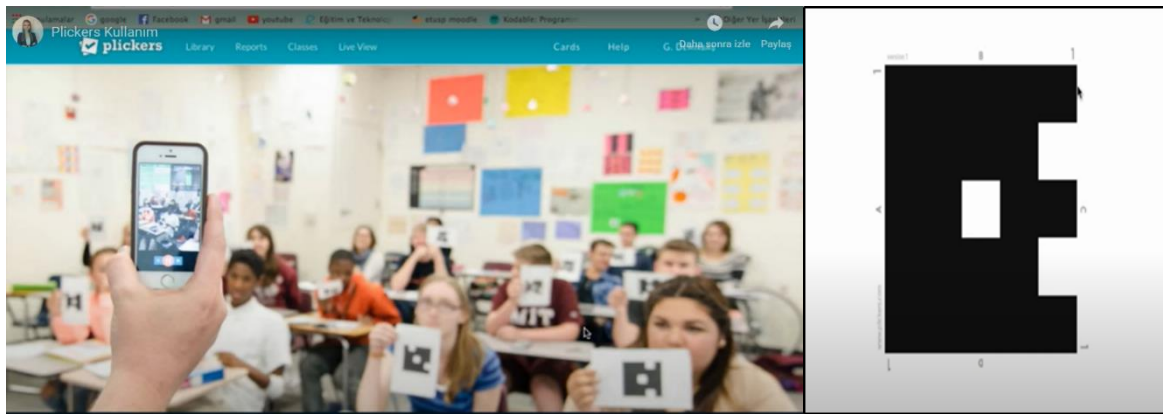
It is an engaging tool that increases motivation and competition in a way. While using this tool students do not have to have a tablet or a mobile phone or need internet. They only need to read the questions carefully and keep the printed QR codes sheets. These code sheets, which are very similar to each other, have a card number and 4 answer options. Whatever the answer is, the students show their papers so that it stays on that stylish top.

After the questions are prepared teachers distribute the cards to the students according to their names and start to apply. After downloading the Plickers app to your phone or tablet, you select the class. The questions you select from the questions assigned to that class will be displayed on the screen when the 'Live View' section of Plickers is selected on your teacher's computer. When students read the question and remove the correct answer, it will be reflected on this screen as you scan the QR codes with the camera of your phone or tablet, and the students will see if they answered correctly.

Plickers step by step

First you need to have an overview on Plickers and using Plickers in class

1. Have an account on Plickers <https://get.plickers.com/>
2. Add your classes and students
3. Create content by building set of questions
4. Print or purchase your plickers card
5. Open the Now Playing window
6. Open the Plickers app and start your quiz
7. Enter the scanner
8. Scan your students' answers
9. View instant results
10. Move on to your next question or end the session



Plickers features

Plickers allows teachers to check in on students understanding

It is a free, interactive tech tool that uses printable “paper clickers” instead of clicker devices

- With the data collected from the students at the engagement state teacher can direct his/her lesson plan and its content to the level of students’ readiness.
- Students stay engaged at the lesson as they watch to see if their card was scanned, and their answer displayed.
- The cards can either be bought online or downloaded and printed.

Blendspace

Why Blendspace?

Blendspace is a digital learning platform for teachers to access various resources and forge bundled and interactive lessons. It is the easiest way to blend your classroom with digital content. It is a free and collaborative web.2 tool which can be used to create interactive presentations, quizzes, worksheets, events, projects, discussion environments in a very short time. It can be used as an engagement tool at the beginning of the lesson to see the readiness of the students on the topic and to increase their motivation. It can be used as an evaluation tool at the end of the course. Teachers prepare digital contents that support in-class or out-of-class learning activities. Blendspace is compatible with mobile devices.

What to expect from the students?

Blendspace is a time saver tool. It avoids teachers and students from fumbling with flash drives, losing valuable class time, opening emails and attachments. It is a perfect tool to flip the classroom and to save that vital classroom time for student interactions, engaging activities, or having students work independently while teachers facilitate their activities and provide feedback one-on-one.

Blendspace step by step

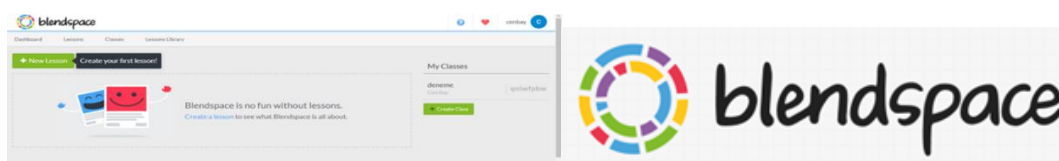
1. Create an account
2. Create an online session
3. Organize the settings –Choose a grade level for your students - Give your lesson a title
4. Organize the content
5. Drag&Drop Resources
6. Share the Lesson - Collaborate
7. Test the lesson

Blendspace features

- Avoids time consuming



- Interactive and collaborative
- Enjoyable



2. Explore

Purpose

Students consciously explore the new concept during the discovery process through concrete learning experiences. They may be asked to go through the scientific method and collaborate and make observations with their peers.

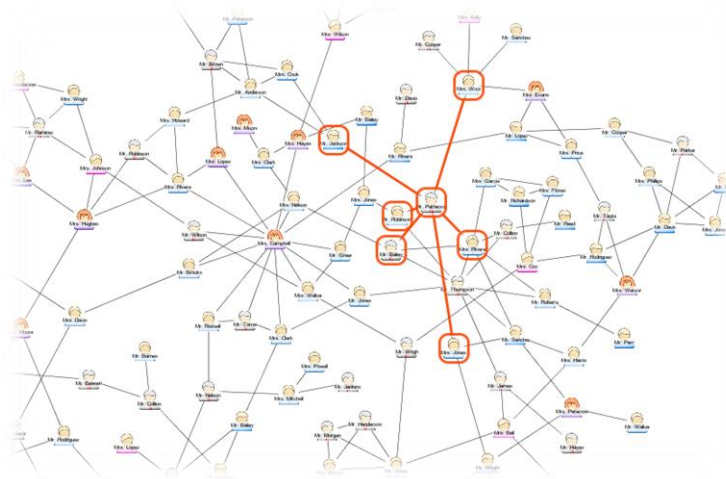
This stage enables learners to learn in a hands-on way.⁴



Exploration: Once the activities have engaged the students, the students have a psychological need for time to explore the ideas. Exploration activities are designed so that the students in the class have common, concrete experiences upon which they continue formulating concepts, processes, and skills. Engagement brings about disequilibrium; exploration initiates the process of equilibration. This phase should be concrete and hands on. Educational software can be used in the phase, but it should be carefully designed to assist the initial process of formulating adequate and scientifically accurate concepts. The aim of exploration activities is to establish experiences that teachers and students can use later on to formally introduce and discuss concepts, processes, or skills. During the activity, the students have time in which they can explore objects, events, or situations. As a result of their mental and physical involvement in the activity, the students establish relationships, observe patterns, identify variables, and question events. The teacher's role in the exploration phase is that of facilitator or coach. The teacher initiates the activity and allows the students time and opportunity to investigate objects, materials, and situations based on each student's own ideas of the phenomena. If called upon, the teacher may coach or guide students as they begin reconstructing their explanations. Use of tangible materials and concrete experiences is essential.⁵

⁴ <https://lesley.edu/article/empowering-students-the-5e-model-explained>

⁵ https://bscs.org/wp-content/uploads/2022/01/bscs_5e_full_report-1.pdf



Activities

Slatebox

Why Slatebox?

Slatebox is an online collaboration and drawing tool which delivers a simple mechanism for drawing, collaborating and sharing content. It is a perfect tool for explore stage of the 5E model.

It offers a variety of good-looking templates and intuitive tools for designing and editing mind maps and charts. Creating a mind map is a simple matter of selecting a template and using the visual editor to place text and images in boxes. Those boxes can be resized and rearranged using the drag and drop editor. If you need more text boxes, simply add more.

What to expect from the students?

Slatebox is an interactive tool to do brainstorming in the classroom. It can be used on the interactive whiteboard, too. When students plan a project or a diagram a concept teachers can offer Slatebox, it is a fast and responsive mind mapping tool. If you just want to create organization templates for your students to use offline, you can use Slatebox for that too. Create your template, download it as an image, and print it out.

Slatebox step by step

1. Registration is free for individual users of Slatebox.
2. You have the ability to create unlimited mind maps (“slates”) which can be private or public.
3. In order to save the slates do not forget to close the welcome screen so that you can access more of the menu.
4. Even with the individual option, you can collaborate with one person by sharing a provided link.
5. The premium versions of Slatebox will give you more flexibility as edits can be made and viewed in real-time by multiple collaborators.

Slatebox features

Slatebox can be used to implement a variety of instructional strategies:

- Brainstorm ideas
- Develop a course outline, learning module, or research project draft
- Develop story ideas or even develop a digital story
- Develop a mental model of a subject
- Map the steps of a procedure
- Map the relationships between elements of a process
- Illustrate organizational relationships
- Collaborate in real-time.

MindMeister

Why MindMeister?

Concept maps are individual learning tools. They are concrete graphs that indicate the connections of a single concept with the other concepts in the same category. It is used to make meaningful connections between one’s previous knowledge and the new gained information. It functions such as visualization, association, concretization, classification of information and also it can be used effectively in defining the scope of the new units to be learned, determining the readiness levels of the students, revealing and eliminating conceptual misconceptions and revealing how the students structure the information.

Mindmeister allows us to create very nice solutions and concept maps in 10-15 minutes with less effort. It is an online interactive tool that each participant can interfere, let others change the mind maps you create and also create online brainstorm. For example, by sharing the concept map we have created, you can direct your students to this service and create a common concept map. Thus, a product will emerge as a result of Student-Teacher work. Or we can divide them into project groups and enable our students to create a common concept map. You can also decide whether the people you invite can only view or edit your maps by them.



What to expect from the students?

It is a collaborative work in which student-student or student- teacher can collaborate. It is a perfect tool to see what the students already know about the topic of the lesson and to make connections with the topic that will be learned. Students of all ages can utilize MindMeister to study more efficiently, unleash their creative potential, and get ahead in their educational career.

MindMeister step by step

1. Visit www.mindmeister.com to access the MindMeister dashboard.
2. Click the plus icon (+) at the top of the dashboard to create a new mind map.
3. Double-click the central (root) topic in your mind map to name your map.
4. Press ENTER to create sibling topics.
5. Press TAB to create subtopics.

Mindmeister features

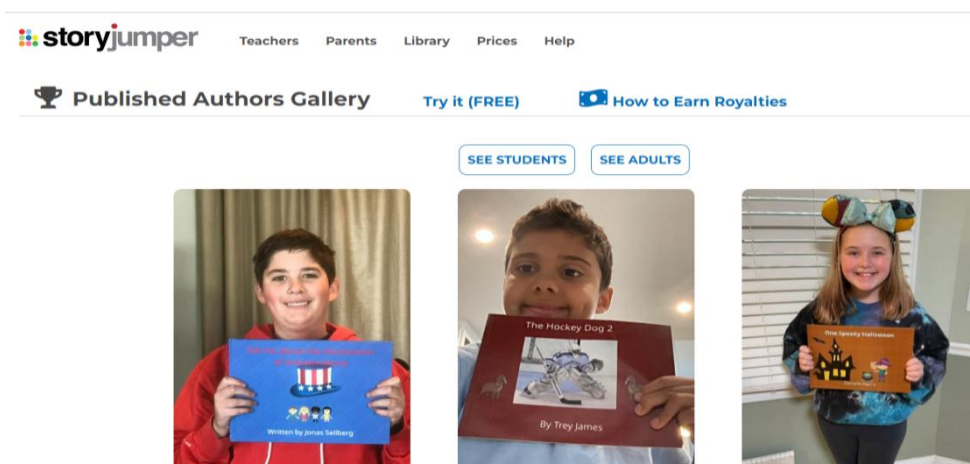
- Students can create their own mind maps including keywords, links, branches, and hierarchical levels to help them brainstorm ideas for essay writing.
- Maps can be shared with others for easy collaboration.
- Templates are provided to easily start a new mind map.
- Can be accessed easily in Teams and use SD72 Microsoft login to create accounts

Storyjumper

Why Storyjumper?

Storyjumper is an application where students at different levels, from preschool to higher education, can create digital storybooks individually or in groups. The application can be used for different purposes such as concept learning, authorship, creativity, development of collaborative working skills, story-based subject learning.

It is a platform that allows you to create digital stories through a website. Story Jumper offers a wide range of users and offers you fairytale-like environments, characters, objects and pictures to use in your stories. Thanks to this platform, you can edit your digital story as you want with the visuals on Story Jumper and transfer it to the reader. With Story Jumper, users can both publish their own stories and read other users' stories. The most important feature that distinguishes Story Jumper from other book creation tools is that the pages can be created with sound when you want. So you can create digital stories with sound on Story Jumper, which allows you to add voice-overs to your stories.



What to expect from the students?

With Story Jumper, users can add their own characters, their own environments and different voices to their digital stories created by using their imaginations. Users can share the digital stories created or read a shared story. If you're a teacher, you can create your own class and add students on Story Jumper. You can follow the stories your students have made and make corrections if you wish. By giving your students group or individual assignments, you can support the development of their imaginations. You can offer your students a draft digital book and direct them to improve it. It is an

amazing and engaging way of improving students digitalization and imagination at the same time. Also a perfect collaborative instrument to work in peers, in groups or in class. A good tool representing 21st Century Skills.

Storyjumper step by step

1. Visit www.storyjumper.com and sign up an account
2. Plan your lesson
3. Create a book
4. Add your classes
5. Add students or teachers
6. Students create books
7. Review the books
8. Publish books and share with the target group (parents-students-school manager and teachers)

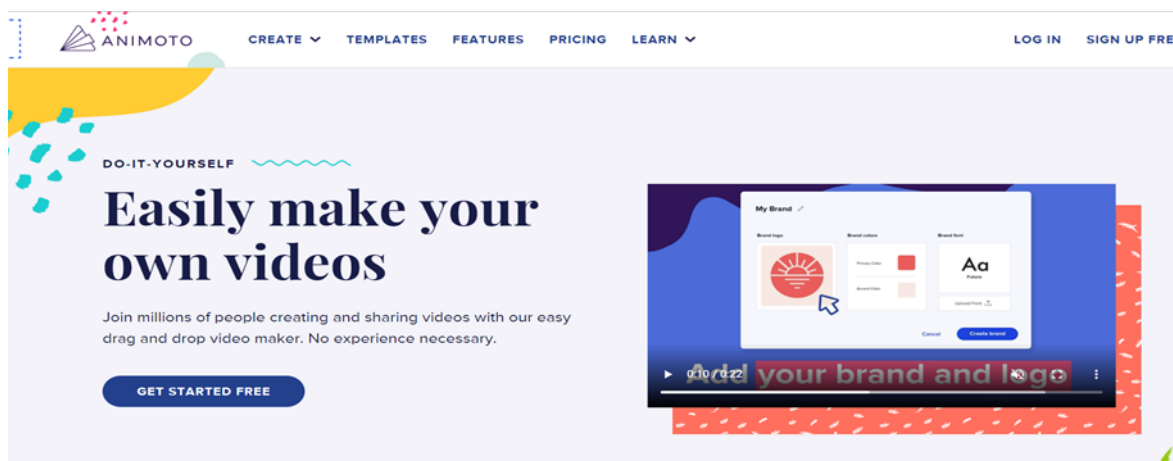
Storyjumper's features

- Brings authors and readers together who mutually support and encourage each other to create amazing new books
- Improves imagination and using digital tools
- Improves collaborative skills and writing skills
- A good way of process evaluation

Animoto

Why Animoto?

Animoto is a cloud-based video creation service that produces video from photos, video clips, and music into video slideshows, and customized web-based presentations. It is a Web 2.0 tool that allows users to produce videos that blend photos, video clips, text and music. Teachers can use Animoto in their classes by examining their existing curriculum to decide where the use of Animoto will support their learning objectives. It is a great choice for those who need to create videos on the fly. For someone who is complexly new to video and editing, this tool process is a major resource. No matter if you are casual user, professional, or need video editing for YouTube videos, Animoto can cover all needs.



What to expect from the students?

Students who are interested in the course can easily learn the learning topics with animoto. With the Animoto web 2.0 tool; teachers can remarkably share subheadings or important parts of the topic with their students when switching to a new topic or a new unit. With the Animoto web 2.0 applications, you can prepare it in advance to use during the lecture and use it to explain the crucial parts of the subject. In this way, the most important parts of the subject are permanently learned.



With the Animoto web 2.0 applications, teachers can process their lesson more efficiently with interactive materials by creating their course streaming video. With Animoto web 2.0, teachers can ensure that the students learn permanently by repeating the important points of the subject at the end of the lessons. For project and performance assignments, teachers can ask their students to do it from the Animoto app. Thus, the students; By using their interest in technology, teacher can allow them to have a more fun homework process for them, help develop their creative abilities, and make your students experience the happiness of having produced something.

Animoto step by step

1. Visit to <https://animoto.com/> and create your account. It is easy and Quick
2. Select a templates or start from scratch
3. Add images and video clips, either by uploading your own or browsing our Getty Images stock library.
4. Create videos using photos and video clips from your phone, camera, Facebook, and more. Choose from over 70 unique video styles
5. Caption photos, trim video clips, add text
6. Easily share on any social media account

Animoto's features

- Independent, active learning.
- Differentiated instruction.
- Real-world applications
- Student engagement.
- Peer collaboration.

3. Explain

Purpose

The 5E's Model Explain phase focuses on allowing students to synthesise the new acquired knowledge and ask questions if more clarity is needed. This is a process led by trainers, they should ask students to share what they learned during the Explore process for the Explain phase to be successful before presenting technical knowledge in a more direct way. This is often when educators use video materials, applications for computers, or other aids to improve comprehension.

The explanation phase is an essential, minds-on part of the 5E Model. The explanation phase enables students to describe their understanding and ideas and pose questions about the concepts they have been exploring. Before the educator attempts to provide a deeper explanation, the students must first have the opportunity to express their own explanations and ideas.⁶



Source: Femxa

Therefore, the Explanation phase has two differentiated and consecutive parts. During the first part students have a distinctive opportunity to articulate their own understanding of the concepts encountered during the lesson cycle thus far. The educator must be a facilitator and asks and guides students through their explanations of the concepts gained during prior phases. During the second part, the teacher helps focus students' attention on a particular aspect of their exploration experiences by providing scientific explanations, introducing important vocabulary, or discussing and clarifying misconceptions. Formal definitions, notes, and labels are provided. The teacher may also decide to integrate videos, or other visual aides to help with student understanding.⁷

⁶ Ballone Duran, et al., 2004, p. 49

⁷ Duran, et al., 2011, p. 57



The explain phase allows educators to help students organise the new knowledge acquired during exploration, as well as provide them with technical and more advanced concepts and ideas to build on the students' knowledge. It is important to provide students with an opportunity to organise their knowledge in a way that facilitates acquisition of new knowledge and skills, and the ability to later apply the lessons learned. When students are given an organisational structure which fits new knowledge, they learn more effectively than when they are left to infer this conceptual structure by themselves.⁸

Activities

Popplet⁹

Why Popplet?

Popplet is an online tool that offers a digital platform to collaboratively create graphics – synchronously or asynchronously - and to organise our ideas, resources, images, etc. It has multiple functions as we can create virtual walls, concept maps, compilation of resources, timelines, etc. with a visually clear and attractive result. The tool allows users to capture facts, thoughts and images and create relationships between them. Popplet allows students to elaborate visual representations of the knowledge and interconnected concepts they have learned, and educators can use it as a tool to help students better comprehend new knowledge.¹⁰

What to expect from your students?

Popplet helps students develop a framework for organising their knowledge about a subject by providing visuals and key vocabulary words. At the same time, it can be used as a pre-lesson strategy by inviting students to share what they already know about a particular concept. After or during the development of the lessons, teachers should ask students to help add to the map as a group. This provides a visual aid for building upon their prior knowledge with the new acquired information. Popplet can be a useful resource to help students:

- Model how to identify the major ideas or concepts in a text, publication, or lesson.
- Organise their ideas and knowledge in categories, timelines, etc. And include links to resources as they discover more about a specific subject.
- Mapping of concepts constitutes a visual aid to represent and reflect the different interconnections between ideas and concepts.

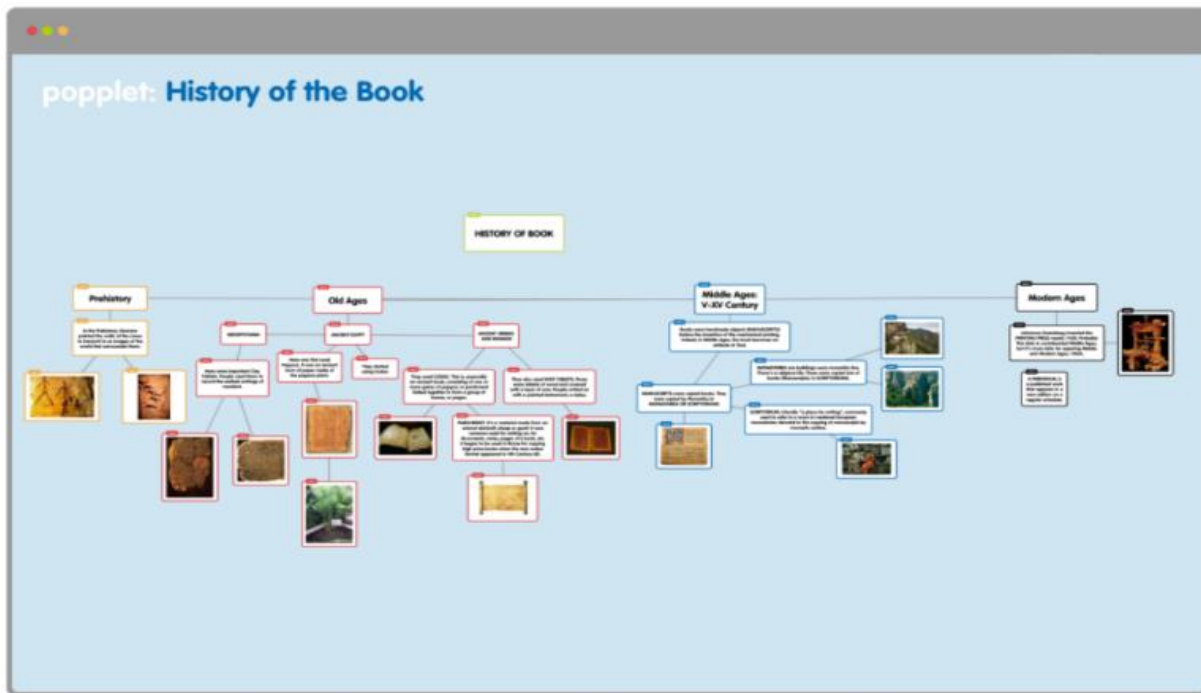
Popplet step by step

1. Create an account.
2. Make a new popplet with a Title and a colour and start adding bubbles or “popples”.
3. Add users to work collaboratively. There are different strokes, and options to add content.
4. Export and share your popplet.

⁸ Ruíz-Martín, et all, 2022.

⁹ Popplet. Retrieved from: <https://www.popplet.com/>

¹⁰ Arrausi, J.; Ribosa Martínez, J.. «Driving maps: El uso de mapas mentales para orientar el Aprendizaje Basado en Proyectos a través del Design thinking». Gráfica, 2018, Vol. 6, no 11, pp. 25.



Source: Popplet

Popplet's features

- It is structured in the form of a desktop in which we can create bubbles, “popplets”, in which text, strokes, images, maps, videos and more can be introduced.
- It allows collaborative use in real-time.
- It is available in over 100+ languages.

Editable online KWL Grid¹¹

Why Editable online KWL grid?

A KWL grid is a simple visual learning tool that can be filled prior, during and after learning in a new topic or theme to show: What is already known (K), What would like to be known (W) and What has been learnt (L). Children and adults can use this as a working document and share it through collaborative online tools to discuss the subjects with the class or exchange notes with other students.

KWL charts are designed to encourage reading or guide a learning session. This resource can be used as an online resource or in a paper, and it is especially useful for distance learning as it helps to refresh your knowledge about a certain topic or identify knowledge gaps in an easy organised way.

What to expect from your students?

KWL grids allow students to activate prior knowledge, develop a purpose for learning through interests and summarise what they have learned. This allows students to compare new knowledge with what they already know to construct meaning from what they've been learning. This allows them to monitor their learning and identify any knowledge gaps.

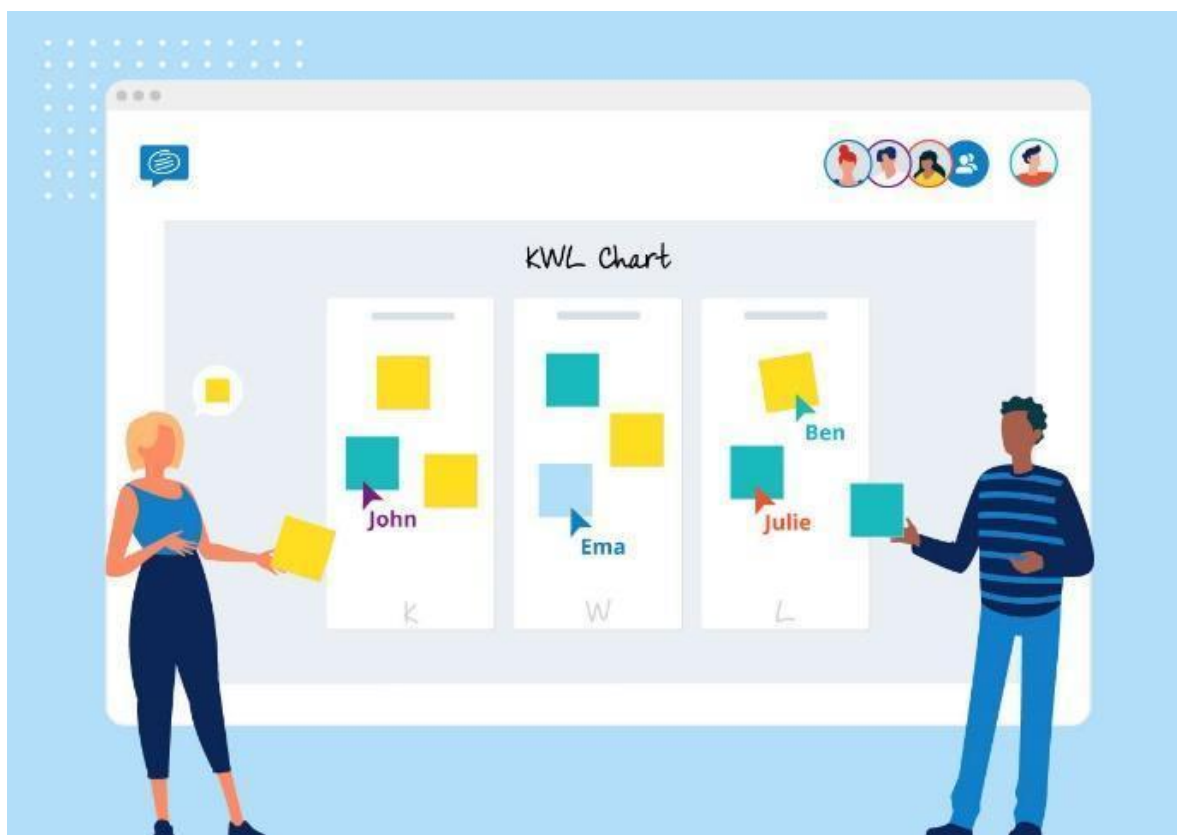
¹¹ Twinkl. Retrieved from: <https://www.twinkl.es/resource/t-c-6811-editable-kwl-grid>

By taking notes during each stage of the learning process (current knowledge, questions or areas of interest, and learnings), KWL grids help teachers tailor their lessons to what the students feel like they need to know. Not only does this ensure students are not left with knowledge gaps, but it also makes students feel involved with the learning process.

