



iv4j



GUIDE - WEB 2.0 TOOLS FOR VET



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GUIDE Web 2.0 tools for VET

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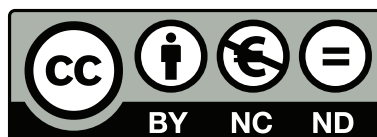
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Introduction

The crucial goal of the IV4J project is to exemplify and demonstrate that and how VET (Vocational Education and Training) can benefit from the contemporary Web 2.0 methods and tools. In order to convince VET teachers and its decision- and policy makers, this IV4J project goes two steps further than just signalling that both the effectiveness and the efficiency of Web 2.0 features will increase. More important is to clarify that the essence of the learning and teaching process will evolve further in the direction of ubiquitous, continuous and life-long learning.

In order to make this mission successful, we as IV4J team have decided to carefully articulate how the Web 2.0 extensions do not necessarily disrupt the traditional culture in expertise transfer from the trainer to the apprentice; Even if we take the more drastic extrapolations of cognitive- and social constructivism, it is still possible to assimilate the more active ways of learning into the trainer-orchestrated class or workshop.

Secondly, as you can see in the examples of this Intellectual Output 4, it is not just the availability of Web 2.0 facilities that urge VET to evolve further than the decades before; It is the professional context (industry and its new economic branches) that pull VET to accept a double focus: First of all the focus of making apprentices sensitive and competent for the needs of jobs at that very moment. Secondly it is the new reality that even in traditional industries like car-assembly, agriculture, food and human service, the employee's innovative competencies, courage and mindset are key in order to let an enterprise survive. In other words: We as IV4J project team face the task to make Web 2.0 tools and methods explicit and didactic. But at the same time we even face the task to extrapolate the best/good practices of ICT-equipped VET into the situation where next-level workers become co-designers and co-problem solvers for the enterprise that will just survive by continuous optimization and innovation. The examples in this I.O.-4 will convince you that the available Web 2.0 features are not just an emulation of the traditional teach-train-test sequence. The new ambition is to progressively coach novice employees into the attitude and self-confidence that future jobs will only emerge when each of your colleagues wants to develop him-/herself throughout one's career. In case of VET, the term "learning" for this lifelong development is an understatement; Workers will need to be creative contributors who want to even improve the task demand that they were told to; Working without showing entrepreneurship will not sustain the next decades.

We wish you courage and inspiration in distilling this chapter's final message and impact.

Piet Kommers

Chapter 1. **WEB 2.0**
FOR VET

1.1 Research all over Europe

Topic of the research: WEB 2.0 FOR VET

Area of research: European countries

Level: all educational level with the focus on vocational education

Reason:

Innovation in the labour market is reshaping VET. This requires VET itself to become dynamic and innovative.

European Commission since 2009 has detected, in the strategic framework for European cooperation in education and training (known as 'ET 2020'¹), four strategic objectives. The new priority areas for European cooperation in education and training were revised on November 2015² - it includes: **Open and innovative education and training, including by fully embracing the digital era.**

In Vocational Education and Training sector of Erasmus+ programme it is requested, as priority of the projects funded, the focus on:

*"Introducing systematic approaches to, and opportunities for, the initial and continuous professional development of VET teachers, trainers and mentors in both school and work-based settings, with a focus on developing effective open and innovative education through the use of ICT."*³

All the national Governments and its Ministers of Education across Europe are trying since few years to innovate the educational system, collecting a differential kind of results and implementation. In effect, in most of the European countries, the policies on digital and online learning are designed and implemented at national level.

The European Commission published an interesting study named: **"Education & training 2020 - Survey on policies and practices of digital and online learning in Europe: digital and online learning"**⁴.

The survey indicates that progress has occurred in the educational sector concerning the integration of digital and online technologies to improve teaching and learning processes as well as learning outcomes. It emerges that investments in infrastructure continue to be one of the top of priorities for government involvement in digital and online learning.