Editable online KWL grid step by step

1. Download a customizable KWL grid template that adapts to the objectives of your subject. You can download free templates available in multiple languages in platforms such as [Twinkl](#)
2. Give clear instructions for students to individually or collaboratively (e.g., using an online collaborative tool such as Blackboard) fill each field.
3. Collect the grids and use the information to design your lessons around students' knowledge, gaps and misconceptions; or to initiate a discussion between students.

Editable online KWL grid's features



Source: Twinkl

- Allows students to organise their knowledge around a specific subject, their gaps, and to determine their own learning objectives.
- It can be used collaboratively, thus allowing students to compare and exchange their notes.
- It can be customizable to fit each class and subject specific needs, for the information collected to be more useful for both teachers and students.



Playposit¹²

Why Playposit?

Playposit is an application for creating interactive videos, either selected from YouTube or another platform, or using one of your own, and enriching it with activities, images or comments, establishing a series of pauses during its duration for students to solve, investigate or reflect on it. It allows students to enrich the learning process of students by extending and/or consolidating their knowledge in an iterative and fun way. Playposit is an example of a digital tool that allows educators to develop flipped classroom strategies, that is, a teaching method where students become the protagonists of their learning.

What to expect from your students?

Playposit is an intuitive and easy to use tool that, with fewer digital skills, allows educators to create powerful learning resources for students, tailor to the learning objectives and to the diversity of needs of the group of students. Its benefits include the following:

- Promotes deeper and more meaningful learning.
- It favours the development of competences and consolidates knowledge through individual and interactive work.
- It motivates students.

Students will be able to develop their critical thinking and problem-solving skills through the solutions of the different questions. The application helps students to focus on the content and consolidates it by resolving the multiple questions that educators add to the videos. It also allows comments and links to external resources during key moments of the video, that students can access to deepen their knowledge in the subject or resolve their doubts.

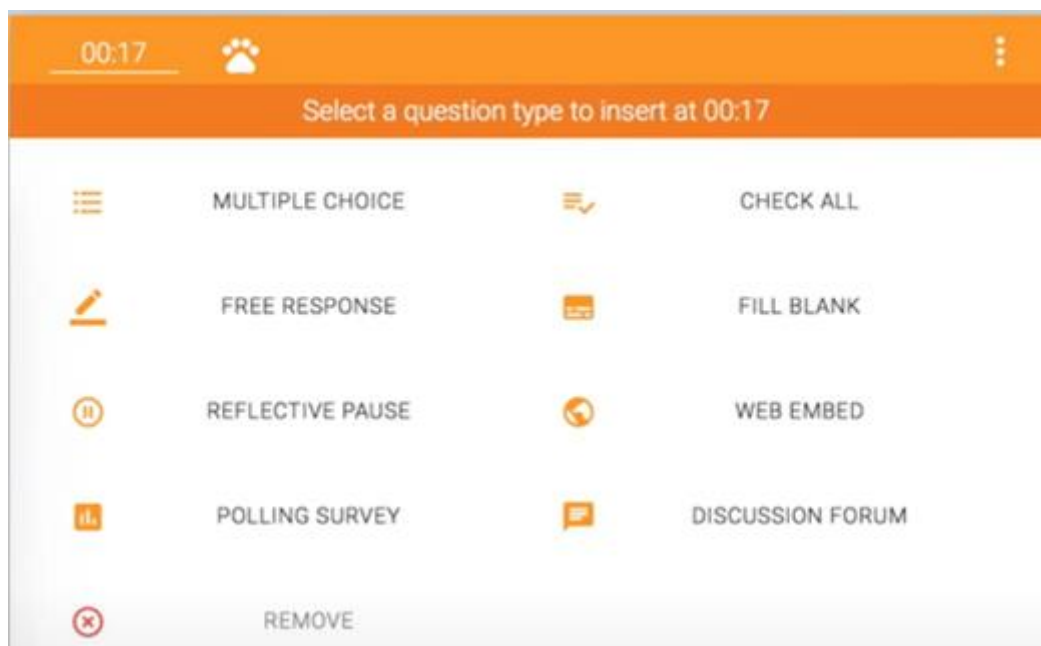
Playposit step by step

1. Create an account with the classroom profile.
2. Create an activity by uploading a video and editing it. Multiple types of questions, pauses, and comments can be added.
3. Invite students to register. Students will have to create their profile and access the classroom content by introducing the code number visible in the classroom profile.
4. Set up deadlines to complete the video lessons by students and monitor their progress. The teacher can keep track of what each student has answered.

Playposit's features

- Edit interactive videos for students. Educators can upload videos to include multiple types or questions: multiple choice, fill blank, short responses, etc. They can also add comments, insert reflexive pauses or and links to other online resources.
- Students can rewind the videos if they need to watch a part they did not understand again.
- Playposit allows you to monitor students' results. Educators can check the results for each student and the time needed to answer it. It is possible to view graphics of the responses and, thus detect if a question is too complicated or poorly explained.
- There is a chat option that allows students to interact between each other while performing the tasks, as well as with the teacher. This allows to extend the conversation when doubts arise or in order to continue the discussion on an issue and go deeper into it.

¹² Playposit. Retrieved from <https://go.playposit.com/>



Source: YouTube

*Wooclap*¹³

Why Wooclap?

Wooclap is a digital tool to create interactive and visually attractive presentations that allows students to participate in the lessons and teachers to view students' responses. With this application teachers can create presentations or upload their already created ones with PowerPoint or Google Slides and include activities so that they can make students active participants in the lessons, such as surveys, quizzes and more. Students can answer in real-time through any device, including their smartphones, tablets or PCs, and educators will be able to see their responses immediately and use these data to adjust their lessons when necessary.

What to expect from your students?

Introducing interactive activities for students as part of educators' presentations will help to maintain students' focus on the subject being explained. The presentations will be instantly more attractive for listeners both in synchronous and asynchronous lessons. The main benefits of this digital tool are:

- Boost lectures, seminars and conferences.
- Measure the understanding of your learners.
- Stimulate participation and motivate your audience.
- Improve learning and collaboration.

Wooclap step by step

1. Register in Wooclap
2. Create or upload a presentation.
3. Edit the presentation. Educators can include questions, quizzes, and more features to allow students to participate in other ways. There are tutorials available in the same app to guide you through the different possibilities.
4. Save the presentation and use it in your lessons. You can also use it asynchronously by choosing the features that are compatible with this option.

¹³ Wooclap. Retrieved from: <https://www.wooclap.com/>



Source: Wooclap

Wooclap's features

- Multiple question types to assess the level of understanding of participants, to give your participants the floor, to develop a brainstorming, to develop a competition, and more.
- Anonymous or authenticated participation (with username), to adapt to your audience.
- The answers of participants can be shown in real time to just the teacher or all the audience.
- Students can choose to make questions, like the questions of their peers or respond to them from their devices in real-time.
- The Confuse feature allows students to show they are not following, and the educators can use the data to deepen in an explanation.

Pocket¹⁴

Why Pocket?

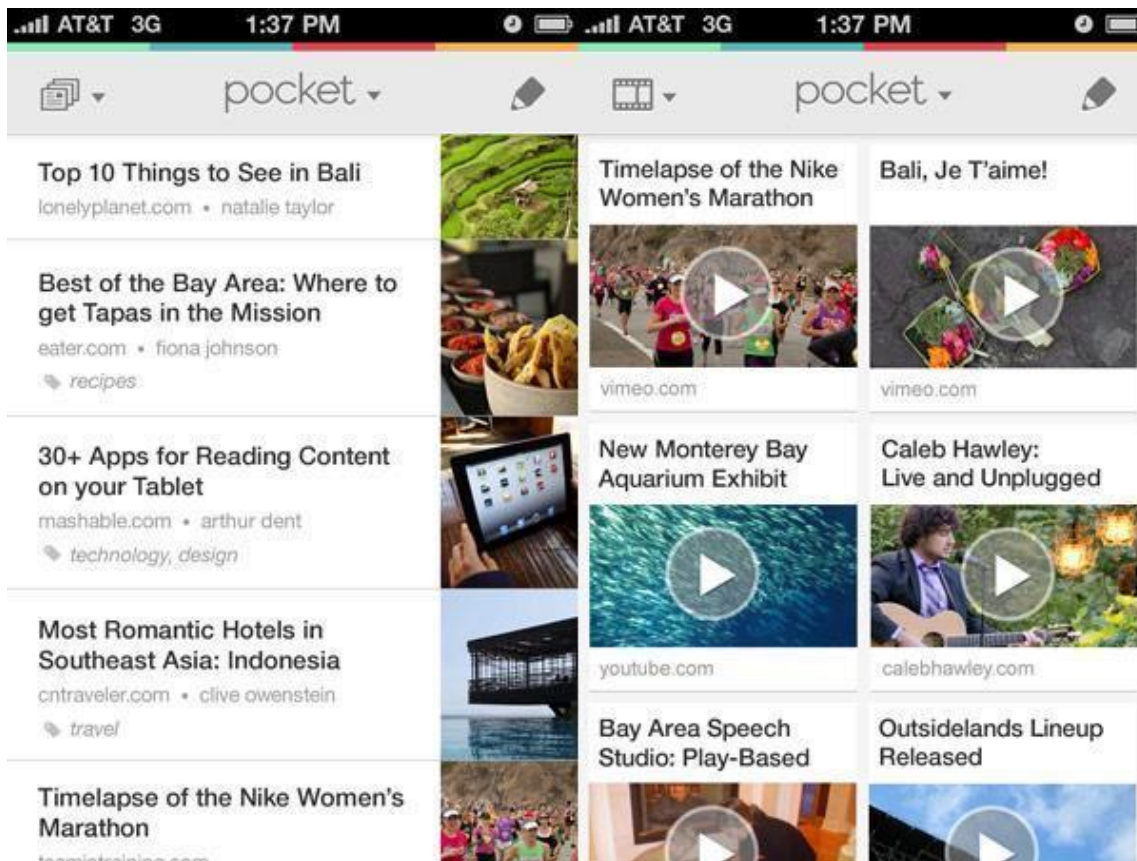
Pocket is a digital storage tool that allows you to save information offline that you later can review even if you do not have an internet connection. It also allows you to sort the information saved, and it can be accessed by any device. Teachers and students can both benefit from this platform by organising materials for the classroom or interesting websites' posts, videos, or online articles about a specific subject that can be visited later without connection, to study or work on a project.

What to expect from your students?

Students will be able to easily save the resources searched in their independent research, and to have access to organise resources about specific subjects provided by educators. Pocket allows to save and organise multiple types of content found online; this will provide students with:

- A safe and accessible way to save online resources.
- An easy to use and visually attractive storage application, fostering consulting and reading of useful content.
- Provide clarity and organisation of educational resources through categorization.

¹⁴ Pocket. Retrieved from: <https://getpocket.com/es/>



Source: IOSxtreme

Pocket step by step

1. Create an account. Compatible with PC (extension), smartphone or tablet.
2. Start to save online resources in your account and organise it by categories.
3. Access pocket to revisit the online content saved and to edit your categories.
4. Create a public profile to share your saved resources with students.

Pocket's features

- Storage for videos, articles, websites, photos and anything found online.
- Organisation and visual categorization of the resources.
- Save your Favourites.
- Multiple reading options and the "Text to speech" option, to listen to articles.
- Easy access from any device with and without internet connection.
- Possibility to synchronise your different devices, so you would have the information saved in all of them.

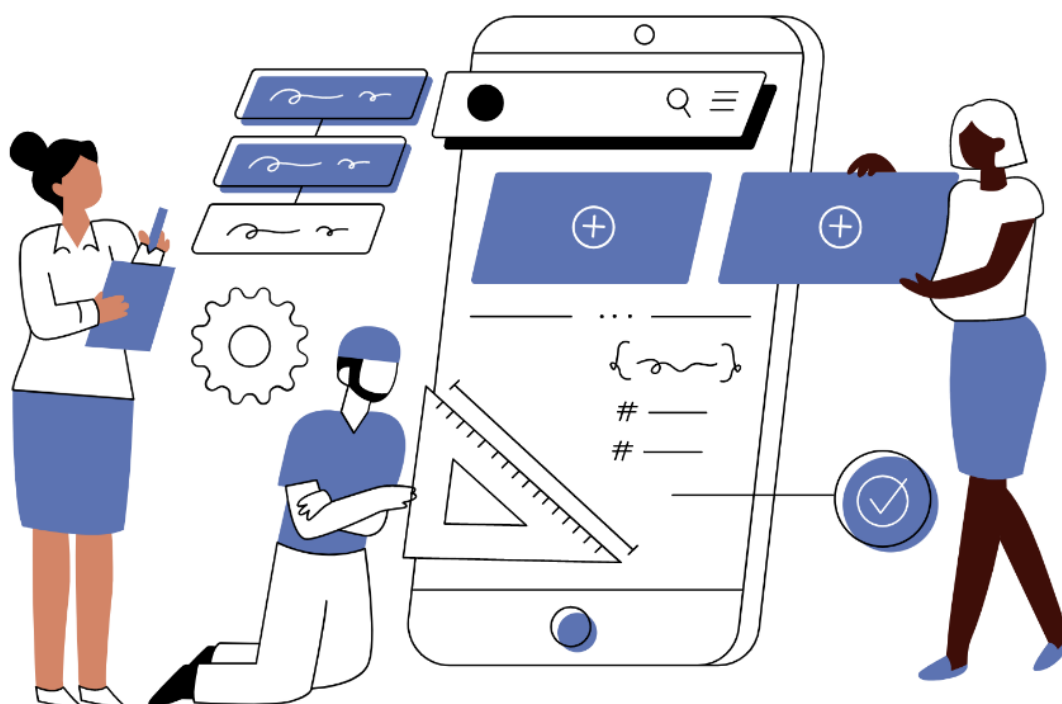
4. Elaborate

Purpose

The 5E Model's elaboration process focuses on giving students room to apply what they have learned. It enables them to develop a deeper understanding. To strengthen new skills, trainers can ask students to build presentations or perform additional investigations.

Before evaluation, this stage helps students to consolidate their skills. The exploration phase, meanwhile, allows the students' pre-instructional views to be tested. Based on their exploration in the second phase, students develop a plausible explanation for the phenomenon, with guidance from the trainers. The elaboration phase provides extension activities that enable students to reinforce and use the new knowledge acquired. This phase is characterized by the applications and extension of the concepts learned and skills acquired through conducting new, novel, or additional activities. Essentially, the elaboration phase provides activities for students to apply, develop, extend, or reinforce the newly constructed knowledge and acquired skills (Eng, et al., 2021, p. 173).

In the elaborate stage, students are given experiences to apply their knowledge to new contexts. In other words, the fourth phase, elaborate, seeks to extend and challenge students understanding of the content they have learned in the previous three phases. Students work through additional activities to develop an even broader and deeper understanding of the content. Students should also directly apply what they learned in the explain phase in a new way (Zackary, 2019, p. 29).



Source: Canva

To better understand, here it is a stimulation for the elaboration stage of the 5E model. Let's suppose that there is a lesson with and its topic is derivation of the formula for the total surface area of a right circular cone. In the elaborate stage students should apply their gained knowledge by solving several textbook examples calculating the total surface area of right circular cones in pairs (Schallert, Lavicza, & Vandervieren, 2020, p. 11).



During the stage of explanation, learners should articulate their findings, supported by their trainers, who might help learners to find appropriate terms or concepts. Two further essential inquiry features which involve students trying to link their explanation to scientific knowledge as well as communicate and justify explanations could be addressed in the explanation phase. The elaboration phase aims to involve students in additional activities facilitating the transfer to closely related but new situations to generalize concepts, processes or skills. By applying what students have learned during elaboration, students might give priority to evidence in response to questions and formulate explanations from evidence (Schallert, Lavicza, & Vandervieren, 2020, p. 4).

Activities

*Kialo Edu*¹⁵

Why Kialo Edu

Kialo Edu, or „how to have a classroom debate online”, is the world’s largest argument mapping and debate site, specifically designed for classroom use. Its clear, visually compelling format makes it easy to follow the logical structure of a discussion and facilitates thoughtful collaboration. Kialo’s mission is to promote well-reasoned discussion online, and to that end, it is free for educators to use.

What to expect from your students

With clear visualization of arguments and with powerful, easy to use navigation tools, Kialo is the perfect resource to help students’ master critical thinking and reasoning skills. The students have the opportunity to put their knowledge into action, to demonstrate their understanding and to engage constructively each other.

Kialo is a public discussion platform designed to facilitate reasoned debates about complex topics online. Kialo Edu allows educators to curate spaces for students to work through complex subjects together, while giving students the space to ask questions, discuss, and evaluate new ideas. Many academics see Kialo as a solution to the many issues existing in online discourse today.

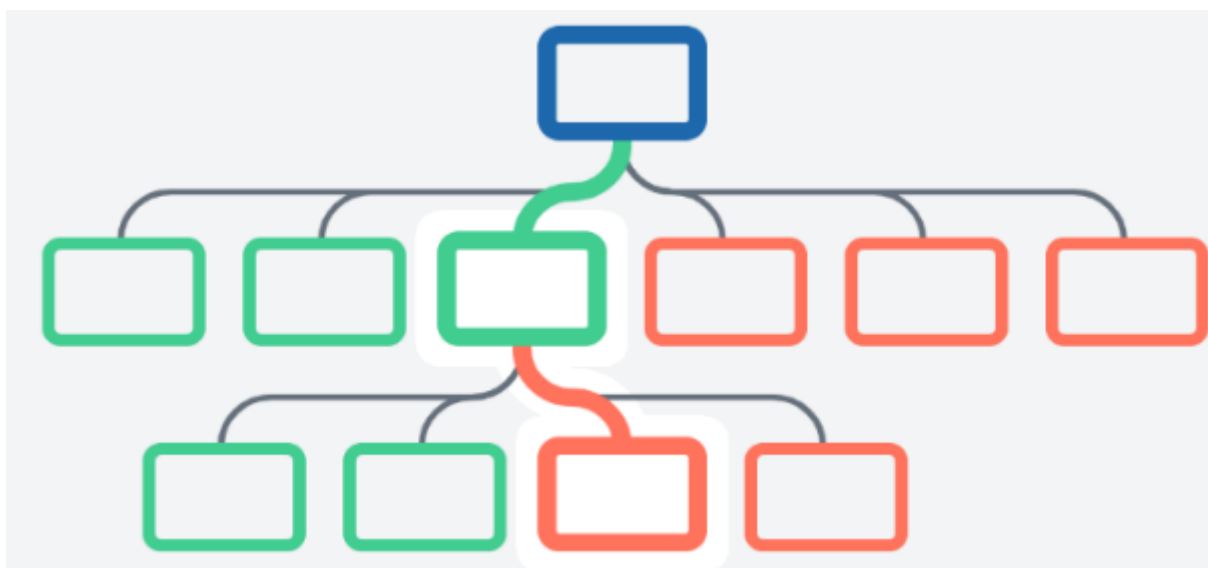
Kialo Edu step by step

1. Create an account.
2. Invite students: Click on “Teams” – “New Team” – “Name the team” – “Create” – add members by email or sending a link
3. Set up a debate. Click on “Create discussion” and follow the instructions.
4. Assign the discussion to your students.

Kialo’s features

- There can be added a super link to support the given arguments;
- The students can also vote other students’ arguments. The results of the voting are visible;
- The students can ask for review;
- The trainer can chat directly with the student;
- The platform offers lesson plans specially made for the trainers;
- Kialo has a discussion tree that is a graphical representation of the debate;
- The trainer can filter the data from their students (e.g. if the trainer wants to follow the progress of a specific student).

¹⁵ Kialo Edu. Retrieved from <https://www.kialo-edu.com/tour>



Source: Kialo

This image depicts the discussion tree of the debate. The blue rectangle is the main idea, the debate topic that was chosen by the trainer. The green rectangles represent the pros and the red ones represent the cons.

*Nearpod*¹⁶

Why Nearpod

Nearpod is a dynamic student engagement platform with loads of pre-created that the trainer can use with their students. With Nearpod, the trainer can add formative assessments directly into their lesson to drive student engagement. The trainer can start with a resource they already have, or check out the standards-aligned, pre-made lessons. He can get real-time insights into what students know, and access reports after their lesson.

What to expect from your students

A survey of over 2,100 students gives Nearpod high marks on personalization, creativity, and collaboration. The survey reveals that: 89% of students rated Nearpod activities as appropriately challenging. 82% of students feel that they can express themselves creatively using Nearpod, and 42% of students feel that Nearpod allows them to express themselves creatively to a greater extent than other classroom activities. 82% of students feel accountable for the work they do during Nearpod activities, and 50% of students say they participate more when using Nearpod. 73% of students say that during Nearpod activities, they interact with other students in a way that helps them learn.

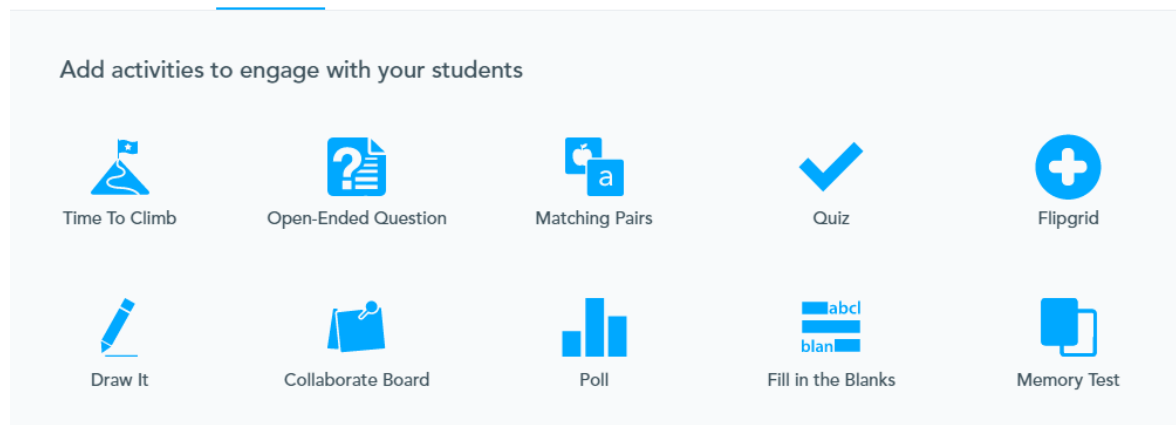
Nearpod step by step

1. Create an account.
2. Create a lesson (in Google Slides or choose one of their formats).
3. Create activities based on your lesson.

Nearpod's features

The trainer can choose from a variety of exercises, such as:

¹⁶ Nearpod. Retrieved from <https://nearpod.com/>

Content **Activities**

Source: Nearpod

- The trainer can gather data on student understanding by adding formative assessments, simulations, and dynamic media.
- The trainer can add Nearpod to their existing Power Points, Google Slides, worksheets, videos etc.
- The trainer can choose from thousands of ready-to-teach, customizable, standards-aligned lessons

What is more, even if there are a lot of free features, for some extra ones they must be paid.

Flipgrid

Why Flipgrid

Flipgrid is a dynamic platform where students can access content and then respond to prompts by creating short videos. The idea behind this education tool is to use video to create an open platform of discussion and learning that doesn't require a physical classroom to get everyone involved. That makes Flipgrid an ideal remote learning tool as well as a powerful homework-based application for students to use with each other.¹⁷

What to expect from your students

This tool has features that trainers in any subject can use to help students connect with each other and share their learning. Once a student creates a video, the rest of the class is able to view and respond to that video. What is more, Flipgrid can be a catch-up solution for students who are absent.

Flipgrid step by step

1. Create an account.
2. Create a classroom: Click on "Let's make a grid".
3. Create an assignment (give the title, select the time, give the instructions and add media resources).

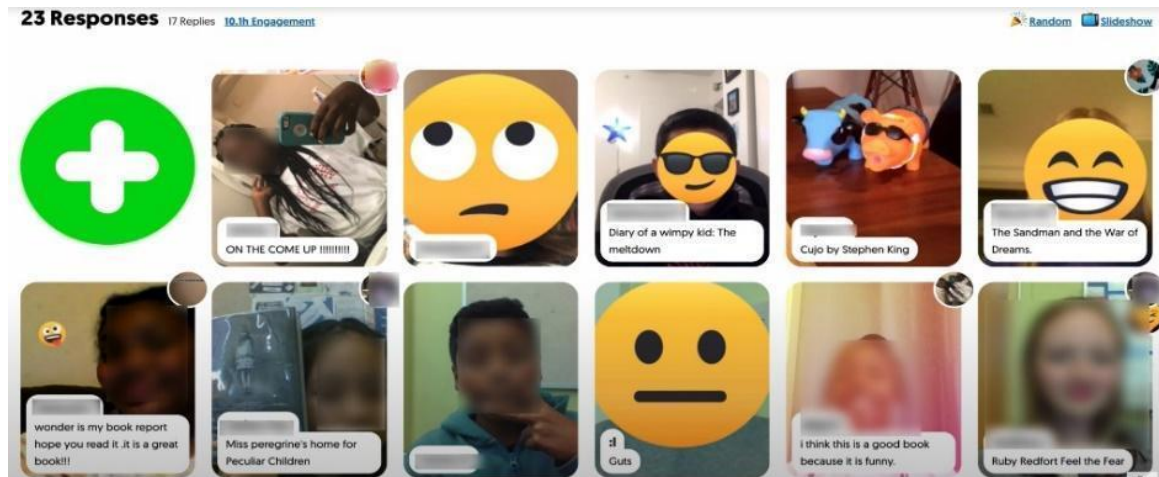
Flip grid's features¹⁸

- Students can access Flipgrid from a computer, a tablet or a mobile device.
- The trainer can add a co-trainer (Click on "Add Copilot").
- The trainer can access pre-created assignments (Click on "Disco Library").
- The trainer can see the replies that other students posted to each other.

¹⁷ What is Flipgrid and How Does it Work for Teachers and Students?. Retrieved from <https://www.techlearning.com/how-to/what-is-flipgrid-and-how-does-it-work-for-teachers-and-students>

¹⁸ Flipgrid Tutorial for Teachers. Retrieved from <https://www.youtube.com/watch?v=aLzX13iw7bw>

- The trainer can provide private feedback (video or written).
- When creating an assignment, the trainer can select the duration of the video.
- The video editor can be used as a board.
- The trainer has a section called “Topic Tip” where they can add tips to help his students in order to give the best answers.
- The trainer can see the hours engagement of his students.
- Each video consists of a thumbnail (it can be a selfie).
- The video can be edited (add filter, sticky notes, text, stickers).
- If a student doesn’t feel comfortable recording themselves, they can pixilate their video.



Source: YouTube

Actively Learn

Why Actively Learn¹⁹

Actively Learn is an award-winning digital curriculum that drives student engagement and equity through deeper learning. Its flexible features and comprehensive, standards-aligned resources empower trainers to deepen students’ comprehension. Actively Learn allows the trainers to make any video, webpage or text into an interactive learning experience. With Actively Learn, trainers everywhere can help every student achieve deeper learning, improve literacy, and grow.

What to expect from your students

The founders of the app focused on creating an academic program that would promote students’ ability to think critically and to reason about complex questions, all in a learning environment where they would be happy and motivated to learn.

Actively Learn step by step

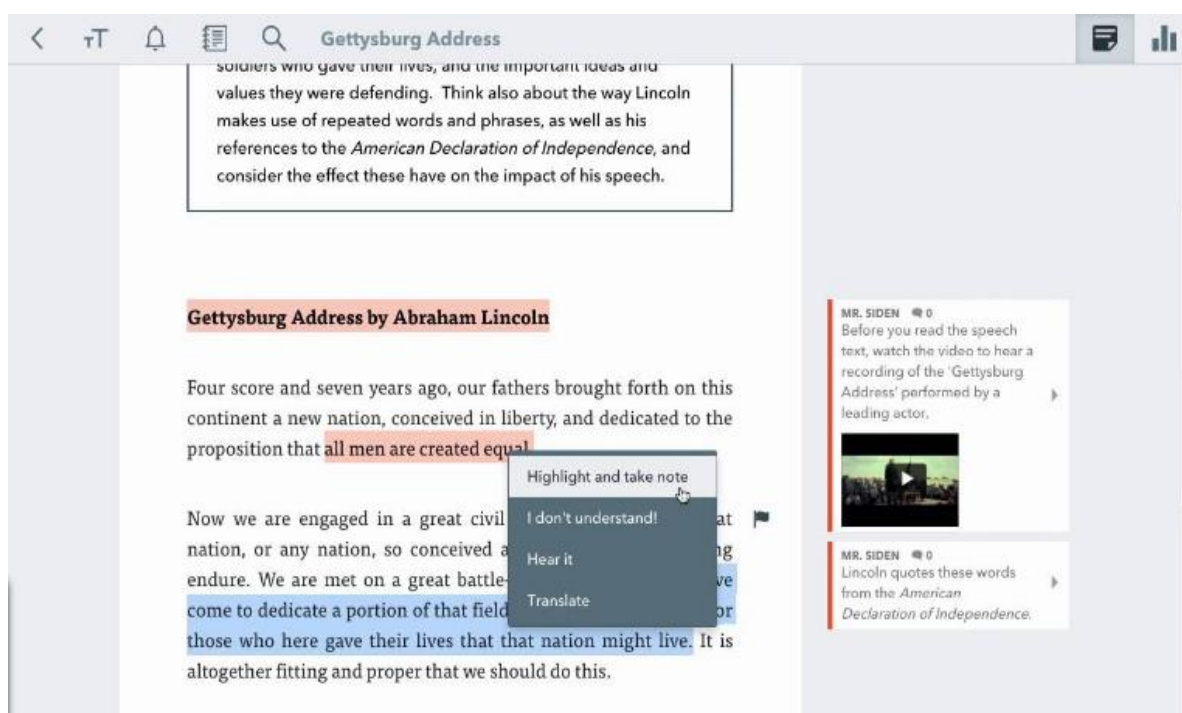
1. Create an account.
2. Set up classes: Click on the + sign next to the *Classes*.
3. Set up assignments (into ELA, Social Studies and Science).
4. Import (an Internet article, a video, a Doc, PDF, Slides).
5. Create quiz (click in *Insert questions* and choose: *short answer, multiple choice or poll*).
6. Assign: click *Assign*.

Actively Learn’s features

- When creating a class, the trainer can import it from Google Classroom or start a new one.

¹⁹ About us. Retrieved from <https://www.activelylearn.com/about-us>

- Sync the class with other platform (Google Classroom, Canvas)
- The trainer has access to pre-created interactive content.
- The trainer can see how the platform looks from his students` perspective.
- The trainer can make any type of content an interactive text.
- Students can define word, translate sentences, and hear text spoken aloud.
- Students can see how their peers responded after submitting their own answer.
- The students can respond to their trainer`s notes.
- Students can highlight any word from the text and add notes.
- There can be added a relevant link to some parts of the text.
- The students can't scroll past the question and must answer in order to continue reading.
- When the students choose an answer, they will immediately know if they got it correct or not.
- There are highlighted words and if someone clicks on them, then he can see a note that the trainer left for him.



Source: YouTube

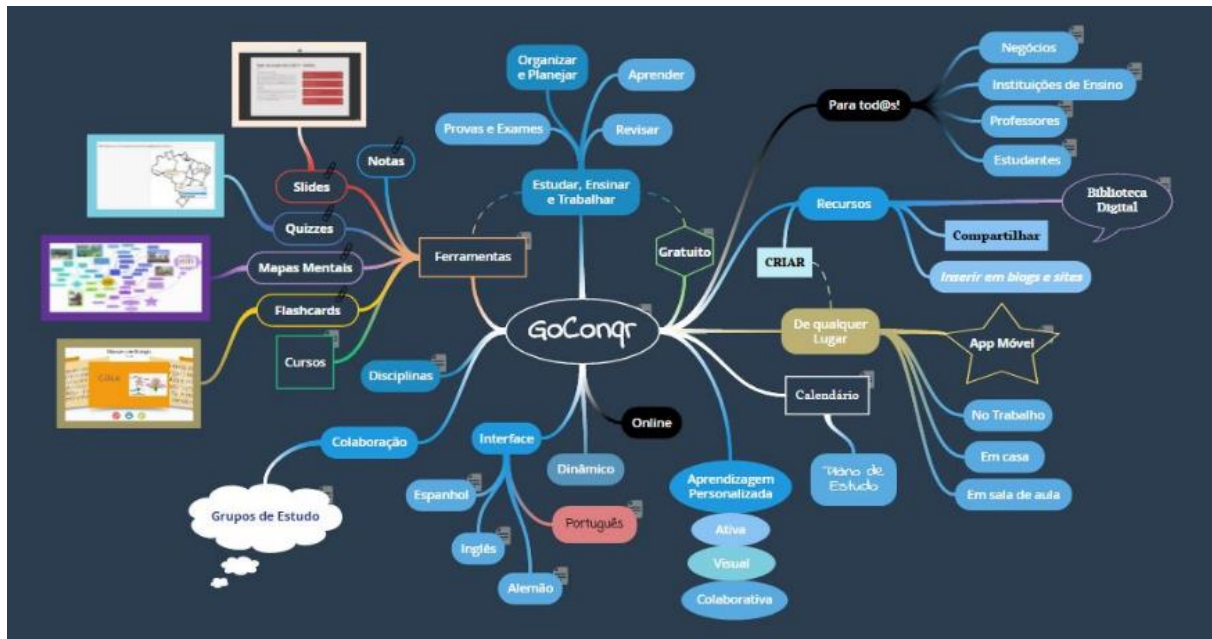
GoConqr

Why GoConqr

GoConqr provides a platform for students to develop, understand and learn key concepts, topics and subject matters. The trainer and the students can create visual study content to aid the learning process and help the students remember the notes better with GoConqr's online study tools: Mind Maps, Flashcards, Study Quizzes and more. The tools allow to easily develop ideas. Also, the students can even share their study notes with their classmates, easing trainer`s workload and giving him different study perspectives, set up study goals to help him focus on his study plan.

What to expect from your students

Students can create resources, share them among one another and work collaboratively. They can think about the key elements of a topic and build a Flowchart or Mind Map and get them to present it in a virtual classroom. The trainer can ask the students to create a Flash Card Deck about the topic. Also, the students can build a quiz with GoConqr Quizzes and share it with the other students.



Source: Wikimedia Commons

GoConqr steps by steps

1. Create an account.
2. Create engaging content.
3. Let your student create engaging content.

GoConqr's features

- Test abilities.
- Track progress.
- Connect the Dots with a Mind Map.
- There is an app (on Google Play and App Store)
- Problem Solving with GoConqr's Flowchart Maker.
- All content created on GoConqr can be shared
- Students can work collaboratively.
- Improving learning by making connections and presenting ideas visually.
- YouTube tutorials specially made for trainers and students (GoConqr Video).
- GoConqr allows the trainer to try different approaches and get the students to build the content.
- Activity feeds on GoConqr have easy to create discussion and comment forums to allow for distance learning and communication.²⁰

²⁰ How to use GoConqr for distance learning and tools that can help you. Retrieved from <https://www.goconqr.com/en/blog/how-to-use-goconqr-for-distance-learning-and-tools-that-can-help-you/>

5. Evaluate

Purpose

The 5E Model enables both formal and informal evaluation. Trainers will observe their students during this process to see if they have a full mastery of the core concepts and give them feedback on the quality of their work and explanations. Formally, the teacher can also administer a summative evaluation at the end of the learning process. It is also helpful to note when students, based on what they studied, tackle problems in a particular way. Self-assessment, peer-assessment, writing assignments, and tests are some of the main types of evaluation that will take place in this phase.

It is important to consider that it is often necessary to implement evaluation activities during other “Es”, meaning that evaluation is not simply something that happens at the end of the learning process, but rather during all its duration. For instance, numerous explore/explain rotations may be needed before students are ready to transition to the elaboration phase. The teacher may move back and forth several times within the Es or may include an additional engagement prior to starting an elaboration phase. The cycle is very flexible and dynamic.²¹



The evaluation activities are an opportunity to assess students and the knowledge that has been acquired, but this is not its only purpose. Evaluation is an opportunity to provide students with feedback on what they have learned so that they can use the information to improve their learning method or correct misconceptions. Evaluation activities during the learning process also allow teachers to evaluate individual student progress toward achieving learning goals and outcomes.

Evaluation is, at the same time, an important part of the learning journey of students. From a cognitive perspective, evaluation is not only useful for assessing learning and providing timely feedback, the act of retrieving information from long-term memory, that we performed when being tested, is one of the most effective actions for strengthening learning. Retrieving information from memory actually changes memory, increasing the probability of successful retrieval in the future.²²

²¹ Duran, et al., 2011, p. 53

²² Ruiz-Martín, et al, 2022.

In conclusion, there are multiple types of evaluations that need to take place during the learning process, both informal and formal. Ongoing formal and informal assessments provide opportunities for teachers to evaluate their instruction, for students to reflect upon their learning, and for students to utilise feedback from the teacher and their peers to evaluate and make improvements to their work. Whereas summative assessments are designed to consolidate students' knowledge and to provide insight into the achievement of the learning objectives related to course level and grade level expectations.²³

Activities

*Socrative*²⁴

Why Socrative?

Socrative is an application created with the aim of including smartphones into pedagogies. The main function of the app is to manage students' participation in classroom activities in real time. It allows the development of multiple types of evaluation activities such as tests, quizzes, and projects, and immediately provides feedback to students. Educators can monitor activities results in real-time or use the outcomes of the activity to evaluate students thanks to the reports that Socrative automatically provides.



Source: Socrative

²³ University of Missouri, 2015, p.3-4.

²⁴ Bello Pintado, A., & Merino Díaz de Cerio, J. (2017). Socrative: A tool to dinamize the classroom. *WPOM-Working Papers on Operations Management*, 8, 72–75. <https://doi.org/10.4995/wpom.v8i0.7167>



What to expect from your students?

Socrative provides the opportunity to create tailor assessment activities that students can easily respond from any devices and receive immediate feedback with the results obtained in each task by the app, as well as further feedback from the educator. The creative activities are not only useful to evaluate the knowledge gained by students, but they can also be used to motivate students, improve communication between classmates or encourage a spirit of self-learning and self-assessment. Through the test and quizzes of Socrative students can:

- Evaluate their progress or knowledge
- Check their progress and acquired core ideas and competencies against established criteria
- Assess progress by comparing current understanding with prior knowledge
- Answer open-ended questions by using observations, evidence, and previously accepted explanations.

Socrative step by step

1. Register and create a class (with an access code for students).
2. Create activities and tasks for students through the intuitive and easy to use app.
3. Set deadlines for students to complete the task and access their results to evaluate them.

Socrative's features

- Creation of 1 public room with a capacity of 50 students
- Possibility to create quizzes, rankings, multiple question types available (multiple choices, true/false and short answer).
- Space Race assessment: questionnaires with timer.
- Access to the online help centre.
- Real-time access to activities results by the educator.
- Visual sharing of assessment results through the app reports.
- Compatible with most devices and available in multiple languages

*Kahoot!*²⁵

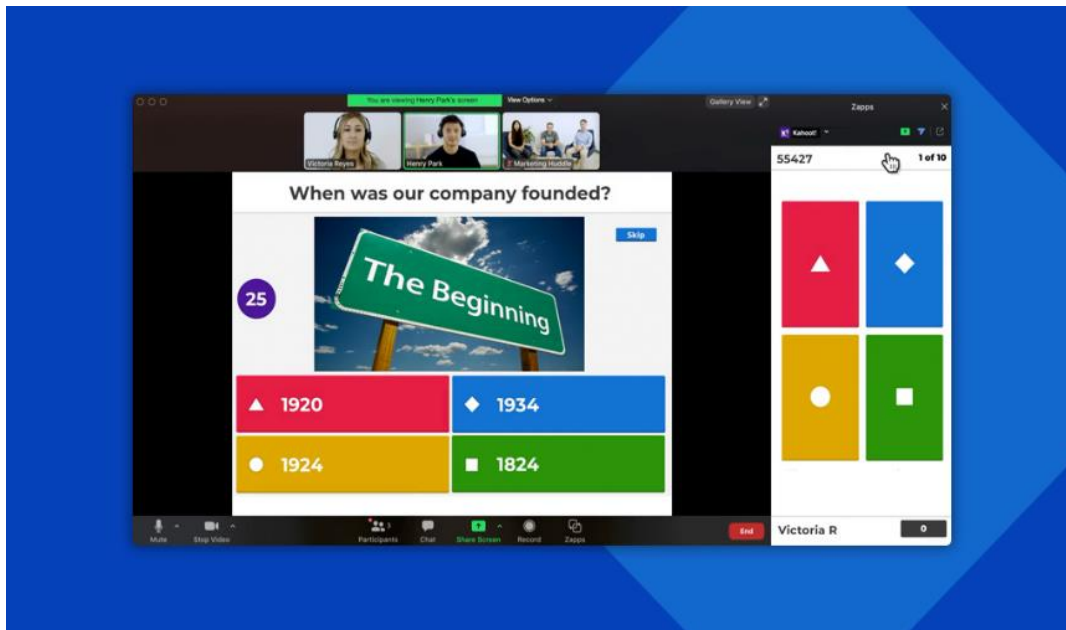
Why Kahoot?

Kahoot is a widely popular game-based learning platform that allows users to easily create, share and undertake learning games or trivia quizzes in minutes. Kahoot offers more than 40 million games already created that anyone could access, making it quick and easy to get started.

What to expect from your students?

Students will be able to participate in fun and interactive game activities with the purpose of being evaluated, self-assess their progress regarding a specific subject, and consolidate their gained knowledge. Students can also foster their motivation, problem-solving and teamwork competencies through the games that are implemented by the teachers.

²⁵ Kahoot! Retrieve from <https://kahoot.com/schools/how-it-works/>



Kahoot step by step

1. Create an account.
2. Create a game from scratch, using the question bank of the app, customising existing tests or using a template. A PIN code will be assigned to the activity to access it.
3. Develop the game with the students, synchronously in a virtual class by sharing a screen through a video conference tool or showing the questions in their devices, or asynchronously to be completed by students in distance learning.
4. Collect the results to evaluate students and provide them with feedback.

Kahoot's features

- Create a quiz in minutes. Possibility to choose from pre-designed templates as the basis, or duplicate and edit existing kahoots.
- Import questions from a spreadsheet or search from millions of questions in our question bank
- Combine multiple kahoots.
- Add slides with a classic layout, add drawings and images, or insert YouTube videos into questions.
- Host kahoots live in class or via video conferencing.
- Display questions and answers on students' devices in live kahoots.
- Assign student-paced challenges for review or homework.
- Get students to play individually or in teams.
- Add multiple types of questions such as multiple-choice or true/false.
- Adjust timer options depending on complexity of question.
- Toggle points between 0, 1000 and 2000.
- Show rankings as visual representations of students' results.

Quizlet²⁶

Why Quizlet?

Quizlet is a global learning platform that offers engaging study tools to help people practise and master what they are learning. Teachers can sign up for a free account and enhance their study material and use the in-course assessment features to track students' progress. The app allows

²⁶ Quizlet. Retrieved from: <https://quizlet.com/es>

students to create study units from scratch or use the existing ones in the app as a starting point, as well as create a classroom where students can access. Students can also use Quizlet on their own to assess their learning and customize the metrics available to monitor their progress, in a way that is more useful for them.

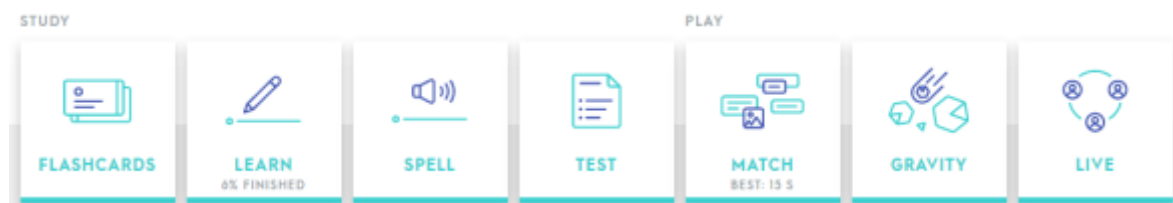
What to expect from your students?

Quizlet is a popular application with more than 2 million users. It allows to easily customise educators and students study material and adapt it to the characteristics and needs of students. The multiple types of evaluation activities that can be created foster students' motivation and engagement with the learning content and with their peers, through the sharing of study tools and the group activities.

Quizlet step by step

Register

1. Create study units with your own material and maintain them actualize.
2. Create a classroom (that students can access with a link or code) and add your units. This is online available in the Teacher mode pay version.
3. Implement the activities and provide feedback to students based on their responses.



Source: Quizlet

Quizlet's features²⁷

The evaluation activities that can be created are:

- Create flashcards that can be words + meanings or words + images. You could also make question and answer cards. Students could also make their own flashcards if they want.
 - Learn – Read the meaning/look at the image and type the correct word.
 - Spell – Type the target word you hear.
 - Test – An auto-generated mix of written, multiple choice, and true and false questions based on the vocabulary set.
 - Match/Gravity – a couple of games using the vocab set. Match works well on an interactive whiteboard.
 - Live – play a live game with multiple participants.
- Create learning units and classes that students can join.
- Track students' progress as well as actualize your study material and activities based on the feedback that provides their responses.

Eduflow – Peer Review

Why Eduflow?

Eduflow is a very easy to use platform with great accessibility from any type of device that allows to design and develop complete online courses with personalize features and activities. Between its activities we find question and answer exercises, virtual debates, group tasks, self-assessment

²⁷ Exploring the Features of Quizlet. The Knowledge Network for Innovations in Learning and Teaching (KNILT), 2018, University at Albany's School of Education. Retrieved from: https://knilt.arcc.albany.edu/Unit_3:_Exploring_the_Features_of_Quizlet

activities and more. It is especially relevant because it has a Peer review option that allows students to review each other works and share feedback and ideas.

What to expect from your students?

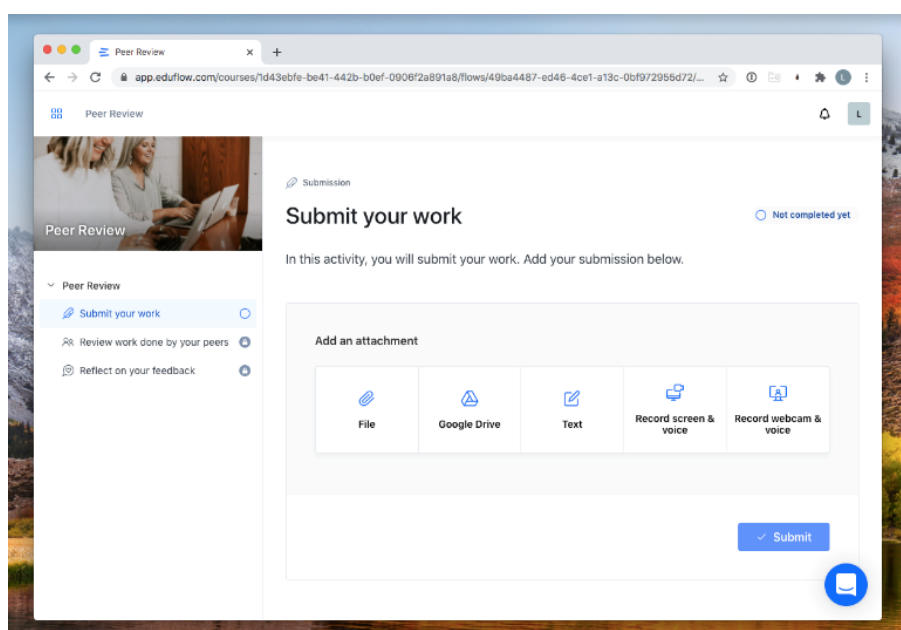
The Peer Review option of this application will encourage students to collaborate and help each other, give feedback to other students, as well as to reflect in their own learning by reading and assessing other students' work. The app will foster their motivation and engagement, support them to learn to work independently, help them understand the intention behind the work they do, and improve their critical thinking capabilities.

Eduflow Peer Review step by step

1. Creating an Eduflow Account and Course.
2. Adding Content and Submission Activities.
3. Creating a Peer Review Activity.
4. Creating Feedback Reflection and Scoring Activities.
5. Developing and Incorporating Feedback.

Eduflow Peer Review's features

- Space for students to submit their work, multiple types of assignments is possible.
- Establish deadlines
- Allow students to review a defined number of other submissions using a rubric presented in a question format.
- Enable different options to review and score students work. Open or close ended multiple-choice questions can be introduced, as well as a grading option.
- Possibility to enable an additional academic review to be provided by the educator.
- Possibility to add the self-review to the peer review option.
- Use the Feedback Reflection option for students to read, reflect and incorporate the feedback received from their peers.
- Possibility to resubmit the work after the feedback from peers is incorporated.



Source: Eduflow



Effective tools for digital facilitators

Gamification tools

*Kahoot*²⁸

What is Kahoot?

Kahoot is a quiz-based learning platform that works for hybrid learning and flipped classroom situations by making learning fun and engaging. It's a question-based website that a teacher can use in the class. The main goal of Kahoot is to ask questions entertainingly. Kahoot! is a cloud-based quiz platform that is ideal for students and teachers. Since the game-based platform allows you to create new quizzes from scratch, it's possible to be creative and offer bespoke learning options for students. Kahoot! offers a question and then optional multiple-choice answers. This can be accompanied by rich media such as images and videos to add more interactivity.

Kahoot is an online game-based learning platform. It allows teachers, organizations, and parents to set up fun web-based learning for others. This could include your coaches, athletes, or parents. Kahoot can be used as a fun trivia activity to do with members of your organization or coaches to use with their sports players or it can be just a series of fun questions.

What can Kahoot do?