1 Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020') - details available at http://ec.europa.eu/education/policy/strategic-framework_en

2 2015 Joint Report of the Council and the Commission on the implementation of the Strategic framework for European cooperation in education and training (ET 2020) New priorities for European cooperation in education and training - Council conclusions (23 November 2015) ref. <http://data.consilium.europa.eu/doc/document/ST-14440-2015-INIT/en/pdf>

3 More info in Erasmus+ Programme Guide- English version: https://ec.europa.eu/programmes/erasmus-plus/sites/erasmusplus/files/files/resources/erasmus-plus-programme-guide_en.pdf

4 Available for download at <http://bookshop.europa.eu/en/education-training-2020-pbNC0216722/>

7 project partners have conducted a small research, mostly in their countries, about the situation of involvement of web2.0 tools in the system of Vocational education and training.

Results show us the following:

Germany

A joint initiative with the Bundesministerium für Bildung und Forschung (BMBF) [Federal Ministry of Education and Research] will look at the following questions in further selected branches and occupations. What remains important, and which competences need to be expanded for tomorrow's world?

The increasing digitalization of the world of work places great demands on the qualifications provided for today's skilled workers. Together with stakeholders from business, research and VET practice the Federal Institute for Vocational Education and Training (BIBB) examines the specific consequences of this for vocational education and training. The new issue of the BIBB specialist journal "Vocational Training in Research and Practice – BWP" documents the initial results and findings.

The use of Web 2.0 applications in the German vocational education and training system has to be regarded to the context of the digitization. A general overview of the current status as well as the strategic orientation cannot be given in an all-encompassing way.

In Germany there is a differentiated picture concerning the use of digital media, such as web 2.0 applications. Reasons for this heterogeneity include:

- The differentiated school system in Germany
- Various possibilities of subsequent vocational training
- The "dual system", i.e. simultaneous learning in vocational schools and in companies

However, German vocational schools have always been demanded for an in-creasing use of digital media in the classrooms. But shouldn't that have been taking place for years in such a progressive country as Germany?

Only to a small extent, because vocational schools in Germany still don't use the entire possibilities of digitization. This is the conclusion of a study by the Bertelsmann Foundation.¹ Only every third vocational school has a good WIFI supply. According to the study, 40 percent of the schools have no WIFI at all. In addition to the poor infrastructure, the study also shows that there is a lack of support for teachers in dealing with new techniques. 53 per cent of the surveyed teachers and 43 per cent of trainers in companies complained that they lacked guidance on how to offer digital learning aids. The majority of the two groups (60% each) also said that there was not enough time to deal with the new learning methods.

Italy

Using the results of a research conducted by Angela De Piano of the University of Ferrara, which analyses the use of web 2.0 tools by teachers, we can assert that teachers use only the smallest potential of the new web.

In order to enhance the use of these new technologies in educational programs, the Ministry of Education, University and Research has issued a program document called the National School Digital School. It is a fundamental pillar of La Buona Scuola (Law 107/2015), an operational vision that reflects the Government's position in relation to the most important challenges of innovation in the public system: the core of this vision is the innovation of the school system and The opportunities for digital education.

This Plan is not just a simple deployment of technology: no educational passage can take the form of an intensive teaching approach and technology cannot be distracted by this fundamental "human relationship". The OECD reminded him recently. This Plan responds to the call for building a vision of Education in the Digital Age, through a process that, for school, is related to the challenges that society faces in interpreting and supporting learning throughout the Life-long life and in all contexts of life, formal and non-formal (life-wide).

Despite the fact that the overall picture of the Italian school needs special manoeuvres that encourage the development of a methodology of teaching that goes hand in hand with the times, there are no examples of excellence that have been pursuing such policies for some years now.

Ireland

Ireland has a defined policy on Further Education and Training (FET) and the use of technology in FET. The first 'Strategy for technology-enhanced learning in Further Education and Training 2016-2019'⁵ sets out an initial framework for the use of Web 2.0 applications to enhance vocational education and training. This strategy fits within the broader national 'Further Education and Training Strategy, 2014-2019'⁶ and the overarching 'Irish National Skills Strategy 2025'⁷.

According to the strategy for technology-enhanced learning, 'technology is increasingly part of how we live and thrive in our day-to-day lives. The 'internet of things' has become a reality, where everyday tools, services and other objects are designed and connected digitally, and people need digital competence in order to access and benefit from these innovations. In modern education and training, it is essential that all learners are equipped to understand and exploit the full advantages of technology in their work, at home and within their communities...There has been an explosion in the availability of IT software and systems; ways of developing, storing and retrieving learning resources; infrastructural supports; and use of the internet to enhance the learning environment, regardless of where teachers and learners are located (ETBI, SOLAS p7). This clear statement of recognition of the increasing importance of Web 2.0 tools in FET opens up the opportunity for the increased use of technology-enhanced tools in the Irish education system.