- Online quizzes which can be used in face-to-face, hybrid and online education
- Multiple choice questions
- Quizzes can be accompanied by rich media such as images and videos
- Live or self-paced quizzes
- Timer-based quiz mode switched on or off
- Contests with response analytics and winners

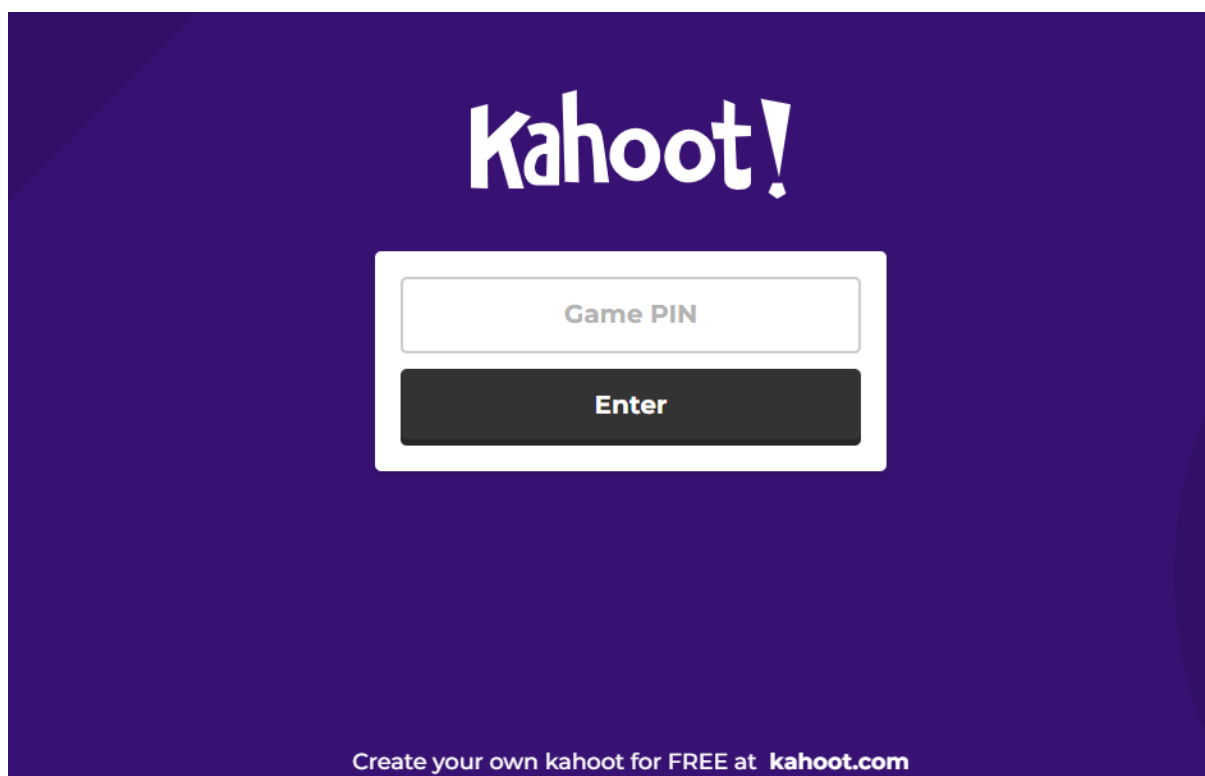
How is Kahoot working?

On the Kahoot website - www.kahoot.com, there are two main ways in which you can set up a game which are outlined as follows:

1. Classic Kahoot (host live) – the organizer of Kahoot, would set up a series of questions/trivia, each participant would need access to a device (laptop, iPad, phone, etc). Questions would be posted and participants have a set time to answer the questions. Everyone plays at the same time. The organizer of the Kahoot would need to be able to share their screen with the participants as the questions only appear on the organizer's screen. There are a variety of question types that can be used from multiple choice to puzzle to open-ended questions. The Classic Kahoot can be used as a fun social activity through an online meeting/chat module (i.e. – Zoom)
2. Student-paced challenge – organizers set up a series of questions/trivia for the participants to play at their own pace at home. Participants would see both the question and possible answers or a space to submit an answer on their screen. The student-paced challenge could be used as a way to challenge players on their knowledge of the game or just a fun activity for them to do at home with questions related to the sport they play. Kahoot can be used for free or premium packages can be purchased for a fee.

²⁸ What is Kahoot! and How Does it Work for Teachers? <https://www.techlearning.com/how-to/what-is-kahoot-and-how-does-it-work-for-teachers>

While Kahoot can be used in the classroom, it's ideal for remote learning use. Teachers can set a quiz and wait to see the scores as students complete it. Or they can carry out a live hosted quiz using video – with third-party apps such as Zoom or Meet – to be there as students are working through the challenges.



Source: Kahoot

While there is a timer-based quiz mode, you can also choose to turn that off. In that instance, it's possible to set more complex tasks that require research time.

Teachers can also review results and run analytics from game reports for formative assessments so as to better judge progress being made in the class.

To get started head to getkahoot.com and sign up for a free account. Select "Sign Up," then pick "Teacher" followed by your institution's level "school," "higher education," or "school administration." You are then able to register using your email and a password or with a Google or Microsoft account – ideal if your school already uses Google Classroom or Microsoft Teams.

*BookWidgets*²⁹

What is BookWidgets?

BookWidgets is an easy-to-use platform for creating interactive exercises like exit slips, games, timelines, photo- and video-based activities, and more. It integrates with other programs like Google Classroom, Canvas, and Moodle. A diverse library of widgets can be used to support all subject areas. Widgets are grouped by test and review (exit slips, flash cards, quizzes, timelines, and worksheets), games (bingo, memory, and crosswords), pictures and videos (hot-spot image, YouTube player, and

²⁹ BookWidgets: Design Interactive and Engaging Digital Content
<http://www.edtechroundup.org/reviews/bookwidgets-design-interactive-and-engaging-digital-content>

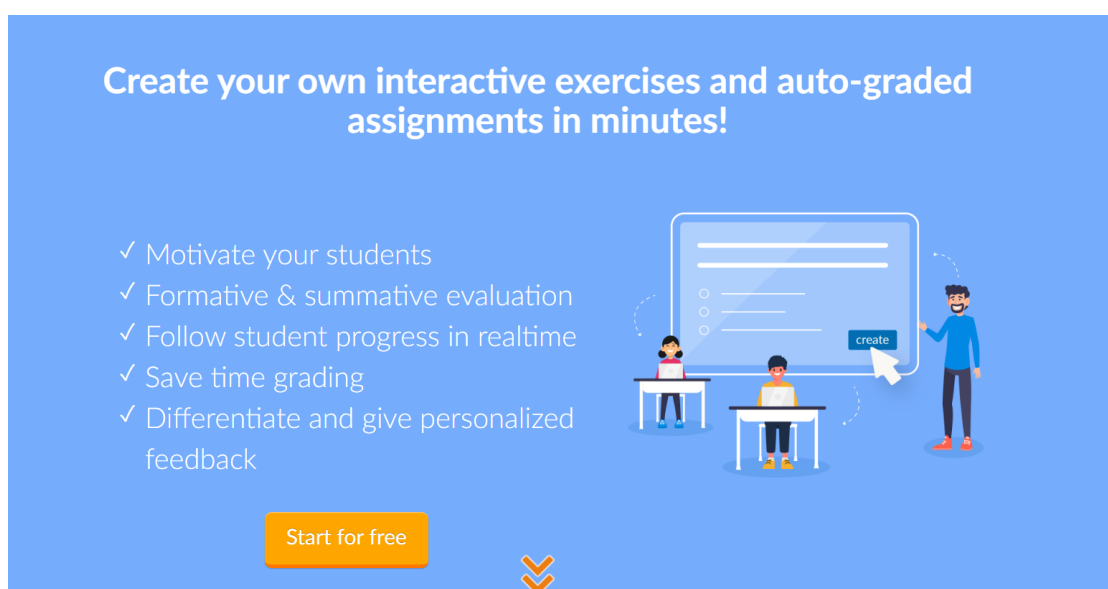
image carousel), and math (active plot, charts, and arithmetic). Teachers can also embed PDFs, Google Maps, and Wikipedia articles.

What can BookWidgets do?

- Interactive exercises like exit slips, games, timelines, photo- and video-based activities
- Integrates with other programs like Google Classroom, Canvas, and Moodle
- Customise 40 different widgets
- Embed PDFs, Google Maps, and Wikipedia articles
- Share widgets as a link or embedded
- Simple assessments with flash cards, puzzles, or games such as hangman or bingo
- 30+ types of quiz questions suitable for students' self-grading

How is BookWidgets working?

Teachers can customize each of the widgets, and a wizard walks them through the building process. Teachers can share finished widgets as a link or embed them on any website or through Google Classroom. Analytics allows teachers to track and assess student activity. A weekly teacher blog suggests new approaches and practical applications.



The graphic features a blue background with white text. At the top, it says "Create your own interactive exercises and auto-graded assignments in minutes!". Below this, there is a list of five benefits, each preceded by a checkmark: "Motivate your students", "Formative & summative evaluation", "Follow student progress in realtime", "Save time grading", and "Differentiate and give personalized feedback". To the right of the list is an illustration of a teacher standing next to a large screen displaying a form with a "create" button. Two students are seated at desks in front of the screen. At the bottom left of the graphic is an orange button that says "Start for free". At the bottom center is a double chevron icon pointing downwards.

Source: BookWidgets

BookWidgets allows teachers to create a ton of different types of interactive content. Examples of each type of widget are available to use as a template to start out, and a tutorial walks you through the steps. There are 40 different widgets you can create that can be shared through a link, a QR code, an email, and Google Classroom. Simple assessments you can integrate include exit slips, quizzes, and worksheets. Kids can practice and review skills with flash cards, puzzles, or games such as hangman or bingo.

Create a blended/flipped learning approach with personalized materials that can be easily assigned through your Google Classroom. When creating quizzes, select from over 30 types of questions for all content areas. Include answers in the setup so that quizzes can be self-grading and students can gain instant feedback. Differentiate digitally by creating versions of one worksheet and assigning it to groups of students in Google Classroom. The WebQuest widget is especially useful for a blended approach; within the widget, you can embed instructional videos, games, and quizzes.



Creating interactive classroom activities and engaging teaching materials is mostly a breeze with BookWidgets. Though the organization of widgets may be clunky and confusing, it's generally straightforward and easy to understand, saving teachers' valuable preparation time. The variety of 40+ widgets encourages teachers to try digital lessons with a step-by-step guide when starting out. Examples of all widgets are also available and can be copied for use. Since there's such a wide variety of widgets, teachers can create simple lessons and activities for all learning needs, though the activities themselves -- especially the games -- tend to prioritize memorization and recall.

Teachers can individualize lessons and activities to meet the needs of students and engage them with a digital approach. The assessment options are useful: exit slips, quizzes, and worksheets offer immediate feedback, especially since they can be created as self-checking. Teachers can also see what student work has been turned in to continually monitor progress.

*PlayBrighter*³⁰

What is PlayBrighter?

In this technological age where kids have access to, and are able to immerse themselves in high-quality game environments that test their gathered knowledge, acquired skills and ingenuity in engaging and fast-action situations, it is a constant struggle for teachers to monitor and assess learning in engaging and stimulating ways that is relevant to students of the digital age – it's now a fact that the photocopied 20 question hand-out just doesn't cut it anymore as the students don't place any value on what they see as an out-dated method of assessment.

There is also the chore of having to mark countless, test papers that are sometimes scruffy, illegible and have the potential to get mislaid. Surely, in this day and age there must be a better way. Well, there is and it's called PlayBrighter!

What can PlayBrighter do?

- Set students 'missions'
- Assess learning in engaging and stimulating ways
- Provides analytics for students' progress and results

How is PlayBrighter working?

Playbrighter is a game-based learning environment, which contains over 20,000 curricula-based questions to get teachers started and which they can then add to if they want to, allowing them to test their students on any subject area they wish. The subjects that are covered include:

- English (Key stage 2, 3 and 4)
- Mathematics (Key stage 2, 3 and 4)
- Key stage 2 and 3 Science
- GCSE Biology, Chemistry and Physics
- Key Stage 3 and 4 Geography
- Key Stage 3 and 4 R.E
- Key Stage 3 and 4 PSHE and Citizenship

There are differentiated questions so that missions can be tailored to suit students of varying abilities, either from a group-wide point of view or on an individual student basis. On 'PlayBrighter', teachers set their students 'missions', which challenges them to play one of the games. They progress through the game by answering the questions that the teacher has set. So, as 'PlayBrighter' state on their website for instance, "In the French room, students might release a Number One single

³⁰ PlayBrighter – Educational games for your class <https://www.whiteboardblog.co.uk/2012/09/playbrighter/>



by mastering the passé composé, or defeat an international conspiracy by conjugating ‘avoir’” or in the science area, students maybe successful by calculating the speed of an object or stating the formula for Carbon Dioxide.

When students are successful on their ‘missions’ they are rewarded by earning some of the game environment currency. They can use this to personalise different aspects for their avatar by purchasing new clothes or having a different hair colour etc.

Now for teachers, ‘PlayBrighter’ automatically marks the work of the students as they complete each mission saving teachers huge amounts of their valuable time that they would otherwise spend marking. The teacher area also offers a complete detailed breakdown of those assessments, including informative charts that track individual student’s progress. This applies to whether the teacher runs tests within the classroom or sets the ‘missions’ for homework.

The most fantastic aspect of ‘PlayBrighter’ is that it is completely free, all teachers have to do is sign up a group of students and set them a mission. Students will find the game enjoyable, engaging and immersive and will probably forget that they are actually learning, as they will find ‘PlayBrighter’.







Artificial intelligence tools

Alexa Skill Blueprints

What is Alexa Skill Blueprints?

Alexa Skill Blueprints are a new way for you to customize your Alexa experience by adding personalized Alexa skills and responses. Personalized skills and responses make Alexa even more knowledgeable, delivering a delightful experience that is unique to you and your family or classroom. You can create your own Alexa skills and responses in minutes with easy-to-use templates – just fill in the blanks. Choose from the different blueprints to see what kind of skill you'd like to make. What is interesting is that there's no limit to the number of skills you can make, so create as many as you like.³¹

Featured Blueprints

 School Schedule Set up an at-home school schedule, including subjects, activities, and reminders.	 Custom Q&A Customize Alexa's response to your questions.	 Chore Chart Schedule and track weekly chores for your entire household.	 Whose Turn Figure out whose turn it is to do something by having Alexa choose for you.	 How Many Days Give Alexa an important date, and she'll count down the days to your event.	 Burns Roast your friends and family with lighthearted burns.
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What can Alexa Skill Blueprints do?

- Receive reminders when a student's class period or activity begins / ends.
- To hear Alexa summarize the school schedule, say, "Alexa, open School Schedule."
- Request to hear a student's schedule for any day of the week - "Alexa, what's Jacob's school schedule this Friday?"
- Challenge your students with open-ended questions.
- Create a story and test your memory.
- Create and access a personal list of facts on any topic.
- Learn in "review mode" to hear terms and definitions.
- Switch to "test mode," where Alexa reads the term, then you say the definition.

How is Alexa Skill Blueprints working?

A speech recognition software is used to convert verbal language into text form using algorithms. Speech recognition has become one of the widely used technologies, as it offers great opportunity to interact and communicate with automated machines. Voice assistants, or virtual assistants, are more than just the cool, often-female voices that respond to verbal requests to play a song or check the weather. Speech recognition has become one of the widely used technologies, as it offers great opportunity to interact and communicate with automated machines. Precisely, it can be affirmed that speech recognition facilitates its users and helps them to perform their daily routine tasks, in a more convenient and effective manner.³²

Common inventions that use voice assistant are the famous assistants from our phones that let people control their devices with spoken commands. People can easily open an app, navigate, and

³¹ Alexa Skills Blueprints. <https://blueprints.amazon.com/home>

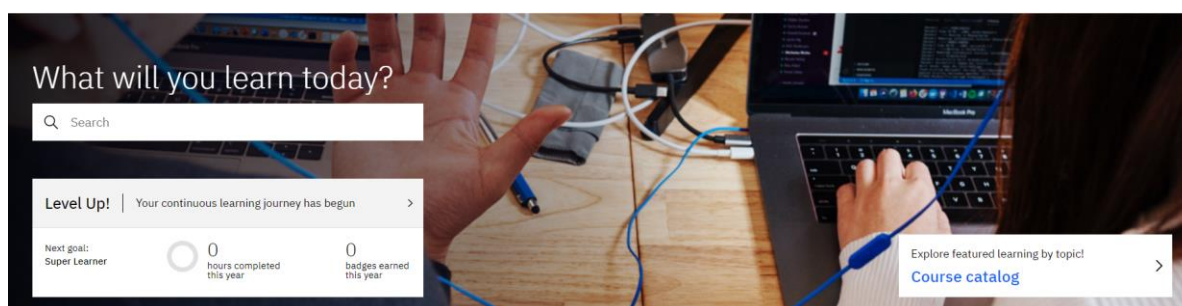
³² Khaled M. Alhawti (2015). *Advances in Artificial Intelligence Using Speech Recognition*. doi.org/10.5281/zenodo.1106879

edit text hands-free using just their voice. Examples of voice assistant are: Amazon Alexa, Google Assistant, Apple Siri, Microsoft Cortana, and Samsung Bixby.

IBM SkillsBuild

What is IBM SkillsBuild?³³

IBM SkillsBuild for organizations provides integrated learning opportunities for students (13-18) or job seekers with free digital training, project-based learning, and coaching to help them build the skills they'll need to be career-ready. SkillsBuild for Students is a digital learning platform where people can find, plan, manage, and track all their learning and badges they earn. SkillsBuild for Students offers a wealth of learning recommendations through channels, hot roles & skills, and programs & resources. And when you're ready to grow or switch your role, people will find job recommendations just for them.



What can IBM SkillsBuild do?

- Promote continuous learning.
- Free resources.
- Curriculum maps.
- Fun, self-placed learning for students.
- Track student progress and evaluate.
- Assign learning activities and establish due date.
- Digital badges.
- Learning activities.
- Offers a toolkit for trainers and students too.

What is more, IBM Skills for Students makes learning suitable for everyone because it has recommended learning. Their machine learning algorithms recommend channels to students based upon what they know from their profiles, their job role, and other users like them.

How is IBM SkillsBuild working?

Today there are many services suggesting in-the-moment recommendations, as they use artificial intelligence for analyzing interactions of the users and find visually proper products that will interest any individual customer. Due to AI, recommendation engines make quick and to-the-point recommendations tailored to each customer's needs and preferences. Classic recommender system processes data through these four steps: collecting, storing, analyzing and filtering.

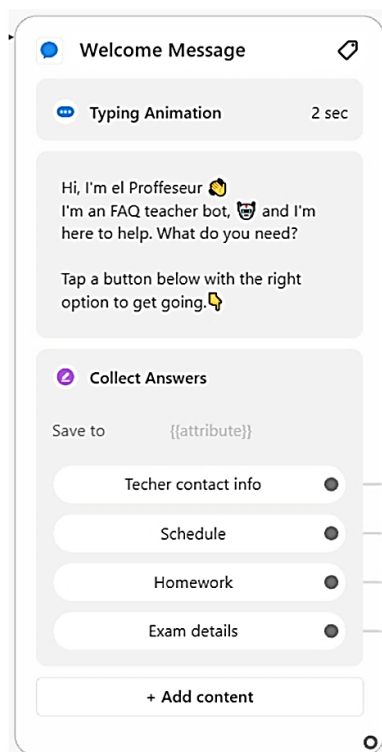
Another good example of recommendation engine usage in Media is done by YouTube and Netflix. YouTube with its "Recommended Videos" and "Other Movies You May Enjoy" by Netflix are lived examples of AI recommendation engine usage.³⁴

³³ IBM SkillsBuild. Retrieved from <http://www.skillsbuild.org/>

Chatfuel

What is Chatfuel?

Chatfuel is first and foremost a powerful chatbot builder that focuses on automation and versatility. Its main focus is building bots that can do it all, from answering questions to collecting emails.



Example of a chatbot made by Chatfuel

Chatfuel can be used for just about anything related to Facebook Messenger chatbots. Many businesses use it to increase conversions or generate leads, but you can also use it to optimize your overall engagement with your audience.³⁵

Conversational learning via bots represents an entirely new chapter in the evolution of how we educate young people. Education chatbots allow educators to populate lesson materials, answers to frequently asked questions and other engaging resources to assist your students in learning.³⁶

What can Chatfuel do?

- Answer questions.
- Give clear answers.
- Extract and export useful data.
- Students don't wait in line to get an answer to their questions.
- Help students understand a subject better.
- Classroom sessions are more dynamic.

³⁴ *How Does AI Work With Product Recommendation Systems?* Retrieved from <https://www.smarthint.co/en/ai-product-recommendation-engine/>

³⁵ *Chatfuel review.* Retrieved from <https://www.chatbots.org/chatfuel>

³⁶ *Transform your teaching with a chatbot* (2021, June 13). Retrieved from <https://www.cta.org/educator/posts/transform-teaching-with-chatbot>



- Students enjoy their educational experience more with the bot.
- The customizable tags let the trainer provide the right content to students.
- Set up reminders (homework, class news, lesson details and other important messages).⁸

How is Chatfuel working?

Chatfuel also has an AI component where you can instruct the bot to respond to certain keywords. This is another common feature that most chatbots have, and Chatfuel takes a nice, straightforward approach to it.⁸

A chatbot is software that can talk with users automatically in a humanlike, conversational style.³⁷ Chatbot makers utilize artificial intelligence and the latest conversational design to create bots that can communicate with students on all subjects of elementary, secondary, high school and up to university levels.

Furthermore, another good example of chatbot that can be used in teaching is Botsify.

³⁷ *Getting started*. Retrieved from <https://docs.chatfuel.com/en/articles/2568024-getting-started>

Data Analysis tools

Easyclass³⁸

What is Easyclass?

Easyclass is a Learning Management System (LMS) that allows educators to create digital classes and store materials online; manage class discussions; create assignments, quizzes and exams; monitor due dates and results; and provide students with feedback, all in one place.

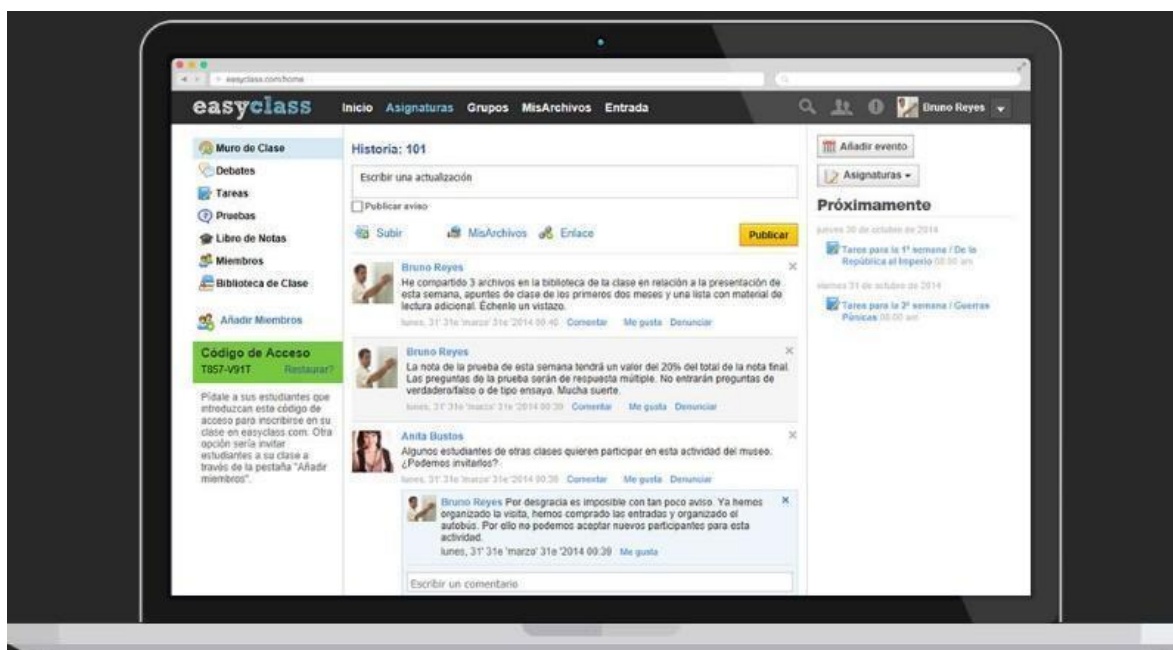
Easyclass is an easy-to-use tool, but at the same time it is a powerful open technology solution in education. Easyclass has announced that they believe that an LMS should not be a closed system but should be a platform that connects everyone in education and promotes learning anytime and anywhere.

What can Easyclass do?

The main features available in Easyclass are intended for:

- Creating assignments and other activities online and managing notes and corrections conveniently.
- Share and store resources, content or notes online and have 24-hour access.
- Create discussion groups among students in a given class.

One of the most useful functions that this platform provides is The Integrated Gradebook feature. This feature automatically adds on students' results when a new assignment is posted in a new column of the gradebook. The Gradebook stores every grade assigned by the teacher. Then, data analysis is used successfully to track students' progress, and to help the teacher manage assignments.



Source: Easyclass

Easyclass allows creating many types of activities, including debates, assignments, tests, and posts in a class wall. Through the platform educators can easily monitor students' participation and do a

³⁸ Easyclass. Retrieved from: <https://www.easyclass.com/about>



follow up on how these different activities are welcomed by students. This useful information can be then used to improve lessons to better achieve the learning objectives and to adapt to the characteristics of our students.

The platform has many channels to allow communication between teacher and students, making it easy and quick to provide feedback to students on their performance.

How Easyclass works?

- Digital classes are created and managed by teachers
- Teachers have administrative rights over students' participation in their class.
- Students need an access code to join the class.
- Teachers can delete messages and remove class members.
- Teachers can choose to receive automatic notification of student posts in the class before they are published.

One of the main benefits of this platform is its security. It comes with a secured cloud-based SaaS with no advertisements, keeping privacy and safety at foreground. All content created within the online classes' platform can be viewed by only the class members.

Plickers³⁹

What is Plickers?

Plickers is an assessment tool that allows teachers to collect on-the-spot formative assessment data. Teachers can use this tool with previous planning or on the go as needed, and it is a useful tool both in face to face, in distance learning and in hybrid learning. It is a useful data collection tool that provides teachers with the information needed to inform their instruction.

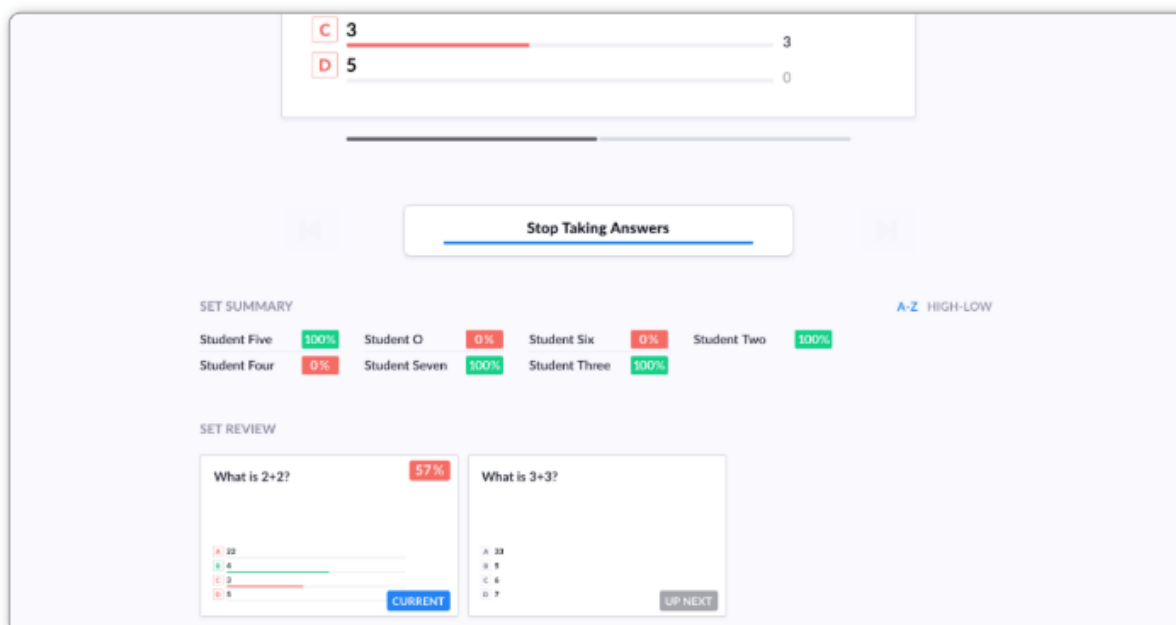
What can Plickers do?

Plickers main function is to create fun and interactive activities for students to keep them engaged and motivated, and at the same time collect useful data that the educator can use to improve their lessons, identifying the questions or explanations that are not comprehend by students and need to be modified, to adapt them to students needs and personalise them to individuals if appropriate, to evaluate students learning process and provide them with feedback when necessary.

Plickers' features that allow implementing data collection in teachers' lessons are:

- Different question types available.
- Easy distribution in phases: ask phase, accept answers phase, and stop answers phase, review phase.
- Answers from students are received in real-time.
- Stats from students' answers are produced by the application immediately after all students have answers, allowing teachers to adapt their lessons on the go, based on students' understanding.
- Possibility to add the Timer option and a countdown option.
- The "Now Playing" page shows an overview of student's answers; it shows the percentage of right and wrong answers per question, as well as to which students the answer belongs.

³⁹ Plickers E-Learning. Retrieved from: <https://help.plickers.com/hc/en-us/articles/1260804067889-Overview-Plickers-E-Learning>



Source: Plickers

How Plickers works?

The application is intuitive and user-friendly, teachers can choose to programme questions or to do them as they go during a lesson, and this collects useful information to improve the quality of their instruction.

- Teachers need to create an account and create links for each of their students to enter Plickers.
- Different subjects can be created, and they will appear to the students of that class.
- The screen for students will appear in the students' devices, and teachers have their private view.
- Privacy: The teacher only has to provide First, Last name, email, username and password. Student information is not required to use the tool. Privacy policy states how location, use and cookies are used. Students' answers are also private.
- Accessibility: The Plickers app is free for both iOS and Android. The app can be used on phones and tablets.

Lessons Plan - Symbaloo

What is Lesson Plan?⁴⁰

The Lesson Plan editor of Symbaloo allows educators to create personalised digital learning paths for students that take them to the different activities of their learning itinerary. You can use a wide range of digital resources and build the pathway block by block so that your students can learn at their own pace.

You can include resources such as videos, articles, questions and even blocks created in your Symbaloo webmixes. You can redirect students to any type of resource or even assignments and exams, thus all the content of a lesson or course can be included in the Lesson Plan that can be customised for students individually if necessary.

⁴⁰ Lesson Plan. Retrieved from: http://lessonplans.symbaloo.com/?lang=es%20_blank

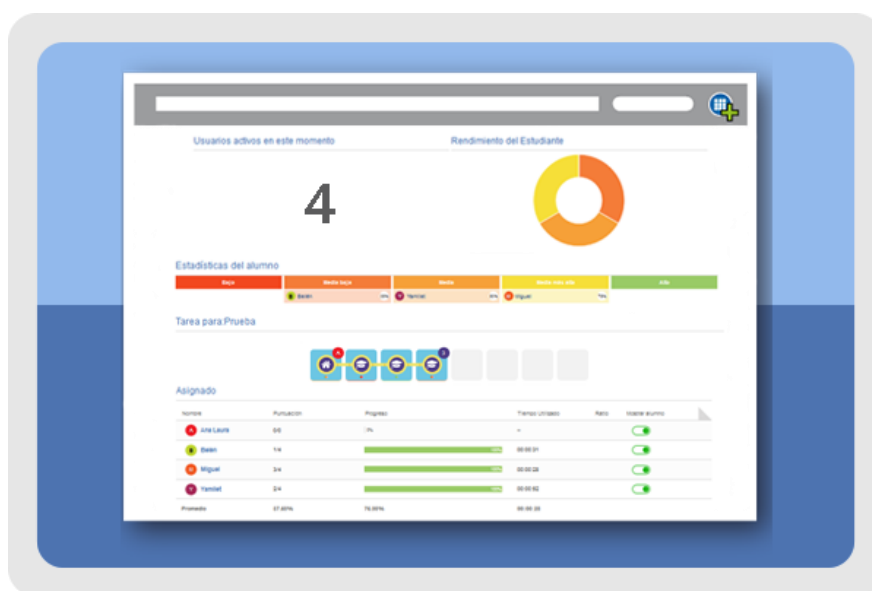
What can Lessons Plan do?⁴¹

The itinerary elaborated with Lesson Plans allows including multiple elements to make the learning experience more fun and immersive for students. Teachers can add different game elements such as game graphics, awards, visual representations for students, include clues and additional explanations during assessment activities, and more.

Once elaborated the learning itineraries in the Lesson Plan, educators can access a data analytics page where data collected from students' actions is integrated in real-time, having always access to actualize information from students' performance.

By accessing the Statistics page educators have access to:

- What point of the itinerary students are.
- The number of questions answered correctly and incorrectly
- The time needed to complete each question
- Access to more detailed information from each individual student.



Source: Symbaloo

How Lessons Plan works?⁴²

- Teachers need to register in Lessons Plan.
- Once the itinerary is created, access "Assign and start monitoring" and obtained a code for the itinerary.
- Share the access code with students through the different options available, such as google classroom, email, QR, or link.
- Start the lesson plan and monitor in real time your students' progress.
- Privacy: students do not need to register in Lessons Plan to access.

⁴¹ Statistics in real time (Lesson Plans). Retrieved from:
<https://es.help.symbaloo.com/portal/es/kb/articles/%C2%A1m%C3%A1s-informaci%C3%B3n-para-tus-alumnos-27-3-2018>

⁴² Statistics in real time (Lesson Plans).



Recommendations for instructional designers and facilitators

Plan: Think about what content, information or tasks you need to give to your students. You can create a plan of what you want to achieve in every lesson and at the end of a week. Challenge your students to create their own content and engage in self-directed learning. It is important that the plans allow students to be creative and engage in different tools to deliver what they have learned.

Students' needs: Remember students learn by “doing” and with distance learning your face to face time is limited, so the more “doing” tasks you can give them the better.

Be interactive: When working alone or at a distance the main challenge can be focus and boredom. The mind can easily wander if it is not challenged and engaged when students are working alone. We all know variety is the spice of life so change it up, use a multiple of different learning focused tools, it helps that a student can use different tools, even if they are covering the same topic, the more angles we can explain a concept or topic from the better a student will understand it.

Communicate: Feedback from students' peers and trainers encourages a student to keep going and keep trying, every effort should be encouraged and communicated in a positive and supportive way. Comments and discussions forms can be used in an online environment to support your students, in the same way you encourage and support them in the classroom.

Be prepared: When you are planning an online class, you will need to master effective class room management skills. Set clear expectations about the class start and end time, and as you deliver the class, keep it within the planned time. Ensure you have an appropriate number of concepts to cover within your allocated time. Usually, activities and discussions end up taking more time than initially planned. If your session spans longer than sixty minutes, consider including breaks in your session to ensure your learners can move away from the computer and return with increased attention. Take care of the timing of the small group activities and discussions to ensure they are progressing within the allocated timelines.

Remember: At the beginning of each session, remind the students of the expectations for classroom engagement. Encourage learners to participate in the classroom discussions using virtual chat options and questions and answers.

Get along with technology: Test your audio, video, and screen-sharing options at least 30 minutes before the start of class. During the class, if you run into a technical issue, do not panic. Turn off your video and audio and check the system. Fix the problem. Inform the learners there is a technical issue and ask them to wait online or reconnect at a set time. Once you resolve the issue and feel more relaxed, turn the audio and video on, and take control of the lesson calmly and confidently.

Reflect: After each session, reflect on the strengths and areas in need of improvement. Celebrate your strengths and continue to hone in on the areas you can improve.⁴³

⁴³ Sriharan, A. Teaching Online: Tips for Engaging Students in Virtual Classrooms. Med.Sci.Educ. 30, 1673–1675 (2020).
<https://doi.org/10.1007/s40670-020-01116-7>



VET digital facilitator's competence map

DigiFacT addresses a huge gap in the VET community in Europe, the lack of digital learning resources in teaching, essential to help educators to develop their own digital skills, with the ultimate purpose of engaging their students and provide them with the key knowledge and skills in the digital era.

The goal of this report is to offer a map of digital competences required in VET educators today, following the state-of-the-art of digital education, the recommendations of the DigCompEdu Framework by the European Commission, and the prior findings of the research developed as part of the project.



Map of competences for VET Educators. DigiCompEdu.

Competency mapping is the process of identifying the specific skills, knowledge, abilities, and behaviours required to operate effectively in a specific trade, profession, or job position. Competency maps are often referred to as competency profiles or skills profiles.

Specifically in the field of education, maps are how skills and competencies, or competency definitions can be aggregated to form more comprehensive skills and competencies or decomposed into component skills or competencies. Taxonomies are simple maps in the form of trees, according to the IMS Reusable Definition of Competency or Educational Objective - Best Practice and Implementation Guide⁴⁴

Competence maps allow defining curriculum content in terms of interrelated competencies rather than in terms of fragmented or disassociated knowledge, skills, and attitudes.

The following publication constitutes a map of competencies requires in any educator to become digital facilitators and introduce digital skills, platforms, processes, and tools in their teaching to enhance the learning experience of students. It is aimed to help educators understand and asses the digital skills they required, identify their needs and gaps, and work towards improving their competencies.

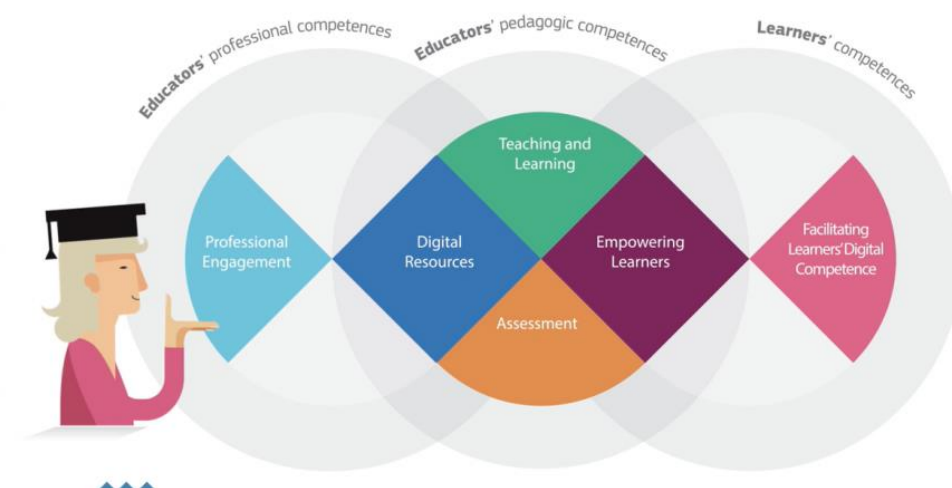
The DigiFacT consortium has chosen to use the DigCompEdu Framework as their reference document. The **European Framework for the Digital Competence of Educators (DigCompEdu)** is a scientifically sound framework describing what it means for educators to be digitally competent. It provides a general reference frame to support the development of educator-specific digital competences in Europe. DigCompEdu is directed towards educators at all levels of education, from early childhood to higher and adult education, including general and vocational education and training, special needs education, and non-formal learning contexts.⁴⁵ In the fields of education and training, and employment, there was a need to have a common reference framework of what it means to be digitally savvy in an increasingly globalised and digital world.

The Digital Facilitator Trainer Role competence map is divided in the 6 areas of competence, following the DigCompEdu structure:

1. Professional Engagement
2. Digital Resources
3. Teaching and Learning
4. Assessment
5. Empowering Learners
6. Facilitating Learners Digital Competence

⁴⁴ IMS, IMS Reusable Definition of Competency or Educational Objective - Best Practice and Implementation Guide, Version 1.0 Final Specification, May 2016

⁴⁵ Redecker, C. European Framework for the Digital Competence of Educators: DigCompEdu. Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-73494-6, doi:10.2760/159770, JRC107466



Each has been broken down in 3 dimensions:

1. Explanation of the area of competence
2. The needs assess in the VET community of Spain, Romania, and Turkey in the specific area
3. The specific competences of educators in each area of competence

The competence map also provides specific skills identify during the research develop on the project in each of the fields of focus: Gamification, AI, and data analytics, apply to education and training.

Area of competence 1: Professional Engagement

Dimension 1: What is and why is important to foster Professional Engagement in educators?

The importance of considering the area of competence refer to as Professional Engagement when examining the digital competences of educators, lies in the fact that the simple use of digital skills for the learning and teaching process would not cover all the aspects of an educator's work, as we cannot ignore the rest of the professional and educational relationships that unfold. Educators have to maintain good communication with their students, families, the school and third parties involved at all times; they need to communicate and collaborate with other educators to continue to develop professionally but also to provide a better educational experience for their students; and they must use technologies to organise themselves, improve their pedagogical skills, learn new skills and adapt to changes in the educational world and the world of work.

The domain on professional engagement refers to two important areas, the engagement of the teachers with their professional development as ongoing learners. And their engagement with all parties of the teaching and learning process, meaning colleagues, their teaching institutions, students, and families. Therefore, the maintenance of participation and collaboration with all actors of the teaching community that they are a part of, with the goal of fostering students' well-being and intellectual and personal development.



Source: Edmentum blog

Summing up, the application of digital competences to the sphere of professional engagement implies the proper use of digital tools and processes to all tasks related to the professional practice of educators.

According to the DigiCompEdu Framework, 2017, we can find four main professional engagement competencies, that are required in educators to have an adequate level of digital competence, these are the following:

Organisational communication	To use digital resources to improve the communication with learners, the teaching institutions, and third parties involve in the educational and labour world. Meaning to provide better and more efficient communication, as well as to contribute with and share organizational strategies for communication.
Professional collaboration	To use ICTs to collaborate with other educators, to improve the exchanges of knowledge and experiences, and to work collaborative in the improvement of teaching techniques and pedagogical approaches.
Reflective practice	To reflect, assess, develop, and improve your own digital pedagogical practices for your individual professional development, but also in the aspects that involve learners and the educational community.
Digital Continuous Professional Development (CPD)	To use digital resources for your continuous professional development as an educator.

Dimension 2: Needs assessed in VET educators

As part of the project, individuals developing or involved in VET education were interviewed in the three countries that are part of the DigiFacT consortium: Spain, Romania, and Turkey, with the intention of gathering the real needs of VET educators in the geographical scope of this project. VET workers, NGO staff and E-learning associations have been asked a series of questions to depict their views on Professional Engagement and how it's influence by digital technologies in the day-to-day practice of an educator.

Participants in the interview answered two key questions in relation to this area of competence:

“Q1: Which digital tools do you use to contact and collaborate with colleagues, learners, and parents? How do you use them?”

The first questions refer to two of the main competences priorly announce on the area of Professional Engagement of educators: Organisational communication and professional collaboration. The interview question aims at collecting the ways in which VET educators are



communicating with the learning community and collaborating with colleagues to promote the sharing of good practices and innovations.

The answers collected in the three countries depict a varied handful of digital tools for communication and learning platforms that are also use by educators to communicate and collaborate, and a series of statements in relation to what is valued by educators when choosing these tools, they can be sum up in the following characteristics:

- Tools that allow direct and fluid communication.
- Tools that prioritize effectiveness of time and costs.
- A user-friendly tool adapted to the level of the target group of students that, if possible, is already familiar to the learners.
- A balance between richness of functionalities and effectiveness (the simpler the platform, the less time is wasted in setting up the communication channel and more in the actual exchange between users).

The answers also show that it is not possible to pick a single digital tool that will be the best option for communication and collaboration with all parties of the VET community, rather, it is a question of knowing what to take into account when choosing these digital tools, i.e. knowing the characteristics of who you want to communicate with, what their level of digitisation is and what project or specific function you need this communication channel for. On the other hand, it is important to consider that it is necessary to be constantly learning and renewing your knowledge on the available tools and new communication and collaboration strategies, so that the above statement is possible.

“Q2: How do you seek information to develop your awareness of the latest digital trends in your field of education? What sources of information do you use?”

This second question aims to determine how VET educators are improving their digital pedagogical practices and how are they using digital resources for their continuous professional development.

The answers of the interviewed educators show that they implement a mixture of autonomous researching and assessing online as well as a more formal approach of attending to conference, seminars, and courses. In general, participants get their information from official sources, such as websites of the ministries, academic articles, conferences. Other secondary sources of information can be found on social media: YouTube, Facebook, LinkedIn.

One issue to point out is that most participants do not report collaboration and exchange of experiences with other educators as a way of developing reflective practice, or they report it as a secondary method. This could be an indicator of a lack of digital channels or online opportunities to help educators exchange knowledge and work together to improve their educational practice, and therefore a lack of these competences on the part of teachers.

Dimension 3: Specific Competences

Dimension 3.1: Organisational communication

Organisational communication	To use digital resources to improve the communication with learners, the teaching institutions, and third parties involve in the educational and labour world. Meaning to provide better and more efficient communication, as well as to contribute with and share organizational strategies for communication.
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On one hand, individuals who have this basic competence would rarely make use of digital tools and platforms for communication, and rather prefer to support their communication with learners and the rest of the VET community with analogic solutions. The ones that do make use of it, do it in a very



basic level, they are aware of some resources for digital communication and use them with some of the parties involved in the educational process, i.e., learners, families, stakeholders and third parties of the labour market, colleagues, or support staff.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework adopted in the DigiCompEdu Framework, 2017.

On the other hand, people who reach a reasonable level of competence (intermediate level) can use digital solutions for communication in an effective way and attending to the main principles of security and ethics online. They also choose different digital technologies according to the situations, meaning that they adapt to the needs of the specific target groups and purpose of the communication when choosing the communication technic and tool. In this level, educators have an extensive directory of digital resources, and they consider aspects to adapt to the needs of the recipient.

The intermediate level corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately, people who are fully competent to organise communication strategies and tools, can evaluate and assess the adequacy of communication strategies, and involved other experts in the discussion. They also provide benefits to the recipients of communication that could not be achieved by using more traditional approaches to communication, meaning that they use technology to make processes with colleagues, learners and third parties easier, transparent, and more efficient. The more advance educators can also create and redesigning the adopted communication strategies to improve them for their professional practice and for the leverage of all parties involved in their educational community.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence in using digital technologies for organizational communication and reach a higher level of this specific competence, educators need to:

- To use digital technologies to communicate organisational procedures to learners, i.e., rules, appointments, events, evaluations, programmes, etc.
- To use digital technologies to inform and communicate with learners on an individual basis, meaning using technologies to facilitate the process of providing specific tutoring and recommendations for students.
- To use digital technologies to communicate with colleagues.
- To use digital technologies to communicate with third parties, i.e., experts to be invited, companies and other employers.
- To communicate via official and recognisable channels with possible learners, stakeholders, and others, i.e., corporate, or institutional social media channels and/or websites, e-learning platforms with communication tools incorporated, etc.
- To contribute to collaboratively developing and improving organisational communication strategies for your educational community.

It is important for VET educators nowadays to also be digital facilitators, as they teach in an area that must be highly adapted to the requirements of the labour markets and to have and transfer to their students the digital competences that are required in the world of work, and that employers demand from employees. As we lived in a world that is increasingly globalise and digitalise, every competence required both in education and in the labour market, such as communication skills, must now be adapted to the use of digital technologies.



Dimension 3.2: Professional collaboration.

Professional collaboration	To use ICTs to collaborate with other educators, to improve the exchanges of knowledge and experiences, and to work collaborative in the improvement of teaching techniques and pedagogical approaches.
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On one hand, individuals who have this basic competence would rarely make use of digital tools and platforms for collaboration, and rather prefer to support it with analogic solutions. The ones that do make use of it, do it in a very basic level, they are aware of some resources for digital collaboration and use them to share and exchange practices with their colleagues from their teaching institutions.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework.

On the other hand, people who reach a reasonable level of competence (intermediate level) can use digital solutions to share and exchange good practices and knowledge, and to learn new pedagogical techniques from the educational community beyond their organisation, i.e., using online communities to exchange practices. They also implement digital resources to collaboratively work on new ideas in a more effective and convenient way.

The intermediate level corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately, people who are fully competent to professionally collaborate thought the usage of digital technologies constantly explore news methods and process to improve their teaching, they incorporate the acquired knowledge to their practices, and disseminate the gained experience to help others improve as well. Therefore, they are constantly improving their resources to collaborate online. They also participate in the collaborate process of creating new methods for digital collaboration and share them with their peers.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence in using digital technologies for professional collaboration and reach a higher level of this specific competence, educators need to:

- To use digital technologies to collaborate with other educators in specific projects, to improve their knowledge and practices, and with the goal of improving the collective or individual learning process of common students.
- To use digital technologies to share their experience, knowledge, and new ideas with other colleagues from their organization and beyond.
- To use digital technologies to improve their teaching by learning from other educators, new innovations and techniques that are available in digital educational communities.
- To use digital technologies to collaboratively develop educational resources and improve the learning process of students, involving their peers but also their learners' opinions and those of key stakeholders.
- To use professional collaborative networks to explore and reflect on new pedagogic practices and methods and well as to be up to date with the requirements of employers.

Dimension 3.3: Reflective practice

Reflective practice	To reflect, assess, develop, and improve your own digital pedagogical practices for your individual professional development, but also in the aspects that involve learners and the educational community.
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On one hand, individuals who have this basic competence would be aware of their need to improve and assess their current skills but would have difficulties to identify specific gaps in their practice and/or would not know where to start their professional development journey. The ones that do



actively practice self-reflection and self-improvement do it in a restrictive way, meaning that they do assess their digital and pedagogical practices and improve their development but only know or access a minimum number of digital resources.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework.

On the other hand, people who reach a reasonable level of competence (intermediate level) can use techniques such as peer review and autonomous research to actively improve their digital pedagogical practices. In this level, educators experiment with new digital solutions and support their development by accessing a less or more wide range of digital sources and resources. They also seek for advice and attend to seminar and courses.

The intermediate level corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately, educators who are fully competent in reflective practice, continuously enhance and improve both their digital and pedagogical skills, renew the repository of digital resources and communities where it is possible to improve their practice, and incorporate the latest innovations and research findings to their teaching. They also help peers from their organizations and beyond to improve their development as educators. The more advance educators develop research and innovative process regarding digital and pedagogical practices, that they incorporate to their teaching and continuously improve.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of reflective practice of educators by using digital technologies educators need to:

- To critically reflect on their own digital and pedagogical practice, what are their gaps and where they need to improve.
- To know where to find ways of self-development and how to research and be up to date with new and innovative techniques regarding the improvement of their practice.
- To develop a repository of resources and online communities that is in constant growth and will facilitate the process of constant improvement, as well as to invite other colleagues.
- To know and access specific training for their needs regarding digital and pedagogical opportunities.
- To collaborate with their peers to exchange knowledge and help each other in their development journey as educators and digital facilitators.
- To provide feedback and/or actively contribute to developing organisational practices, policies, and ideas on the use of digital technologies.

Dimension 3.4: Digital Continuous Professional Development (CPD)

Digital Continuous Professional Development (CPD)

To use digital resources for your continuous professional development as an educator.

On one hand, individuals who have this basic competence would make little use of the Internet to update their knowledge. The ones that do actively include online sources do it in a restrictive way, meaning they do not update the sources they research on, but they do access the internet for updating their knowledge in their subject and/or pedagogical approaches.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework.

On the other hand, people who reach a reasonable level of competence (intermediate level) can use the internet to search for seminar, conferences and courses that will allow them to continuously



develop professionally. Some of them also attend to webinars and online course, access online materials and tutorials. They do not only use the internet to search for learning opportunities but engage in learning online.

The intermediate level corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately, people who are fully competent in regard to digital continuous professional development (CPD) consult a wide range of resources and websites that allow them to be up to date with the latest learning opportunities, that they assess critically to learn in the most fruitful and effective way possible. They consider their teaching style, target group of learners and subject specific requirements when choosing a course, seminar or downloading some learning material. They also participate in online training and actively exchange knowledge with peers. The more advance educators are the ones that provide the continuous learning opportunities to others by creating their own online communities, websites, material and resources or courses.

In a nutshell, to improve their Digital Continuous Professional Development (CPD) capabilities and reach a higher level of this specific competence, educators need to:

- To identify training and professional development sites that provide training opportunities that are adequate for the educator specific characteristics, considering their field of teaching and their own professional development needs.
- To successfully search for sources and resources online that provide training and to assess their quality and effectiveness correctly.
- To use digital professional communities as a source of professional development.
- To use online training opportunities, e.g., seminars, video tutorials, courses, webinars, etc.
- To use digital environments to provide training opportunities for other educators, i.e., courses, seminar, blogs, websites, etc.

Area of competence 2: Digital Resources

Dimension 1: What is and why is important to introduce digital resources for educators?

The expectations of society for high-quality educational services must be considered in today's educational processes, along with trends in science and technological progress. Purposeful use of digital educational resources is perhaps one of the most efficient methods.