The Strategy is based upon 3 themes; building on existing capacity and good practice, expand access and, continuous improvement and innovation. (ETBI, SOLAS pp10-11). However there must be recognition of the challenges facing the education system in exploiting Web 2.0 tools. The Strategy identified four interconnected areas for development to address these challenges as:

1. 'programme design – building innovative approaches such as the flipped classroom; 'bring your own device'; blended learning; social media; interactive, individualised learning plans; feedback mechanisms and assessments into FET programmes as appropriate.

5 ETBI, SOLAS (2016), 'Strategy for technology-enhanced learning in Further Education and Training 2016-2019' (Solas, Dublin)

6 Solas (2014), 'Further Education and Training Strategy, 2014-2019', (Dept. of Education/Solas, Dublin)

7 DES (2015), 'Irish National Skills Strategy 2025' (Department of Education and Skills, Dublin)

2. learning content – eBooks; video; virtual animations; simulations and eLearning resources supporting the course learning outcomes as appropriate for the subject area or client group across the full spectrum of FET provision.
3. continuous professional development – building expertise and confidence in using technology to teach and to enhance learning for existing staff and as part of initial teacher training.
4. technology infrastructure – broadband and wireless internet and network access; virtual learning environments; collaborative online communities of learning and practice; internal content management systems; course calendaring; learner registration and learner support system software that should be integrated so as to reduce the duplication of effort currently in place. The need to prioritise funding based on metrics for return on investment was also highlighted.

These four elements must be developed in parallel in order to successfully embed technology enhanced learning. This approach is supported by leading practice internationally; for example, the technological pedagogical and content knowledge (TPACK) initiative has emerged as a clear and useful construct for researchers working to understand technology integration in learning and teaching' (ETBI, SOLAS p16).

The Strategy for technology-enhanced learning recognises that Ireland has a long way to go. 'It is probably fair to say that, while not currently a leading country in technology-enhanced learning, Ireland is nevertheless well-positioned to make strong advances over the next three-to-five years. A significant programme of reform and development is underway within the education and training system, with a strong drive to support high quality, twenty-first century teaching and learning' (ETBI, SOLAS p21).

Finland

The 21st Century skills of the teaching staff, particularly regarding current ICT competencies, are not on adequate level in general in Finland, when they are compared to the needs of the society, the working life, and to the competencies and ICT use of the students.

This issue has been raised both on grassroot level and on national educational administration. For the first, there is not enough resources allocated to teachers to upskill themselves during their working hours. For the second, many of the ICT skills have been obtained on free time and in informal learning contexts.

In 2011 the Ministry of Education and Culture set an open work group to update the framework for the digital competence requirements for the teaching staff, keeping in mind that the society and the practical needs are very heterogeneous.

As the outcome of this work the MoEC published an open, CC BY-SA licenced site describing the framework (<http://opefi.wikispaces.com>). There are three levels for the competencies: skills needed for own work/school; skills needed in networked development; expert skills needed in major national or international projects. It is a national adaptation of the UNESCO ICT competency framework for teachers.

The competences are listed as open, sectoral topics, ranging from mastering the legislation and copyright issues to pedagogic, platform, and collaborative competences.

This framework serves as a modular repository and guide for creating practical programmes for further professional training.

Several practical projects and organization digital strategies have applied the general framework. The MoEC and the National Board of Education have funded dozens of projects that are based on the framework and that provide open, networked teacher competence development.

Currently MoEC is promoting and co-developing the use of open badges in making educators' new competences visible. The idea is that the digital badge has all the needed information on competences - or skills, contrary to the usual certificate of "attendance" - and that it is administered by the educators themselves, and that they are easy to share and use whenever and wherever needed.

Most schools, municipalities and other public learning institutions have adopted the dual model of further professional training: the organization provides some upskilling and some resourcing, but teachers and trainers are expected and encouraged to update their competences also informally and via peer mentoring.

The Netherlands

After having defined the recent evolution in learning paradigms and didactic measures, Web2.0 and connectionism⁸ is just instrumental to make this evolutionary step realistic and sustainable. Web technologies allow services to become more flexible, more tractable and diversifiable. For vocational training these qualities have been desired for a long time; learning needs to be delivered, tuned to the learner's needs. Even when web-based courses just emulate the traditional way of sending courses, its added value is remarkable in terms of flexibility, tractability ("learning analytics") and tuning to various student categories in terms of profiling and its differentiation effect. The real value of Web2.0 learning technologies is its transformation effect at the aspects as argued under IO3. The most concise way to characterize Learning2.0 is the full impact and integration of social media interaction modalities. The earlier choice of the six Good Practices in the Dutch VET context can best be analysed for the purpose of paradigmatic change.

The digitalisation of the world of work will also bring about increasing change in learning media and in company teaching and learning processes in initial and continuing vocational education and training.

Conclusions

It is hard to be complete and not to underestimate the impact of connectionism and Web2.0's effects in transforming VET from "expertise transfer" into one of "expertise development". Neither the 'pushing' of web-tools and social media networks, nor the 'pulling' for innovative techniques has been the driving force. Of course they helped, however Web2.0's in all society segments has stimulated to exploit its role in education and VET in particular. The real driving force is the embedding of Web2.0's interactions in learning environments and the way its catalytic effects transpire new learning cultures.

8 http://wiki.p2pfoundation.net/Connectionist_Learning_Theory_-_Siemens

Chapter 2. **WEB 2.0**
FOR VET: Tools
for Teaching
and Learning

2.1 Introduction and Approach

WEB 2.0 develops quickly in its technical virtue but also in its integration in face-to-face meetings and traditional publishing of books and mail correspondence. Ideally, the adoption of WEB 2.0 by VET teachers would preclude the adoption by VET learners. Seen the disruptive nature of WEB 2.0 this is not the case; both teachers and learners develop in parallel. In order to scaffold the adoption of WEB 2.0 by VET teachers the role of VET teacher platforms have been prominent the last four decades. They play an ever more important role both in the communication, collaboration and creativity during the selection, innovation and implementation process of WEB 2.0 in VET. WEB 2.0 brings social presence and –interactions while using the internet. Web applications like apps on the smart phone and tablet PCs allow quick access and assistance in navigation. Social networking and social media offer particular services on top of WEB 2.0; It allows its members to feel as belonging to a community promoting group feeling and comfort to become friends of friends' friends.

In the cases of Vocational Education and Training the WEB 2.0 offers three main potentials:

1. Let VET trainers continuously learn in collaboration with their colleagues worldwide. The WEB 2.0 is especially proficient for VET teachers in order to get awareness, knowledge and skills of new best practices for adopting and using new media for teaching/learning. (See Appendix A).
2. Let VET learners access new professional tools/methods more quickly and more versatile just before and during their job performance. In case of VET courses, it is not clear yet how the optimal balance between „following“ the given course and „exploring“ diverse related knowledge resources world-wide.
3. Both for VET teachers and VET learners, the participation via WEB 2.0 has increased the options to act in collaboration, develop a problem-based learning attitude and invest in creative thinking and problem solving.

The progress in WEB 2.0 for VET rests partly on research, however a large part of best practices arise from ongoing VET evolution based upon positive/negative experiences by VET teachers' craftsmanship. In summary, we can say that WEB 2.0 has affected VET has a catalyst; It has sped up the transformation of VET from course- and tutorial-based into blended learning where working, exploring and learning. Its most dominant effect is that the trainer role has migrated from teacher into one of mentor and coach.

Research reports on the prior trends in WEB 2.0 for VET are mainly the ones that provide inventories and try to characterize the shift in underlying paradigms like collaborative- and problem-based learning. Both trends are adjacent to the paradigm of constructivist learning that articulates that learners „build“ complex knowledge and understanding on prior experience and concepts.

In his article „**Work is Learning and Learning is the Work**“, Harold Jarche proposed the two dimensions: „Structured -> Hierarchical“ and „Goal-Oriented -> Opportunity-Driven“. Its stages are respectively 1. Work Teams, 2. Communities of Practice and 3. Social Networks. The need for diversity expresses „Working out Loudly“ and primarily targets the joint job performance. The pure learning agenda is called **PKMastery** (Personal Knowledge Mastery) and demonstrates how one attempts to take control of one's own professional development. In: „**A holistic approach to teacher professional development in Computing**“ Sue Sentance claims that teachers' professional development should focus the increase in learners' progress and measuring its outcomes.