Digital resources are the applications (apps), software, programs, or websites that involve students in learning activities and support their learning objectives. Furthermore, digital resources can be defined as materials that have been conceived and created digitally or by converting analogue materials to a digital format.

Any instructional content that is kept on digital media is referred to as a digital educational resource. According to L. L. Bosova's (n.d.) definition of the term, "digital educational resources" means "Digital educational resources necessary for the educational process and to the digitized resources, namely, photographs, video sequences, static and dynamic models, role-playing, objects, objects of virtual reality and interactive modelling, maps, sound recordings, symbolic objects and business graphics, text documents and other educational materials selected in accordance with the content of a specific tutorial attached to lesson planning and provided with necessary methodical recommendations".

In the framework of updating and transforming the worldwide educational environment, digitalization of education is a powerful trend. All forms of information (texts, sounds, visual pictures, videos, and other data) must be converted to a digital language to be considered digital.



Digital resources competences imply:

Selecting digital resources	To find, evaluate, and choose digital materials for education. While choosing digital resources and organizing their use, to consider the learning purpose, setting, educational method, and learner group.
Creating and modifying digital resources	To add to and make modifications to already-existing openly licensed materials and other resources where it is allowed. To develop new digital learning materials alone or in collaboration. When creating digital resources and organizing their use, to consider the learning purpose, setting, pedagogical method, and learner group.
Managing, protecting and sharing digital resources	To arrange digital information so that students, parents, and other educators may access it. Properly safeguard delicate digital material. Should adhere to and properly enforce copyright and privacy laws. To comprehend the production, usage, and correct attribution of open licenses and open educational materials.

Currently, there are several digital (educational) materials available to teachers that they may use for their lessons. Understanding this variety, effectively identifying resources that best suit their learning objectives, learner group, and teaching style, structuring the wealth of materials, establishing connections, and modifying, expanding, and developing their own digital resources to support their teaching are all critical competencies that educators must develop (DigCompEdu, 2017).

They must also understand how to utilize and handle digital information appropriately. When using, changing, and sharing materials, they must adhere to copyright laws and safeguard private information like grades or digital tests. Access to technology, professional development (PD) in the use and integration of digital resources, time constraints, limited opportunities to find and adapt digital resources, and traditional teaching methods that frequently do not prioritize equitable instruction or the support of diverse learners are additional challenges.

Digital educational resources are re-engineering the vocational education system, increasing the proportion of active learning. The immediate demands of students engaged in independent study of the course's theoretical content are addressed by the electronic educational tools provided by professors. Additionally, digital resources are created as a tool for students to use to improve their digital capabilities, which are crucial for students to have in the 21st century (Volkodav 2021).



Source: eLearning Industry

Dimension 2: Needs assessed in VET educators

Teachers today have access to a multitude of digital (educational) materials that may be used in their lessons. One of the key skills any educator needs to develop is the ability to deal with this variety, to efficiently identify resources that best suit their learning objectives, learners' group, and teaching style, to structure the wealth of materials, establish connections, and modify, add to and develop their own digital resources to support their teaching.

VET workers, NGO staff and E-learning associations have been asked a series of questions in order to depict their opinions about digital resources they choose to use in professional contexts. This section of the interview required respondents to give information on the factors that are taken into consideration when choosing digital tools: "Which aspects do you take into consideration when selecting a specific digital tool (e.g., the learning objective, the context, the learners' group)?"

The most common answers can be divided into two categories: pedagogical approach and features of educational tools.

Pedagogical approach

The majority of those who responded to this item felt that it is substantial to choose digital resources in accordance with pedagogical principles. The overall responses to this question focused on choosing educational digital tools depending on the lesson aim, such that they facilitate its achievement. Moreover, educational digital tools are chosen in conformity with learners' needs and characteristics: age, preferences, previous knowledge and existing digital skills. Another interviewee alluded to the notion of "autonomous learning" that describes educational digital tools that allow students to learn without trainers' directions.

Features of educational tools

In response to the question, most of those surveyed indicated that accessibility is one of the key principles when choosing an educational digital tool. In addition to this, the price of the educational digital tools is vital, the favourite ones being those which are free. As well, it is



major that all the students can access the digital resources, no matter the devices they possess or the Internet connection they have. Furthermore, the majority opted for digital resources with user-friendly interface. In the end, another aspect that is taken into consideration when choosing educational tools is its language. When both categories (trainers and students) have language skills, then they have access to a larger number of educational resources.

It can be seen from the data above that choosing digital resources is not a simple decision. It must respond to a series of characteristics to be accessible for both teacher and students. As a teacher, it is imperative to choose a tool that best respects the pedagogical principles to positively respond to the goal of the lesson and students' needs. As a student, it is mandatory to have a useful tool and be able to use it.



Dimension 3: Specific Competences

Dimension 3.1: Selecting digital resources

Selecting digital resources	To find, evaluate, and choose digital materials for education. While choosing digital resources and organizing their use, to consider the learning purpose, setting, educational method, and learner group.
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On one hand, individuals who have this basic competence would make little use of the internet to find resources. They will hardly ever utilize the internet to discover teaching and learning tools. More than that, they can become aware and make basic use of digital technologies for finding resources. Also, they can find digital information that is appropriate for teaching–learning activities and use straightforward internet search techniques. What is more, they are aware of popular educational websites that offer educational materials.

On the other hand, people who reach a reasonable level of competence, regarding selecting digital resources, identify and assess suitable resources using basic or complex criteria. They can modify the search tactics in response to the outcomes, use relevant criteria to filter results and evaluate the value of digital resources on fundamental standards. Furthermore, they can find, edit, and adapt materials, such as games and/or applications, focusing on the applicability to the target learner audience and their particular learning goal. Moreover, it can be provided criticism and suggestions on selected sources.

Ultimately, people who are fully competent to select digital tools can comprehensively identify and assess suitable resources, considering all relevant aspects and promoting the use of digital resources in education. These people assess the acceptability and dependability of information using a variety of factors while also confirming its neutrality and correctness. In the end, they can advise colleagues and create their own, properly annotated, and graded library of materials, making it accessible to their co-workers.

In a nutshell, to properly select digital resources and reach a higher level of this specific competence, educators need to evaluate the quality of the digital learning resources following the next sections:

- academic quality: information reliability and relevance;
- pedagogical quality: pedagogical formulation, construction, strategies and assessment methods;
- didactic quality: veracity of learning activities and content of the educational tool;
- technical quality: design, browsing, technological ingenuity.

The number of digital learning tools is rising quickly because of the opportunities provided by information and communication technology (ICT) in today's classrooms. When using digital learning resources, learning takes place in a very different environment than when using conventional learning resources, where human interactions are mediated. Careful attention to the quality of the given digital material is especially crucial in these new settings when the student is alone in front of the computer.

Dimension 3.2: Creating and modifying digital resources

Creating and modifying digital resources	To add to and make modifications to already-existing openly licensed materials and other resources where it is allowed. To develop new digital learning materials alone or in collaboration. When creating digital resources and organizing their use, to consider the learning purpose, setting, pedagogical method, and learner group.
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On one hand, individuals who have this basic competence would create and modify resources using basic tools and strategies. They occasionally use digital materials, but they don't normally modify or



produce my own. Once this competence is better reached, they can create and edit worksheets, tests, and digital slideshows for teaching reasons.

On the other hand, people who reach a reasonable level of this specific competence, can create, and modify digital resources using some advanced features. They can adjust the digital learning resources to the learning context and make some fundamental changes, such as modifying or removing pieces. Moreover, they can adapt advanced digital resources to a concrete learning context, such as mixing and creating existing materials to design learning activities for a specific learning context, objective, and learners' characteristics.

Ultimately, people who are fully competent to create and modify digital resources can create, co-create, and modify resources according to the learning context, using a range of advanced strategies. They use a range of sources outside search engines, such as official repositories, collaborative platforms, etc. Furthermore, they assess the acceptability and dependability of information using a variety of factors, while also confirming its neutrality and correctness. In the end, they can create complex, interactive digital resources and develop their own applications and games.

In a nutshell, to reach a higher level of creating and modifying digital resources, educators need to improve the outcome of a series of activities, such as:

- Provide effective searching methods in order to locate digital resources for research, teaching, and learning;
- Consider the unique learning context and learning purpose and choose appropriate digital resources for teaching and learning;
- Assess the authority and dependability of online sites and materials;
- Take into account any limitations that may apply to the usage or reuse of digital resources (such as copyright, file type, technological specifications, legal constraints, and accessibility);
- Evaluate the effectiveness of digital resources in meeting the learning purpose, the selected pedagogical technique, as well as the competency levels of the specific learner group.

Technology now plays a crucial part in the instructional processes in the modern era of learning. Most educational resources today are “born digital,” meaning that they are physically digital files before they are put into print or any other format. This emphasises the importance of educators' competence to create and modify digital resources to achieve the lessons' aims and facilitate the teaching-learning process both for trainers and trainees.

Dimension 3.3: Managing, protecting, and sharing digital resources

Managing, protecting and sharing digital resources	To arrange digital information so that students, parents, and other educators may access it. Properly safeguard delicate digital material. Should adhere to and properly enforce copyright and privacy laws. To comprehend the production, usage, and correct attribution of open licenses and open educational materials.
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Managing, protecting, and sharing digital resources means arranging digital information so that students, parents, and other educators may access it. properly protect sensitive digital material. To adhere to and properly enforce copyright and privacy laws. To comprehend the production, usage, and correct attribution of open licenses and open educational materials.

On one hand, individuals who have this basic competence would not employ strategies for sharing resources. They can organize and save digital materials for later use. Moreover, they would create and modify resources using basic tools and strategies. These people can provide links or email attachments with instructional information, and they are aware that some materials made available online are protected by copyright.



On the other hand, people who reach a reasonable level of this specific competence, can effectively share, and protect resources using basic strategies. They can disseminate instructional information in virtual learning settings by uploading, sharing, or embedding. Also, they can successfully preserve sensitive material, such as tests and student reports. Moreover, they are aware of the copyright policies governing the digital materials (including photos, text, audio, and video) used for academic purposes. Once this competence is better reached, people professionally share resources. They can distribute materials by integrating them into digital settings, implement access restrictions, secure data, and accurately cite works that are protected by copyright.

Ultimately, people who are fully competent to manage, protect and share digital resources can create, co-create, and modify resources according to the learning context, using a range of advanced strategies. To accomplish it, they assemble thorough digital material archives and make them accessible to students or other instructors. Furthermore, they grant licenses to the online resources. In the end, they professionally publish self-created digital content. These people can annotate the digital materials they distribute, making it possible for others to review, comment on, edit, rearrange, or contribute to them.

In a nutshell, to reach a higher level of creating and modifying digital resources, educators need to improve the outcome of a series of activities, such as:

- Where allowed, alter and change already-existing digital content;
- If it is allowed, to merge and mix already-existing digital content or portions thereof;
- Develop fresh digital learning materials;
- Collaborate on the creation of digital learning tools;
- When modifying or developing digital learning resources, should take into account the individual learning purpose, setting, pedagogical method, and learner group;
- Comprehend the many licenses that are applied to digital materials and the effects on their reuse.

In the era of the internet, digital tools and applications make it simpler for teachers to include their pupils in their lessons and incorporate new forms of collaboration and learning. The instructors are able to acquire data through the usage of these edtech solutions and so there is the responsibility to manage, protect and share it properly.



- Learning is active.
- Learning is the product of Environment.
- Learning is both individual and social.
- Learning is Purposeful.
- Learning is organising experience.

Teaching and learning go together. Effective teachers continually improve their skills by learning about the latest trends in the field of education.

Teaching is the process of imparting information. Learning is the process of receiving knowledge as evidenced by a positive or negative change which lasts for a long time. Teaching is attributed with more authority, autonomy, and expertise. Teaching and learning policy promote best practice and establishes consistency in teaching and learning across the whole school. It aims to ensure that all children are provided with high quality learning experiences, leading to a consistently high level of pupil achievement and attitude.

Digital education is the innovative use of digital tools and technologies during teaching and learning and is referred to as Technology Enhanced Learning (TEL) or e-Learning. Digital tools and platforms are becoming more integral to our personal and working lives. Digital learning increases access to education and knowledge while empowering students with a mindset and capabilities that sets them up for success in their present and future. To support both teaching and learning, technology infuses classrooms with digital learning tools, such as computers and handheld devices; expands course offerings, experiences, and learning materials; supports learning 24 hours a day, 7 days a week; builds 21st century skills; increases student engagement and offers them with:

- Efficiency. Online learning offers teachers an efficient way to deliver lessons to students.
- Accessibility of Time and Place.
- Affordability.
- Improved Student Attendance.
- Suits a Variety of Learning Styles
- Technology Issues
- Sense of Isolation.
- Teacher Training

In many studies it is reported that online learning could increase student participation, improve discussion quality, and foster online interactions. The discussion forum could support students and improve learning by solving difficult problems. Well known examples include social media, online games, multimedia, and mobile phones. Digital learning is any type of learning that uses technology. It can happen across all curriculum learning areas.

The scope of how digital products and services can be used for educational purposes is limitless, and it has some incredible benefits for students, such as immersive learning, accessible long-distance learning, or a personalised education experience, among others.

According to the DigiCompEdu Framework (2017), we can the following digital competencies for educators in Assessment:

Teaching

To preparing lesson plans enhanced with digital tools and resources and to use them efficiently in the process of teaching. To use digital tools to motivate and engage them in the lesson actively. Using new technologies in the school subjects makes digital born students more active and participating in the courses and this will lead teachers to develop new formats and pedagogical methods for



	instruction.
Guidance	To use digital technologies and services to enhance the interaction with learners, individually and collectively. To guide and assist the students timely while using digital technologies. To develop new forms and formats for a better guidance and support.
Collaborative Working	To use digital technologies to foster and enhance learner collaboration. This enables learners to use digital technologies as part of collaborative assignments, as a means of enhancing communication, collaboration, and collaborative knowledge creation.
Self-Regulated Learning	To use digital technologies to support self-regulated learning processes, i.e., to enable learners to plan, monitor and reflect on their own learning, provide evidence of progress, share insights, and come up with creative solutions

Dimension 2: Needs assessed in VET educators

Digital technologies can enhance and improve teaching and learning strategies in many ways. However, whatever pedagogic strategy or approach is chosen, the educator's specific digital competence lies in effectively orchestrating the use of digital technologies in the different phases and settings of the learning process. As one of the parts of this project VET teachers, trainers, workers, NGO staff and e-learning associations in project partner countries (Türkiye, Spain and Romania) were interviewed to collect the vital needs of VET educators in the geographical scope of this project. The target group of this interview have been asked a series of questions to depict their views on Professional Engagement and its influence on using digital technologies in their daily teaching as an educator.

These questions are just to understand the competence and the needs of VET educators, trainers in using digital tools in their teaching and learning activities/ courses. The answers collected from the interviewees in three partner countries are varied and the general inferences of the answers gathered to the 4th question '**How do you design, plan, and implement new digital technologies that help learners self-regulate their own learning? Are you using artificial intelligence, for example?**' are as below.

- The teachers plan their learning activities according to the students' perception, comprehension and learning abilities and they use artificial intelligence due to the content of their teaching and learning topic. However, those teachers mostly prefer to use already planned and designed AI tools rather than designing it by themselves. And they recommend their students to use mobile applications in their tasks and studies.
- Teachers and trainers have an idea on AI and use them (e.g., Siri, DeepL, Google Translate, Write, and Improve, Speak, and Improve etc) in their teaching activities and focus on the importance of AI in this digitalized world. Teachers also use online evaluation tools Quizlet, kahoot in which students can see their own progress.
- Teachers and trainer can learn how to use AI based tools not only by attending at in-service training courses but also by watching tutorial videos several times before implementing it in their courses.

With the beginning of Covid-19 teachers met distant e-learning platforms and many other digital tools of Database, AI and Gamification. Most of the teachers integrated them into their courses but still there are some teachers who either do not show any interest to learn and use them or do not



know them. But all teachers are aware of the importance of using AI, database and gamification apps and tools into their courses to make their learning and teaching more engaging and efficient.

Artificial intelligence is used at a small scale in the participants' educational route. It is implemented through usage of Siri, Alexa, and Cambridge tools, participating directly to the learning process. Artificial intelligence is also indirectly incorporated through other commonly used tools such as DeepL, Google Translate.

In terms of designing, planning, and implementing new digital tools, participants first research what has been done in the field and start building from there.

The 5th question is to understand **how teachers/trainers are designing their learning activities; in a traditional way (teacher-centred) or learner-centred and how do they adapt gamification tools in their courses.** Although there are common approaches in designing learning activities there are slight differences, too.

The teachers know learner-centred lesson plans and participation of students in learning, ensures that what they learn is more permanent and practical. In fact, training is not only about the trainer's delivering learning materials, but about the trainee getting the desired knowledge, skills, and attitudes (i.e., achieving the learning outcomes). Each person has a different learning style and teachers can implement a questionnaire (kahoot, mentimeter, etc) to assess students' learning styles during the first session and design the learning activities according to their learning needs and styles. This will improve students' motivation, engagement, and the participation in the class.

Interviewees from 3 partner countries adopt gamification to their courses specially to improve students' engagement and increase their participation in the course. Teachers are keen on finding the right digital tools and the associated training methods to meet trainees' expectations, learning needs and styles. Although, it is not possible to use digital tools in all courses or in all classes teachers mostly prefer to use them in their courses.

Gamification is used in various forms by the participants. Some have it in mind when building a training as a sequence of stories, some use tools to implement it. In terms of tools and methods, they use animated videos, Kahoots, puzzles, role plays, mobile apps.

The 6th question is to understand **how the teachers encourage students to employ digital technologies for collaborative knowledge sharing (e.g., using blogs, wikis)?**

All Interviewees use using video and audio communication tools (WhatsApp groups, zoom, Moodle platforms, Facebook) to share information, documents, and ideas. Communication improves collaboration and teachers use different types of collaborative tools to assign tasks or projects to students to work in peers or groups. Improving collaboration skill is a very important qualification in professional life. Gaining this skill at school period makes finding a job easier for the students too. For a good communication and collaboration teachers can provide students with a Google Docs or Google Spreadsheets and ask them to answer forum questions and to comment each other' posts. Such activities improve students creative, collaborative skills. Giving the task of creating a simple web page (or a blog) or an account on social media that disseminates the topic to be covered, is usually another good method of collaborative work among a group of students. Besides the topic itself, the students also learn other transversal skills such as teamwork, communication, divulgation skills and digital skills.

Participants encourage collaborative work through setting up communication channels, such as WhatsApp groups, Moodle forums, shared Google docs. Learning via Zoom is also an opportunity for students to work together.

Allowing students to research on a specific topic together is a great way to engage with the subject and to work with others before the teacher offers his notes.



Dimension 3: Specific Competence

Dimension 3.1: Teaching

Teaching To preparing lesson plans enhanced with digital tools and resources and to use them efficiently in the process of teaching. To use digital tools to motivate and engage them in the lesson actively. Using new technologies in the school subjects makes digital born students more active and participating in the courses and this will lead teachers to develop new formats and pedagogical methods for instruction.

Digital education is an innovative use of digital tools and technologies during teaching and learning and often referred to e-learning or technology-based learning. In 21st century it is expected that, since new generations are in a continuous transformation, they are required to have an advanced level of digital competence. The learning habits of 21st century students have been changed. Their needs and circumstances are not the same with the students of 10 years ago. So for the schools at each level and type it is essential that they can learn how to provide an educational, didactic and safe response to the needs of students. And to achieve that schools need to work with the teachers who are updated training and possessing a degree of digital competence to undertake the teaching-learning process of students and to promote the acquisition of key competencies in students.

A teacher at A1 level makes little use of digital technologies for instruction. They either do not know how to use digital tools in school education or use it very rarely. Some teachers use only available classroom technologies, e.g., digital whiteboards, projectors, PCs.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework adopted in the DigCompEdu Framework, 2017.

On the other hand, teachers at (Integrator) B1 or (Expert) B2 have a competence of integrating available digital technologies meaningfully into the teaching process and use digital technologies purposefully to enhance pedagogic strategies. They have the capability of organizing and managing the integration of digital devices (e.g., classroom technologies, students' devices) into the teaching and learning process and also set up learning sessions or other interactions in a digital environment.

The intermediate level corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Teachers who are competent enough to use different type of digital tools in their lesson plans can easily structure their sessions. These sessions can be structured teacher-led or student-led according to the topic of the lesson and learning needs of the students. Student centred and digitally structured lessons will re-enforce the learning objectives. Teachers at leader or Pioneer level can structure and manage content, contributions, and interaction in a digital environment. During their sessions they can also easily evaluate the effectiveness of digitally enhanced teaching strategies and revise their strategies according to it.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell to plan and implement digital devices and resources in school education process and lesson plans administrative should put some objectives and take precautions to enhance effectiveness of teaching interventions. They should orchestrate digital teaching interventions, especially at VET schools to manage the educational system appropriately. In order to realize that the educators need to:

- To use technologies and digital tools in the classroom to support instruction, e.g., smart boards, mobile devices, and classroom devices.
- To reinforce learning objectives with teacher-led or student-led digital activities.
- To prepare and form lesson plans, learning activities and interactions in a digital technological world.
- To prepare digital content and collaborate, communicate, and interact in a digital world.



- To utilize face-to face or virtual educator-led digital interferes to support the learning objectives.
- To adjust methods and strategies reflecting on the effectiveness and appropriateness of the digital pedagogical strategies.
- To use innovative and pedagogical methods in their teaching way. (e.g., flipped classroom-project-based learning).

In the 21st century all teachers, especially VET teachers and trainers should be kept on the track in digital education and keen on applying and implementing digital tools in their courses. Because VET sector is huge and VET students should be equipped with the needs of labour markets and the world of work. Teaching and learning how to adapt digital tools into your courses or how to apply it into your topic, especially with project-based learning method will lead to real learning.

Dimension 3.2: Guidance

Guidance To use digital technologies and services to enhance the interaction with learners, individually and collectively. To guide and assist the students timely while using digital technologies. To develop new forms and formats for a better guidance and support.

On one hand, teachers who have this basic guidance competence make little use of digital technologies for interacting with students. To interact with their students, they employ basic digital strategies. They either do not communicate with their students, or communicate very rarely through digital means like email, chat, texting to respond their questions or assignments.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework adopted in the DigCompEdu Framework, 2017.

Digital technologies are perfect means of interaction with the students, and this enhances monitoring and guidance as well. Interacting with learners in the collaborative digital environments is a perfect means of monitoring their behaviour and providing individual guidance and support as needed. Teachers and trainers should experiment new forms and formats for offering guidance and support, using digital technologies.

The intermediate level corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately, teachers who are competent to employ digital technologies strategically and purposefully to provide guidance and support can set up learning activities in digital environments. They can foresee students' needs for guidance and cater for them, e.g. with a help or FAQ section, or with video tutorials. Teachers can easily monitor students' working or his/her behaviour digitally and then they can offer guidance whenever needed. Digital guidance gives you many opportunities to be more objective and act and monitor the students like a fly on the wall. And new need may lead to develop new forms and formats for offering guidance and support, using digital technologies.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence in using digital technologies for guidance and reach higher level of this specific competence, educators need to:

- To use digital communicative tools to give respond answers to the students' questions, assignments, performance, or project works.
- To a better guidance to foresee the students' needs and set up learning activities according to their needs.
- To interact with students in collaborative digital world.
- To monitor students digitally during the learning activities and guide them whenever they need.



Guidance, especially the digital guidance is highly important at school and in social life. Teachers can assign school homework, projects, or any tasks to students. It is easier for VET teachers to assign immediate tasks to students at ateliers or classes. Teachers can monitor students' behaviour and working discipline digitally and can also learn more about the development of students' soft skills.

At digital guidance teachers can be a fly on the wall and this will give a perfect chance to monitor the students and get their real needs.

Dimension 3.3: Collaborative Working

Collaborative Working

To use digital technologies to foster and enhance learner collaboration. This enables learners to use digital technologies as part of collaborative assignments, as a means of enhancing communication, collaboration, and collaborative knowledge creation.

Teachers who have this basic competence make little use of digital technologies in collaborative learning activities. They never or very rarely think about how students could use digital technologies in their assignments or activities that should be done collaboratively. At such circumstances teachers should encourage students to use collaborative digital tools to realize their assignments and presentations.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework.

According to CEFR framework in the next level the teachers are expected to implement digital technologies into the design of collaborative activities to support collaborative learning. Teachers can design and set up collaborative activities for students to exchange information or realize tasks; digital presentations, videos, ebooks, e-newspapers, wikis, moodle, teams, google meet, websites or blog posts. While students are working collaboratively in digital environment teachers can monitor and guide them digitally, too. During collaborative work students can receive and give peer-feedback and also do self-assessment.

The intermediate level corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

On the other hand, teachers use digital technologies to innovate and develop students' collaborative learning and peer assessment. At this level teachers can design and manage various collaborative learning activities in which students collaboratively conduct research, document findings, and reflect on their virtual or face-to-face learning. During collaborative learning teachers can monitor and guide students and at the same time collaborative learning is a perfect environment to get peer and self-assessment.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence in designing and setting digital technologies for collaborative learning, the educators need to:

- To implement collaborative learning activities in which digital devices, resources (e.g., wikis, blogs, LMS) or digital information strategies are used.
- To make use of collaborative digital tools to exchange knowledge among students and colleagues.
- To monitor and guide students while they are realizing learning activities/tasks collaboratively and assists and give guidance whenever needed.
- To use digital evaluation and assessment tools for peer-feedback and support for collaborative learning.

Dimension 3.4: Self-Regulated Learning

Self-Regulated To use digital technologies to support self-regulated learning processes, i.e., to



Learning	enable learners to plan, monitor and reflect on their own learning, provide evidence of progress, share insights, and come up with creative solutions.
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Understanding the way of their own learning and taking the responsibility of their own learning are very important skills. And digital tools improve the self-regulated learning via activities or tasks. At this level teachers either do not or rarely consider how students could use digital technologies in self-regulated activities or assignments and encourage them to use digital technologies to support their individual learning activities and assignments, e.g., for information retrieval or presenting results.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework.

Integrator and expert teachers have the capability to implement digital technologies into the design of self-regulated learning activities and use them to comprehensively support self-regulated learning. At this level teachers encourages students to use digital technologies to collect evidence and record progress in producing video or audio recordings, photos, texts, e-portfolios, learner's blogs, etc. Such digital learning and teaching activities also allow students to manage and document all stages of their learning, e.g. for planning, information retrieval, documentation, reflection and self-assessment. With the support of digital technologies teachers also help students to develop, apply and revise criteria for self-assessment, with the support of digital technologies.

The intermediate level corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately, teachers who have competence in using digital technologies can easily foster self-regulated learning and can develop various and innovative digital formats or pedagogies for self-regulated learning. In addition, they foster their self-regulated learning and enhance their strategies. Developing digital skills improves hard skills as well as soft skills both for teachers and students in this digital world.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence of developing innovative digital formats or pedagogies for self-regulated learning, the educators need to:

- To use digital technologies (e.g., blogs, diaries, planning tools) to allow learners to plan their own learning.
- To use digital technologies to allow learners to collect evidence and record progress, e.g., audio or video recordings, photos.
- To use digital technologies (e.g., ePortfolios, learners' blogs) to allow learners to record and showcase their work.
- To use digital technologies to enable learners to reflect on and self-assess their learning process.

Area of competence 4: Assessment

Dimension 1: What is and why is important to foster Assessment competencies in educators?

Assessment and evaluation have been key parts of teaching and learning from centuries, nevertheless they have been notoriously used incorrectly to measure the knowledge memorized by students instead of a way to monitor their development and skills gained. At the same time, these two concepts have been confused and used as synonyms on many occasions, when evaluation is just one part of the process of assessment. To continue with a delimited definition of what is assessment we will take the definition of Brown (1990), that describes assessment as a process that includes four basic components:

- 1.** Measuring and assessing improvement over time.

2. Motivating students to learn.
3. Evaluating the teaching methods.
4. Ranking the students' capabilities in relation to the whole group evaluation.

As said before, Assessment is a significant part of education and therefore it is very important to integrate digital technologies into this process but considering that it is vital to enhance and improve existing assessment techniques and incorporate digital technologies just when it is necessary. Technology must always be a supporting tool for teaching and learning and not a burden for students or educators that hinders or generalise the process of assessment.



Source: Digitalbizmagazine

In addition, digital resources can be used to make the process of assessment easier and faster, to make it more creative for students, to assess aspects that would be impossible without it, to monitor the learner progress in a more effective way and to provide feedback between educators and students to each adjust their approaches to teaching and learning consequently.

According to the DigiCompEdu Framework (2017), we can the following digital competencies for educators in Assessment:

Assessment strategies	To use digital technologies for formal assessment. To enhance the diversity and adaptability of assessment processes.
Analysing evidence	To generate, collect, critically analyse, and interpret the results of learners. To monitor the progress and performance of learners in a more accurate and diverse way using digital technologies.
Feedback and planning	To use digital technologies to provide better, more personalized, and timely feedback to learners. This means to provide learners with advice based on their performance, and to monitor the incorporation of said advice. To enable learners to understand the evidence provided by digital technologies and use it for decision-making.

Dimension 2: Needs assessed in VET educators

The VET educators, NGO staff and e-learning associations individuals interviewed during the project to gather the level of competencies in the VET community of educators, have been asked a series of questions to depict their views on Assessment and how it's influence by digital technologies in the day-to-day practice of an educator.

Participants in the interview answered two key questions in relation to this area of competence:

“Q1. How do you store and manage data (i.e., on students’ academic progress, timetables)?”



This question was used to determine how educators of the three analysed countries manage the assessment and storing of data from their learners. The responses show that most participants use Excel to store the data. However, where the opportunity for an e-portal is being given, participants choose to use it. With Moodle, participants can track very easily the progress of a course. Other tools to collect and store data: Google Forms, Doodle, Mentimeter, MailChimp.

In general, educators choose different digital resources to assess students' progress and store the data collected depending on the educator level of digital skills, accessibility given, i.e., some courses have a e-learning platform associated that provides sufficient assessment functionalities; and the specific needs determine by the course specific learning objectives and level of complexity.

“Q2. Do you perform data analysis? How do you use data to inform your decision-making?”

This question aims at determining at what level are educators analysing the data obtained from students through digital technologies, as well as how are they using this information to further improve their teaching and general decision making. The results show that participants perform analysis of data in Excel, or analyse the results generated from Moodle or other e-learning platforms used. The results are reflected upon or even discussed with other teachers and students to find solutions to any problem that might arise.

The overall results of the interviews performed with VET educators and trainers show that they have a basic and intermediate level of competencies in relation to assessment. Some of the issues that were raised and that might be the reason for the lack of more advance competencies are: lack of time to research more complex techniques and resources for data analysis, the diverse needs of the different courses that they teach as well as among their students, which makes the process of depurating once specific strategy for assessment and data analysis more difficult, and the lack of information available on courses and other learning opportunities to improves these competences.

Dimension 3: Specific Competences

Dimension 3.1: Assessment strategies

Assessment strategies To use digital technologies for formal assessment. To enhance the diversity and adaptability of assessment processes.

On one hand, individuals who have this basic competence would rarely make use of digital tools and platforms for assessment activities, and rather prefer to use analogic solutions. If they do make use of digital technologies to assess students it is often for creating assessment tasks or tests that are later provided in paper to learners, i.e., for creating a test easier or to provide a calendar for students with the deadlines of tasks.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework adopted in the DigiCompEdu Framework, 2017.

On the other hand, people who reach a reasonable level of competence (intermediate level) can use existing digital solutions for formative assessment, i.e., digital quizzes, e-portfolios, games, and they can adapt or choose a specific tool according to their learning objectives and the goal of the assessment. Some have a wider range of options, tools, and *software* that they can implement depending on the requirements and target group needs, they can also properly analyse the adequacy and quality of the tools they implement.

The intermediate level corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately, people who are fully competent to implement digital assessment tools and processes can adopt, modify, and create their own digital assessment formats. They can calculate the impact of using digital technology for assessing students and determine in which situations the digital approach



is more beneficial. A more advance group of educators can develop innovative digital assessment formats, using digital technologies, and sharing them with their teaching community.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence in using digital technologies for assessing learners and their progress and reach a higher level of this specific competence, educators need to:

- To use digital assessment tools to monitor the progress of learners and obtain data regarding their performance.
- To use digital technologies to enhance and improve formative and summative assessment strategies, i.e., making it more attractive to learners, providing more effective ways of collecting results, etc.
- To use of a variety of digital and non-digital assessment formats and to understand how to use them appropriately to benefit students and not to simply for the sake of implementing technology, meaning to critically assess the adequacy and quality of tools and strategies used.

Dimension 3.2: Analysing evidence

Analysing evidence	To generate, collect, critically analyse, and interpret the results of learners. To monitor the progress and performance of learners in a more accurate and diverse way using digital technologies.
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On one hand, individuals who have this basic competence would rarely make use of digitally obtained data from their students to monitor their development. If they do make use of digital technologies to assess and monitor students it is often the most basic data that can be obtained both through digital resources and analogically, such as test scores, attendance, interventions, etc. They use the data to provided individual feedback to students.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework adopted in the DigiCompEdu Framework, 2017.

On the other hand, people who reach a reasonable level of competence (intermediate level) use the data obtained through the digital resources or platform provided for these purposes, to monitor their students' progress and activity, and to provide them with direct feedback on their performance. Some of them would go a step further and implement the digital monitoring tools that they find necessary to generate the information they need to monitor their learners.

The intermediate level corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately, people who are fully competent in the analysis of teaching and learning evidence make uses of data collection and assessment to improve the learning strategies of students, reflect on the learning content they create, and the pedagogical techniques used. They often use multiple digital data collection tools, that they choose according to the course and learners needs, and they use this information obtained to provide individual feedback and solutions to students. The more advance educators in the use of analytics will go a step further and implement more advance data generation and visualization processes and discuss and reflect on the adequacy of different methods as well as continuously research to improve their knowledge and continue to include innovations.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence in using digital technologies for analysing evidence and reach a higher level of this specific competence, educators need to:



- To implement processes that allow to generate and collect important data from their students' performances.
- To use digital technologies to collect, organize, visualised, evaluate and measure the significant data collected.
- To analyse and draw conclusion from the evidence collected that will ultimately help the learners improve their capabilities or learning methods, improve the teaching content and approaches, or to identify specific issues and provide solutions.

Dimension 3.3: Feedback and planning

Feedback and planning	To use digital technologies to provide better, more personalized, and timely feedback to learners. This means to provide learners with advice based on their performance, and to monitor the incorporation of said advice. To enable learners to understand the evidence provided by digital technologies and use it for decision-making.
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On one hand, individuals who have this basic competence would rarely make use of digitally obtained data from their students to prove them with feedback and planning. The ones that do make use of digital technologies to inform feedback, tend to provide more basic information on the learner's progress.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework adopted in the DigiCompEdu Framework, 2017.

On the other hand, people who reach a reasonable level of competence (intermediate level) use digital technologies to provide different forms of feedback to students and tries to facilitate the access to the information on learners' performance to the students. They would try to improve the effectiveness of the feedback given by incorporating the usage of digitally obtained data. They would also do a follow-up of the feedback provided to help students plan accordingly and thus improve their learning progress.

The intermediate level corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately, people who are fully competent around feedback and planning would personalise the feedback as well as the follow up support and planning they provide to the individual student, supporting these actions with more advance data assessment techniques that allow them to obtain and assess more information in a more efficient way. They would also use the data obtained to reflect on their teaching, and some of these educators would make improvements to their teaching strategies based on the information collected through digital assessment, and thus continuously innovating and adjusting their teaching.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence in using digital technologies for feedback and planning and reach a higher level of this specific competence, educators need to:

- To use assessment management systems and processes to enhance the effectiveness of feedback provision.
- To use digital technologies to monitor learners' progress and provide support when needed, and to individualise this support as much as possible to tailor it to the gaps and needs of everyone.
- To adapt, modify and innovate their teaching and assessment practices, based on the data generated by the digital technologies used.



- To enable learners to evaluate and interpret the results obtained through all kinds of assessments.
- To assist learners in identifying areas for improvement and jointly develop learning plans to address these areas, and to use the information obtained for more long-term decision regarding their choices in education, and career wise.

Area of competence 5: Empowering Learners

Dimension 1: What is and why is important for educators to empower learners?

A change from a learner-centred to a teacher-centred approach, from information transmission and memorization to knowledge acquisition and application, is what defines the postmodern educational paradigm. The student takes an active role in the educational process by learning how to gather knowledge, evaluate it critically and use it ethically and creatively to solve problems that arise in daily life. The educator, in turn, transitions from being a knowledge provider to someone who works with and helps learners.

The inquisitive mind is more satiated than ever before because of improvements in eLearning technology and straightforward search engines like Google. It takes only a few mouse clicks to learn new information and abilities. With the ability to study on their own, individuals are driven to learn more (and more, and more) to be better equipped for a changing work environment. This indicates that they actively and consistently try to comprehend what, why, and how.

The term "empowered learner" now has a broader connotation. An atmosphere and activities that boost one's sense of self-efficacy and energy are provided as part of the empowerment process, which is described as the process of establishing intrinsic task motivation. Motivated and inquisitive, empowered learners see chances for both professional and personal improvement. This indicates that they always strive to improve all facets of their lives.

Digital technologies' capacity to enhance learner-centred pedagogical approaches and increase students' active participation in and ownership of the learning process is one of its primary benefits for education. So, while studying a subject, trying out various possibilities or solutions, comprehending connections, coming up with original solutions, or making an artefact and commenting on it, for example, digital technology may be utilized to support learners' active involvement.

Competencies for empowering learners imply:

Accessibility and inclusion	To make learning materials and activities accessible to all students, including those with special needs. To consider and address learners' (digital) expectations, capabilities, uses, and misunderstandings as well as any environmental, physical or cognitive limitations on how they utilize technology.
Differentiation and personalisation	To utilize digital technology to meet the various learning needs of students, allowing them to progress at varied rates and levels, while adhering to their own unique learning goals.
Actively engaging learners	To encourage students' active and imaginative involvement with a subject topic by using digital technology. To include digital tools into pedagogical approaches that encourage learners to think critically, creatively and employ cross-disciplinary abilities. To expose students to fresh and authentic settings for learning that



Dimension 2: Needs assessed in VET educators

VET workers, NGO staff and E-learning associations have been asked a series of questions in order to depict strategies for responding to their students’ needs when implementing digital instruments. This section of the interview required respondents to give information on the factors that are taken into consideration when identifying students’ needs and abilities: “How do you identify learners’ different needs and abilities (considering physical or cognitive constraints) when implementing digital instruments?”. Moreover, this question has a special focus on those students who present physical or cognitive constraints.

The most common answers focus on the evaluation process, and they can be divided into two categories: the moment of the evaluation and the types of evaluation.

Moment of the evaluation

The majority of those who responded to this item felt that it is suitable to identify learners’ needs and abilities in different moments. This idea conducts to initial and formative evaluation. On one hand, the initial assessment is the process of determining a person's learning and support requirements to enable the creation of a personalized learning plan that will give their education some structure. It establishes the learner's beginning point for their learning program. In order to acquire information that is needed, the trainer takes data through the registration process, surveys, and questionnaires that are filled out before the start of the course. On the other hand, formative evaluation is intended to support the learning process by giving the learner feedback that may be utilized to pinpoint strengths and weaknesses and thereby enhance future performance. ⁴⁶It is agreed that the trainer focuses during the program on the students, identifying their needs. Furthermore, one participant commented that it is necessary to focus on the progress made by each student.

Types of evaluation

In response to the question, most of those surveyed indicated that it is viable to discover students’ needs through observation. In the field of education, observation is frequently utilized as a method to enhance learning and growth. The interviewees agree that it is a suitable method for gathering data that may be used to analyse educational contexts, assess the efficacy of instructional strategies, and formulate improvement strategies. Directly asking the students is the alternate method and one of the interviewee’s common answers. This method can be + correlated with metacognition, the process which explains knowledge and understanding of your own thinking.

The overall responses to this question revealed that the correspondents are conscious of some methods to reach out their student’s needs. As well, the interviewees agree that, when discussing about identifying students’ needs and abilities, they take into consideration different moments and different strategies of evaluation.

Dimension 3: Specific Competences

Dimension 3.1: Accessibility and inclusion

Accessibility and inclusion	To make learning materials and activities accessible to all students, including those with special needs. To consider and address learners' (digital) expectations, capabilities,
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⁴⁶ Yambj, T. A. C. (2018). Assessment and evaluation in education. Research Gate. https://www.researchgate.net/publication/342918149_ASSESSMENT_AND_EVALUATION_IN_EDUCATION



uses, and misunderstandings as well as any environmental, physical, or cognitive limitations on how they utilize technology.

On one hand, individuals who have this basic competence would be concerned about inclusivity and accessibility and their related issues. They can be worried that integrating digital tools into the classroom would make it much harder for already underprivileged pupils to engage and stay up with the rest. At the same time, they recognize how crucial it is to give every student access to the same digital tools and that digital technology may help or hurt accessibility

On the other hand, people who reach a reasonable level of this specific competence would address accessibility and inclusivity. They are aware of social and economic disparities caused by access to digital technology as well as how these factors affect how pupils utilize it. Also, they make sure that all the pupils can use the digital tools they employ, being aware of those students who require more help, such as those in need. Moreover, these educators would enable accessibility and inclusivity. It means that they use digital educational tactics that consider the learners' digital surroundings, such as time constraints or the type of device accessible. When choosing, altering, or developing digital resources, they take accessibility into account and address any possible problems. They also offer alternate or compensating tools or techniques for students with special requirements. What is more, they use digital tools and techniques, such as assistive technology, to address the accessibility issues that certain learners, such as visual or auditory disabilities, may have.

Ultimately, people who are fully competent to ensure accessibility and inclusion would enhance both. They can choose and deploy digital pedagogical tactics that are appropriate for learners' technological uses, competencies, expectations, attitudes, and misuses. Also, they can utilize design concepts, such as font size, colour, language, style, and structure, to make materials and digital learning settings more accessible. Furthermore, they can provide innovative strategies for accessibility and inclusion. These people can consider, debate, redesign, and develop approaches for inclusion and equitable access to digital education.

In a nutshell, to reach a higher level of creating and modifying digital resources, educators need to improve the outcome of a series of activities, such as:

- Ensure that all the pupils can use the digital tools that are being used.
- Imply assistive devices for students who require extra help, such as those with physical or mental disabilities or learning difficulties.
- Always keep an eye on how well the accessibility improvement measures that are put in place are working and adjust the approach as necessary.

Taken together, these results suggest that inclusion comprehends people's involvement and empowerment. People are valued and respected when they are included. When they are being their true selves, employees perform at their best. One must feel included in order to be one's true self.

Dimension 3.2: Differentiation and personalisation

**Differentiation
and personalisation**

To utilize digital technology to meet the various learning needs of students, allowing them to progress at varied rates and levels, while adhering to their own unique learning goals.

On one hand, individuals who have this basic competence would be uncertain about the ability of digital technology to differentiate and personalize. They have no information about technologies as an instrument that offers personalised learning opportunities. Also, once they get a little bit more advanced, they would become aware of the possibilities for differentiation and personalization



offered by digital technology. They are aware that digital technologies, such as those that offer activities at various levels and speeds, can assist differentiation and personalization.

On the other hand, people who reach a reasonable level of this specific competence, would employ digital technologies for differentiation and personalisation. They can choose and employ various learning exercises, such as games or quizzes, that let students move at different rates, choose varying degrees of difficulty and/or redo exercises that they didn't complete successfully the first time. Moreover, these educators would also judiciously employ a variety of digital tools to differentiate and personalize. Those people can employ a variety of different digital technologies when creating learning and assessment activities, and I adjust and modify them to take into consideration various requirements, levels, speeds, and preferences. Moreover, they consider diverse learning paths, levels, and speeds when sequencing and putting learning activities into place and nimbly adjust their techniques to suit emerging conditions or demands.

Ultimately, people who are fully competent to ensure accessibility and inclusion, would implement differentiated and personalized learning completely and thoughtfully. In partnership with students and/or parents, they can personalize and create learning plans that let each student use the right digital resources to match their unique learning requirements and preferences. Also, they consider how well the differentiation and personalization are fostered by the teaching tactics used and they adjust their teaching techniques and digital activities accordingly. In the end, they would use digital technologies to differentiate and personalize marketing efforts. As a final stage, these educators can consider, debate, redesign and create pedagogical approaches for individualized learning through the use of digital technology.

In a nutshell, to reach a higher level of creating and modifying digital resources, educators need to improve the outcome of a series of activities, such as:

- Employ digital technology to meet the unique learning demands of each student, such as those with dyslexia, ADHD, or overachievers.
- Consider various learning routes, levels, and rates when creating, picking, and putting into practice digital learning activities.
- Create personalized learning strategies and utilize digital tools to assist them.

With the increased use of technology in classrooms in recent years, individualized learning and differentiated teaching have become popular aspects in the education sector. Nearly everyone agrees that it is advantageous for schools to accommodate more and more the individual requirements of each student.

Dimension 3.3: Actively engaging learners

Actively engaging learners

To encourage students' active and imaginative involvement with a subject topic by using digital technology.

To include digital tools into pedagogical approaches that encourage learners to think critically, creatively and employ cross-disciplinary abilities.

To expose students to fresh and authentic settings for learning that include them in practical tasks, scientific research, challenging puzzles, or other methods to get more actively involved in difficult subject matters.

On one hand, educators who have this basic competence would make little use of digital technologies for learner engagement and would use these very rarely. Also, once they get a little bit more advanced, they would use digital technologies to engage learners. They can make use of digital technology, such as animations and films, to help students understand new ideas in a fun and



engaging way. Also, they can use interesting and stimulating digital learning activities, such as games and quizzes.

On the other hand, people who reach a reasonable level of this specific competence would be encouraging active usage of digital tools by students. They can place the instructional process' active use of digital technology at the centre. Also, they select the resource that will best promote student active involvement in a particular learning setting or with a certain learning purpose. Moreover, they would utilize digital tools to encourage active learning about the subject. In order to build a relevant, rich and successful digital learning environment, they make use of a variety of digital technologies, such as addressing various sensory channels, learning styles, and techniques, as well as methodologically modifying activity kinds and group compositions. Furthermore, they consider how well the instructional techniques used to promote active learning and learner engagement.

Ultimately, people who are fully competent to ensure accessibility and inclusion would put into practice active learning methodologies completely and critically. They can choose, create, utilize, and coordinate the usage of digital tools in the learning process based on how well they can encourage students' active, imaginative, and critical engagement with the subject matter. Also, they consider how effective the many digital tools they employ are boosting students' active learning and they modify their techniques and decisions as necessary. In the final stage, trainers are supposed to develop new digital methods for active learning. They can consider, talk about, redesign, and create new pedagogical techniques for getting students to actively participate.

In a nutshell, to reach a higher level of creating and modifying digital resources, educators need to improve the outcome of a series of activities, such as:

- Utilize digital tools to create interesting and stimulating visualizations and explanations of new ideas.
- Use interesting and compelling digital learning environments or activities.
- Place the active use of digital tools by students at the heart of the teaching process.
- To choose the best digital tools for a certain learning situation or a particular learning goal to promote active learning.

In general, therefore, it seems that active learning is an important technique in the modern classroom, especially with the various benefits and opportunities it brings. Active learning supported by the development of digital skills is crucial for learners in the digital world.

Area of competence 6: Facilitating Learners' Digital Competence

Dimension 1: What and why is it important to Facilitate Learners' Digital Competence?

In case of European policy recommendations there are two slightly different definitions of 'competence'. In the Key Competences Recommendation, 'competence' is defined as a combination of knowledge, skills and attitudes appropriate to the context (European Parliament and the Council, 2006). In the European Qualifications Framework recommendation, 'competence' is seen as the most advanced element of the framework descriptors and is defined as the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. Furthermore, in the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy (European Parliament and the Council, 2008).



Pixabay

Digital competence means that the teacher has to master communication in the digital environment, share resources and tools, share, interact and participate in communities and networks. It is one of the key competences and refers to the confident and critical usage of the full range of digital technologies for information, communication and basic problem-solving in all aspects of life.

Digital competence is one of the transversal competencies that educators need to instil in learners. Whereas fostering other transversal competencies is only part of educators' digital competence in as far as digital technologies are used to do so, the ability to facilitate learners' digital competence is an integral part of educators' digital competence. It is also considered that "as a transversal competence, digital competence also helps us master other key competences, such as communication, language skills, or basic skills in maths and science.

The following competences are important to facilitate learners' Digital Competence:

Information and media literacy

To know how to reach the correct information at the right source and media literacy are top topics in this digital age and necessary to incorporate learning activities, assignments and assessments which require students to articulate information needs.

Besides teaching school subjects' teachers should also guide students to find information and resources in digital environments. They can also lead students to organise, process, analyse and interpret information to compare and critically evaluate the credibility and reliability of information and its sources.



Digital communication and collaboration

Students need to use digital communication and collaboration tools effectively and in civic participation to incorporate learning activities, tasks, assignments, and assessments. Such activities encourage students to interact through a variety of digital technologies. They can understand appropriate digital communication means for a given context and share data, information, and digital content with others through appropriate digital technologies.

In the global digital world students will be able to seek opportunities for self-empowerment and for participatory citizenship through appropriate digital technologies.

Digital content creation

Students should incorporate digital learning activities, tasks, assignments, and assessments to express themselves through digital means, and to modify and create digital content in different format. Students should be aware of internet rules and ethics how copyright and licenses apply to digital content, how to reference sources and attribute licenses. Creating and editing digital content improves students encourage in realizing their tasks in future, too. They will gain the skill of understanding of how to plan and develop a sequence of understandable instructions for a computing system to solve a given problem or perform a specific task.

Responsible use

Teachers should take measures to ensure students' physical, psychological, and social wellbeing while using digital technologies as well as empowering them to manage risks and use digital technologies safely and responsibly.

Teachers should encourage students to use digital technologies with a positive impact with a creative and critical manner. Although it serves lots of positive effects in our school and social life, digital technology also contains and faces various risks and threats. Students should know internet safety and security measures to protect their personal data and privacy in digital environments to avoid health risks and threats to physical and psychological well-being while using digital technologies

Digital problem solving

Students can identify and solve technical problems or transfer technological knowledge creatively to new situations. Student can identify technical problems when operating devices and using digital environments, and to solve them. They can easily adjust and customise digital environments to personal needs. They can identify, evaluate, select, and use digital technologies and possible technological responses to solve a given task or problem and use digital technologies in innovative ways to create knowledge. With such qualifications students can understand where their digital competence needs to be improved or updated and support others in their digital competence development.

Dimension 2: Needs assessed in VET educators

Digital competence is one of the transversal competences educators need to instil in learners. Whereas fostering other transversal competences is only part of educators' digital competence in as far as digital technologies are used to do so, the ability to facilitate learners' digital competence is an integral part of educators' digital competence.



The 10th Question is how the teachers foster learners' information and media literacy (i.e., encourage learners to express themselves through digital means while avoiding possible dangers like cyberbullying or digital addiction)

The 11 interviewees from 3 project partner countries briefly accept that fostering the use of technologies in the educational environment is different from the use of digital tools or apps in social life, especially during the one's free time. The common idea is that in the virtual classroom environment generally, except very rare events, bullying or misinformation does not occur, as it is fully monitored by the teacher throughout the whole process. The digital tools and e-learning platforms are mostly experienced by the teachers before they are adapted to classroom activities or recommended to students to realize their tasks or project and performance works.

The interviewees make presentations to students and their parents on media literacy, privacy rules and internet ethics, cyberbullying, and digital addiction at the beginning of the educational year. Moreover teachers encourage students to take advantage of digital media, as they are a great source of immediate information, but always stressing the importance of knowing how to filter sources and emphasising that they should always speak with respect and tolerance, as this will be the personal and professional brand that they will build for their future.

When it comes to learners expressing themselves online, all participants encourage them to learn as much as possible about cybersecurity, but also to promote a respectful behaviour. Online platforms, such as Moodle, or even WhatsApp groups, can be managed to avoid conflicts and educate the members through set rules.

Dimension 3: Specific Competences

Dimension 3.1: Information and media literacy

Information and media literacy

To know how to reach the correct information at the right source and media literacy are top topics in this digital age and necessary to incorporate learning activities, assignments and assessments which require students to articulate information needs.

Besides teaching school subjects' teachers should also guide students to find information and resources in digital environments. They can also lead students to organise, process, analyse and interpret information to compare and critically evaluate the credibility and reliability of information and its sources.

At this level teachers make little use of strategies to foster students' information literacy and encourage them to use digital tools to search for necessary information they need. In fact, they do not think much on guiding students to reach reliable source of information or resources.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework adopted in the DigiCompEdu Framework, 2017.

Teachers of these level implements activities to foster students' information and media literacy and use a range of pedagogic strategies for it. Moreover, they use different types of pedagogic strategies to enable students to compare and combine information. Teachers implements learning activities where students can use digital tools to reach correct and reliable information.

This is intermediate level, and it corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

At this level teachers plan their courses with the activities improving students' critical and comprehensive thinking abilities. They use innovative formats to foster students' information and media literacy. Teachers, according to their proficiency level, they reflect, discuss, design and re-



design their innovative pedagogic strategies to create and improve students' awareness on information and media literacy. eTwinning and scientix platforms are great platforms in this sense. Teachers can run international eTwinning projects to improve students' knowledge on media literacy and improve their use of digital tools.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence in using digital technologies for facilitating learners' digital competence and reach a higher level of this specific competence, educators need to:

- To articulate information needs and according to their needs they develop personal search strategies for a better quality of information found.
- To analyse, evaluate and compare the credibility and reliability of sources of data, information, and digital content.
- To organise, store and retrieve data, information, and content in digital environments.

Dimension 3.2: Digital communication & collaboration

Digital communication and collaboration

Students need to use digital communication and collaboration tools effectively and in civic participation to incorporate learning activities, tasks, assignments, and assessments. Such activities encourage students to interact through a variety of digital technologies. They can understand appropriate digital communication means for a given context and share data, information, and digital content with others through appropriate digital technologies.

In the global digital world students will be able to seek opportunities for self-empowerment and for participatory citizenship through appropriate digital technologies.

At this level teachers show their progress by making little use of strategies fostering learners' digital communication and collaboration and encourage them to use digital technologies for communication and collaboration. While some of the teachers do not or very rarely think of fostering students' digital communication and collaboration some teachers really encourage their students to use digital technologies to interact with other students, with their teachers or trainers, management staff and third parties.

The basic level corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework adopted in the DigiCompEdu Framework, 2017.

On the other hand, some teachers show their progress by implementing various educational activities to foster students' digital communication and collaboration. And while preparing these activities they use different range of pedagogies. Those learning activities are mostly based on using digital tools for communication and teachers guide students in respecting behavioural norms, appropriately selecting communication strategies and channels, and being aware of cultural and social diversity in digital environments. Teachers who are more skilful at this level use a range of different pedagogic strategies in which students use digital technologies for communication and collaboration. Such teachers support and encourage students to use digital technologies to participate in public discourses and to use digital technologies actively and consciously for civic participation.

This is intermediate level, and it corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

On the other hand, more skilful teachers on digital communication and collaboration incorporate assignments and learning activities which require learners to use digital technologies for communication, collaboration, knowledge co-creation, and civic participation effectively and



responsibly. They critically reflect on how suitable their pedagogic strategies are in fostering learners' digital communication and collaboration and adapt their strategies accordingly and due to that reflection, they discuss, re-design and innovate pedagogic strategies for fostering learners' digital communication and collaboration.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence in using digital technologies for digital communication & collaboration competence and reach a higher level of this specific competence, educators need to:

- To know the appropriate and the right digital communication tools to interact, share data and information and digital content.
- To know referencing and attribution practices and participate in society using public and private digital services.
- To seek opportunities for self-empowerment and for participatory citizenship through appropriate digital technologies.
- To use digital tools for collaborative learning activities.
- To use digital tools to be aware of behavioural norms.
- To be aware of cultural and generational diversity in digital environments and to adapt communication strategies to the specific audience.
- To be able to use more than one digital identity and protect them.

Dimension 3.3: Digital content creation

Digital content creation

Students should incorporate digital learning activities, tasks, assignments, and assessments to express themselves through digital means, and to modify and create digital content in different format. Students should be aware of internet rules and ethics how copyright and licenses apply to digital content, how to reference sources and attribute licenses. Creating and editing digital content improves students encourage in realizing their tasks in future, too. They will gain the skill of understanding of how to plan and develop a sequence of understandable instructions for a computing system to solve a given problem or perform a specific task.

At this level while some teachers encourage students to use digital content creation by producing texts, images, and videos but some of them do not or only very rarely consider about it.

This is the basic level that corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework adopted in the DigiCompEdu Framework, 2017.

On the other hand, teachers implement educational activities in which students use digital tools to produce digital content, e.g., in the form of text, photos, other images, videos, etc. They encourage learners to publish and share their digital productions. Some more skilled teachers at this level use different pedagogic strategies to enable students to express themselves digitally, e.g., by contributing to wikis or blogs, by using ePortfolios for their digital creations. They encourage and enable students to understand the concept of copyright and licenses and how to re-use digital content appropriately

This is intermediate level, and it corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately some teachers detect and counteract plagiarism, e.g., in using digital technologies. They critically think on the suitability of their pedagogic strategies in fostering their students' creative digital expression and adapt their strategies to it appropriately. They guide their students in designing, publishing, and licensing complex digital products, e.g., creating websites, blogs, games or



apps. And according to the feedback of students and the evaluation of how effectiveness of the implied formats teachers improves it.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence in using digital content competence and reach a higher level of this specific competence, educators need to:

- To prepare and edit digital content in different formats and use them to express themselves.
- To modify, refine, improve, and integrate already existing and necessary knowledge.
- To develop original and content relevant modules and know how copyright and licenses apply to data, information, and digital content.
- To plan and develop understandable instructions for a computing system to solve a given problem or perform a specific task

Dimension 3.4: Responsible use

Teachers should take measures to ensure students' physical, psychological, and social wellbeing while using digital technologies as well as empowering them to manage risks and use digital technologies safely and responsibly.

Responsible use

Teachers should encourage students to use digital technologies with a positive impact with a creative and critical manner. Although it serves lots of positive effects in our school and social life, digital technology also contains and faces various risks and threats. Students should know internet safety and security measures to protect their personal data and privacy in digital environments to avoid health risks and threats to physical and psychological well-being while using digital technologies

On one hand, teachers make little use of strategies to foster their students' digital wellbeing since they know digital technologies can positively and negatively affect learners' wellbeing. However, some teachers foster students' awareness of how digital technologies can positively and negatively affect health and wellbeing, e.g., by encouraging them to identify behaviour (of their own or of others) that makes them happy or sad. I foster learners' awareness of the benefits and drawbacks of the openness of the internet.

This is the basic level that corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework adopted in the DigiCompEdu Framework, 2017.

On the other hand, teachers with more skills give practical and experience-based advice on how to protect privacy and data, e.g., using passwords, adjusting the settings of social media and assist them in how to protect their digital identity and manage their digital footprint. Teachers at this (intermediate) level develop strategies to prevent, identify and respond to digital behaviour that negatively affects learners' health and wellbeing (e.g., cyberbullying) and encourage them to create a positive attitude towards digital technologies and being aware of possible risks and limits. The students become confident enough that they can manage possible risks and limits.

This is intermediate level, and it corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately students understand the digital risks and threats in digital environment like identity theft, bullying, fraud, stalking, phishing and how to react them appropriately. Teachers adapt their strategies to foster students' digital wellbeing. And, some teachers innovate approaches to foster



students' ability to use digital technologies for their own wellbeing and discuss and re-design it due to their needs.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.

In a nutshell, to improve the level of competence in using responsible use competence and reach a higher level of this specific competence, educators need to:

- To protect digital devices and digital content and understand digital risks and threats in digital environments.
- To be aware of digital safety, internet risks, internet security and safety measures to be taken and understand it.
- To know details on not to leave digital footprints in digital world and how to protect themselves and others from any damage.
- To know and learn much on digital wellbeing.
- To monitor students in digital world especially in collaborative and communicative tasks and give prompt feedback or reaction to any digital threat.

Dimension 3.5: Digital problem solving

Digital problem solving

Students can identify and solve technical problems or transfer technological knowledge creatively to new situations. Student can identify technical problems when operating devices and using digital environments, and to solve them. They can easily adjust and customise digital environments to personal needs. They can identify, evaluate, select, and use digital technologies and possible technological responses to solve a given task or problem and use digital technologies in innovative ways to create knowledge. With such qualifications students can understand where their digital competence needs to be improved or updated and support others in their digital competence development.

On one hand teachers do not consider much, or very little, on how to foster students' digital tools using ability and how to solve any digital problems whenever they faced. Besides teachers encourage students how to solve technical problems using trial and error. They encourage them to transfer their digital competence to new situations.

This is the basic level that corresponds to the levels Newcomer (A1) and Explorer (A2) of the CEFR framework adopted in the DigiCompEdu Framework, 2017.

On the other hand, teachers implement learning activities in which students use digital technologies creatively and develop their technical knowledge and skills on it. Teachers also encourage students to collaborate and learn from each other. Teachers also implement different pedagogic strategies to enable students to apply their digital competence to new situations and encourage them to reflect on the limits of their digital competence and help them identify suitable strategies for further developing it

This is intermediate level, and it corresponds to levels Integrator (B1) and Expert (B2) of the CEFR framework.

Ultimately teachers at this level enable students to seek out different solutions for digital and technological problems, make use of its benefits and gain the skills of critical and creative thinking to solve problems. Teachers also enable students to apply their digital competence in unconventional ways to new situations and creatively come up with new solutions or products.

The advance level corresponds to levels Leader (C1) and Pioneer (C2) of the CEFR framework.



In a nutshell, to improve the level of competence in problem solving competence and reach a higher level of this specific competence, educators need to:

- To adjust and adapt digital technology and tools to personal needs and identify digital problems while using digital tools and to solve them.
- To solve a given task or a problem, teachers should identify, evaluate, select, and use digital technologies and possible technological solutions.
- To create necessary knowledge teachers should use digital tools in an innovative way and they must improve their needed competence and update it.
- To develop their digital competence in order to be up to date.

Skills and competences required in educators in the implementation of Data Analysis, Gamification and AI tools

Specific skills and competences required for the implementation of Data Analysis tools

Educators, as many other professionals, can make use of data analytics to improve the quality of their teaching methods, as well as to facilitate their daily tasks. Investing time and resources in upskilling their data skills can have a positive impact in their work, their teaching pedagogies, and the lives of their learners



Source: Portafolio.co

1. Data Analytics to improve teaching methods

Most educators already have a certain level of skills in data management and analytics, they consider elements such as grades, attendance, or participation as valuable information to track the progress or their students. However, seeing data through a more informed lens gives a new meaning to these words.

A more skilled in data analytics educator can take a lot of insight from these pieces of information, especially if they use the right digital tools, they can use this information to reveal what topics they should go back because they have not been understood, what topics are students more interested on, how to modify their teaching strategy to adapt to learners needs, etc. In addition, there is so much more pieces of information that can be collected to assess, monitor, and analyse students' performance, as well as your own as an educator. To facilitate this process, and since many classes take place online or using e-learning platforms, we can make use of automatic generated data through these platforms, i.e., Moodle, or other learning management systems (LMS). These online educational systems generally hold the data those skilled educators can extract and manipulate to design better educational experiences for learners.

2. Data Analytics to simplify tasks

In using data analytic tools to support teachers tasks they can have the information they required to assess learners progress in a more effective way. Many platforms generate not only data but also statistics and comparisons that can facilitate the process of recording data by the educator. The automation of this part of data analytics will make the process much easier that manually tallying statistics like the numbers of right and wrong answers in a test.

A mixture of pedagogical and technical skills are necessary for educators to implement data analytics in their teaching and benefit from it, such as the ability to know and choose the right digital tool to generate the data you required, the ability to separate the pieces of information that are valuable to



measure an specific indicator, to be able to organize and visualize the information, to assess and draw conclusions from the collected data, and to transform the information obtained in actions such as feedback to learners, modifications in the teaching methodology, and future planning of lessons.

Hereafter, there is a collection of specific competencies necessary for educators that want to introduce data analytics in their practice:

- To choose the digital tools that are necessary to generate and extract the information we required, meaning to use the e-learning platforms, LMS, digital evaluation tools (quizzes, e-portofios, etc) that can provide as with the information we aim to collect to monitor our learners, that can vary depending on the learning objectives of the course and the characteristics or the target group.
- To use the already organize data that is provided by many e-learning platforms and other digital environments. These platforms already offer statistics of learners' progress, of tests or tasks perform, as well as assistance or time spend in a course.
- To be able to distinguish the trivial information for the data that can be useful to you as an educator.
- To be able to organize all the data collected from different means to be easier to be assess and visualize. Many educators use tools such as excel, or the functions already provided by their learning platforms that automatically organize information.
- To draw conclusions from the collected data from learners' progress, meaning to identify students that are struggling, to be able to determine where the subject is not being correctly understood, when questions or tasks have not been adjust to the level of student being too easy or too difficult, etc.
- To plan and to modify your teaching methods in accordance with the conclusion that you have achieve by analysing students' data. It is important to translate all this information into actions, that can be changes in a curriculum, approaching tasks or tests questions in a different way, individually providing specific feedback to students, to mentor students that are struggling for personal or academic reasons, to provide more explanations to some topics or your subject or to try and make the process of learning a topic more interactive or creative.

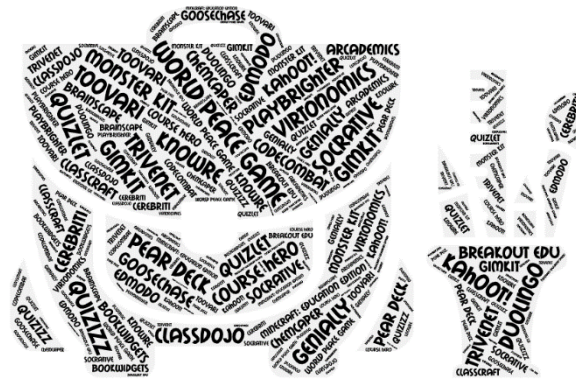
Educators are in the position to help student learn better, more efficiently and deeper. Using data analytics will aid educators in the tasks of identify issues, tracking progress, and many other actions. Digital data analytics tools can also be introduced to make the process of generating, organizing, and assessing data simpler and requiring less effort and skill.

Specific skills and competences required for the implementation of Gamification tools

Today's learners are digital natives and have new profiles. They grew up with digital technologies and have different learning styles, new attitude to the learning process and higher requirements for teaching and learning. Teachers are facing new challenges and must solve important issues related to the adaptation of the learning process towards students' needs, preferences, and requirements. Teachers must use different teaching methods and approaches that allow students to be active participants with strong motivation and engagement to their own learning. Modern pedagogical paradigms and trends in education, reinforced using ICT, create prerequisites for use of new approaches and techniques to implement active learning. Gamification in training is one of these trends.

According to Kapp gamification is "using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems." (Kapp, 2012)

Gamification is the use of game thinking, approaches, and elements in a context different from the games. Using game mechanics improves motivation and learning in formal and informal conditions (GamifyingEducation.org). Various definitions overlap and we can summarize gamification as: Gamification is an integration of game elements and game thinking in activities that are not games.



Implementation of game elements in education is logical since there are some facts that are typical for the games and training. Users' actions in games are aimed at achieving a specific goal (win) in the presence of obstacles. In education there is a learning objective, which must be achieved by performing specific learning activities or interaction with educational content. Tracking the players' progress in games is an important element, because next steps and moves are based on their results. In education tracking the students' progress is essential to achieve the learning objectives. Students' learning path is determined by the achieved levels of knowledge and skills (Glover, 2013). Collaboration in education is a milestone for the effective implementation of active learning. The focus in learning process should be rather towards developing skills for collaboration and teamwork and responsibility for the performance of the group instead of competition between students. Gamification is not directly associated with knowledge and skills. Gamification affects students' behaviour, commitment, and motivation, which can lead to improvement of knowledge and skills (W. Hsin-Yuan Huang, D. Soman, 2013).

Gamification refers to an innovative technology that meets the modern requirements of a digital society. Recently, the elements of gamification are actively introduced into the educational processes of schools, educational organizations of secondary vocational, and higher education. To use gamified digital tools in school subjects successfully teachers need to have some general skills and improve their competences in this area. The required skills and competences are:

- To be interested in the gamification tools that can be adopted to 5E Teaching and Learning model.
- To use game-based mechanics, aesthetics, and game thinking to engage students to the teaching topic, promote their learning and solve any educational problems.
- To distinguish and use motivating and entertaining gamification tools that attracts students with weak proficiency into participating in classroom learning.
- To use collaborative gamification tools to increase the soft skills of the students this has the same importance with their hard skills.
- To choose a gamified LMS that aligns with his/her current teaching method, the topic of the teaching theme or unit, the profile of students and the other educational resources.
- To acquire working knowledge of how gamification tools/platforms operate and its varied features and options.
- To create a variety of assignments that will be appealing and challenging to students with different profiles of students.



- To use gamified video or audio collaborative digital tools not only to improve students' collaborative skills but also give them tasks for co-construction and co-creation of resources and knowledge in order to improve students' creative skills.
- To consider on the level of their students, teaching objective and each course requirements before choosing a gamification tool and planning its implementation, especially when it's the first time they are implementing it.
- To protect sensitive digital content, apply privacy and copyright rules, to understand the use and creation of open licenses and open educational resources and their proper attribution.
- To help students to deal with failure as part of the learning process – in a gamified learning process, failure can be part of learning avoiding students to experience anxiety when facing the chance to fail.
- To apply game elements and game thinking in schools' activities will help to provide flow to students.
- Create challenges tailored to the student's level of knowledge, increasing the difficulty of these challenges as the student acquires new skills.

Gamification is an innovative technology, considered a leading trend in education at all levels. It has significant potential in the formation of digital skills in students and in increasing their motivation to learn. Teachers teaching students at all grades and with different skills need to improve their digital skills and competences to keep up to date. And they have various opportunities to improve their professional development in that area. They can attend at in-service trainings, learn from their colleagues or students, they can make use of many didactic videos on YouTube or at virtual free training activities.

Specific skills and competences required for the implementation of AI tools

Artificial intelligence in its many forms is becoming more and more prevalent in our daily lives, accompanying us in practically all our actions. We constantly have a smart gadget that tracks our activity and provides advice for a better life, from using GPS to locate our way to measuring our heart rate when participating in sports.

To better implement this interaction, it is important to know the skills and competences that are required. How AI will influence the future of mankind and education is a crucial subject that must be answered. Reviewing the effects of AI to reinvent knowledge and education within the guiding principles of inclusion and fairness in access to high-quality learning opportunities is necessary to provide an answer.

We must now endeavour to teach people how to create a notion of the artificial mind considering AI's expanding influence. We must emphasize how the human mind differs from an artificial one. Such skills will call for comprehension of both computational thinking and the workings of AI, as well as human-centred awareness of what each technology can and cannot do.

The importance of education, colleges and universities, instructors, and teaching cannot be overstated in relation to any of these. A report from UNESCO (2021) describes AI skills and it is predominantly focused on academic AI instruction competencies.

There were proposed four categories of AI competencies:

Engineering and design thinking	As well as representation and reasoning, algorithms, and coding, are all examples of computational thinking AI abilities
technology-oriented	Such as knowledge of AI methods, tools, and applications

competences	
Maker-oriented competencies	Designing AI applications and contextual data/algorithm-based problem solving
Human-oriented skills	Understanding the special nature of human intelligence, the ethical and societal implications of AI and data regulation and justice

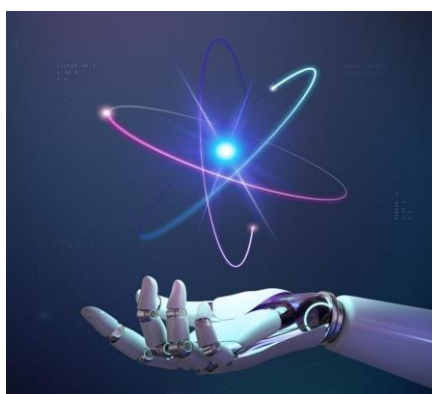
These competences can be developed on three different levels:

- at the national inter-sectoral level, which entails selecting the appropriate AI competencies and creating a budgeted master plan;
- in the educational sector, which entails creating textbooks and assessments;
- by training teachers.

Finally, AI literacy can be developed as part of lifelong learning, which includes informal and non-formal initiatives like coding clubs and hackathons. From a different angle, AI literacy entails a wide range of AI knowledge, such as:

- What AI can and cannot do, as well as the crucial role that humans play in all of AI's technological advancements.
- AI skills, such as creating and using AI;
- AI values, such as when AI is useful and when it should be questioned.

A combination of technological and human-oriented skills is required for AI literacy. The human-oriented competences focus on issues such as data justice and regulation, the history, present, and potential futures of AI, the uniqueness of people, the ethics of AI, and its societal implications. The sophisticated AI knowledge and abilities required to design, manipulate, implement, and interpret AI, on the other hand, are technology-oriented competences, which focus on AI methodologies, technologies, and applications.



Source: Pixabay

In a nutshell, because AI is being utilized more frequently and influences our everyday decision-making throughout our lives, it is important for us to grasp what we need to accomplish it. From one perspective, AI competencies include AI knowledge, what AI can do, and what it cannot do; skills, creating and using AI; and values, when AI is useful and when it should be questioned. From another perspective, AI competencies include human-oriented competencies, computational thinking AI competencies, technology-oriented competencies, and maker-oriented competencies.



Conclusions

Distance education, virtual classes and various web tools have been used efficiently by teachers especially since 2000s. With the sudden outbreak of Covid-19, face-to-face education has been disrupted in many countries as well as it is in the partner countries, Türkiye, Romania and Spain. During the Covid-19 pandemic period, being not able to organize or attend at face-to-face education has been challenging for teachers and students. Information technologies have been serving people for a long time, but Education Systems have not integrated the benefits of digitalized education into the system. And the pandemic has exposed this situation. It is necessary to benefit from the advantages and opportunities of Information Technologies, web tools in distance education, virtual education without the need for pandemics and natural disasters.

Even some teachers, parents or school staff faced difficulties in using virtual meeting tools and web tools in their courses; they get used to them easily, in a short time and learned how to deal with them in the digital world.

According to the national reports prepared by project partners from Türkiye, Spain and Romania we came to a conclusion that both teachers and students have been easily adapted to digital and distance teaching and using web tools in their courses. Teachers and students are active users of web tools in education in the field of Gamification, Data Analysis and AI. Teachers plan their lesson plans interactively and students engage in the courses via different types of tools. In interactive courses students learn from each other their collaborative, creative and communication skills improve.

Using Gamification tools, AI and data analysis tools are also used to improve second language learning. Students use different apps. VET teachers and VET students with improved language and digital skills are what education, business and industrial sector really need. From the national reports of the partner countries we assumed that VET teachers and students in project partner countries are almost on the right track what we objected in this project.

In order to keep up-to-date in digital education age teachers and trainers need to develop their teaching and training methods and learn innovative technics and tools. The need for digital education technologies while training will promote innovation in education. This based-use of technology or digital learning is expected not to be a burden for trainers and students, but on the other hand it tries to aid the learning and teaching process to be more effective. The use of instructional technology can improve and optimise students' knowledge and substantially motivate them to continue their learning and stimulate their creativity and passion. Technology in education can boost variety and increase the diversity of learning environments and opportunities and enhance the quality of the learning experience by making class content more varied and accessible to almost each individual learner. Thus, ensuring more participation and engagement among learners. The purpose of the guidelines for VET teachers and trainers is to research digital teaching platforms in accordance with the 5E instructional model. In that guideline we seek to answer the question: *How can a trainer become a digital one?* The teams of participating countries tried to present some solutions in this guideline based on the principle of the 5E instructional model:

The competence map allows to define curriculum content in terms of interrelated competencies rather than in terms of fragmented or disassociated knowledge, skills, and attitudes. Our work on this topic constitutes a map of competencies requires in any educator to become digital facilitators and introduce digital skills, platforms, processes, and tools in their teaching to enhance the learning experience of students. It is aimed to help educators understand and asses the digital skills they required, identify their needs and gaps, and work towards improving their competencies.

About the partner organisations



In 1999, Femxa Formación S.L.U started its business trajectory as a training company, setting as its main objective to provide innovative training solutions to growing market needs and to anticipate future training needs arising in society. Since then, it developed consulting work specialising in Value Added training solutions, whose focus is on the development of projects of tailored training, aimed to

solve the specific needs of customers more efficiently, which has allowed us to reach a landmark in the field of training. Our reason for being is to build training solutions that provide job opportunities for people and improve the competitiveness of organisations. In the last 20 years, we have trained more than 64.000 unemployed, 40.000 people aged over 45, 15.800 unemployed young people under 30.



TEAM4Excellence (T4E) is a Romanian association aiming to improve the quality of life through education, research, and consulting activities. To address societal challenges, T4E provide learning opportunities and career advice for social inclusion, development, and employability of people, and equip trainers with key competences and skills to foster personal as well as professional development.

Within 30+ EU funded projects, the association

produces and transfers innovation, experience and know-how through cooperation with domestic and international partners. By hosting events, training courses and conferences, T4E strengthens collaboration between people, supports organisations and bridges gaps between generations. The wide expertise in management enables T4E staff to provide consultancy to large companies and SMEs using EFQM Model and Business Model Canvas.



Osmaniye Provincial Directorate of National Education is a regional governmental organisation. Osmaniye covers an area of 3,767 km² and its population is 538.759 inhabitants. Osmaniye province is divided into 7 districts. The organisation takes care of the planning and coordination of all kinds of educational and training activities from preschool to the end of secondary school, vocational high schools, technical schools, adult education, and

other institutions & centres in its region.

Osmaniye MEM organised many courses since 2019 for teachers to renew themselves and over 5000 teachers benefited from these courses. The project experts in the Research and Development office in our Institution have carried out the training of teachers, local or regional authorities and NGOs on preparing and managing EU projects. With these training activities more than 600 students, teachers and managers actively took part in EU projects.



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