What are Virtual CPD (Community for Professional Development) Networks? What is its Purpose in Theory and in Practice?

Communities for Professional Development in its ideal stage, sense to its members as communities; Mutual loyalty, sharing a common goal, feeling responsible for the success of all of its members. In its premature stage, CPDs manifest as a virtual network: an organised set of on-line services that enhance the communication and collaboration in a group of people. Virtual networks can enhance and extend existing social networks (the networking of groups), because they make communication over distance and across time cheap, quick and rewarding. They help to sustain communication over time and they can serve to intensify, amplify, multiply and extend interactions, for example, encouraging reciprocal exchanges, storing information and eliciting emotional and personal commitments. Virtual networks have particular relevance and value for professionals engaged in social networks. Not only can virtual platforms enhance interaction as within any social network, but in addition they can enhance professional interaction. For example, they can make it easier for teachers working in different schools or different phases or sectors of education to collaborate. They can support communication and collaboration between diverse actors: employers, trainers, teachers, experts, researchers, policy makers and learners. The term 'community of practice' refers to shared understandings, practices, roles and relationships that characterise a group of workers working with one another on in a common activity or vocation.⁹ A virtual platform can perform as a 'virtual community of practice' which facilitates, communicates and enhances that which is shared by a profession or a sub-group of a profession. Ultimately, a virtual community of practice can increase trust and co-working and, in this way, enable a profession to work more collectively and effectively.

These features of virtual networks enable CPDs to be powerful infrastructures for continuing professional development. They make it easier and more rewarding for professionals to learn from one another, to collaborate and to adapt their professional learning to their own professional and personal development. A virtual network can take the form of a unified and integrated set of e-services, in which case it is known as a virtual platform. It is also possible for a virtual network to consist of overlapping or inter-connected but separate e-services. In most cases, we find that virtual platforms are supplemented by a wider network of other services, social media and e-mail. The term social media is understood to refer to a type of internet-based application which permits users to create user-profiles and to upload and share content.¹⁰ Such social media can serve as the medium for a virtual professional network (e.g. a professional Facebook group) or they can be 'plugged in' to a virtual professional platform in order to enhance its functionality. This guidance is concerned, primarily, to learn from real practice in virtual platforms. The review of platforms described above suggests that, in practice, virtual platforms for teachers can be classified according to its main purpose:

1. Repository platforms serve to store and distribute materials: typically, they are supported by the Ministry, and tend to have a top-down architecture and management
2. Actuality platforms focus more on topicality and innovation. They may be top down or they may also take the form of market place where teachers may quickly find novel practices and earn royalties by creating their own lessons

⁹ Wenger, Etienne (1998). *Communities of Practice: Learning, Meaning, and Identity*. Cambridge: Cambridge University Press
¹⁰ Popular social media are listed at: https://en.wikipedia.org/wiki/Social_media#Most_popular_services

3. Community platforms serve a reasonably well defined group of users with a focus on interactive communication. Usually they have been initiated by a group or association of teachers and they are typically managed in a distributed manner.

Web-based CPDs are the best thinkable entities to empower VET teachers and later VET learners as well. Learning and personal development go hand in hand with the enlarging spectrum of WEB 2.0 facilities and still it allows VET professionals to concentrate on a certain curricular domain and prioritize pragmatic solutions above purely media fascination and digression to global actuality, etc.

In order to keep this Chapter 3 “lean and mean”, we decided to delegate the more detailed ins and outs of handling CPDs to the next appendices:

- Appendix A: Current Networks, Communities and Platforms for VET Teachers’ Support in Europe. Its main conclusion is that the need for WEB 2.0 infrastructures is not unique. At least fifteen European teacher networks have been detected and screened for its rise, sustenance and its survival up to now. In order to understand its underlying social mechanisms and incentives, sixteen specialized networks are mentioned. The same will be necessary for each sector of VET in the further continuation of this IV4J project.

- Appendix B: Tabulated Characteristics of the Five Teacher Support Platforms. Five platforms for VET teachers’ professional development have been selected on the basis of its national impact and reputation. The goal was to provide a compact representation of its functionalities, its momentary mission, its depth of resources and its stage in community development. For this reason, we built a matrix with the characteristics of the five main platforms that we identified. Three recurring drivers from the earlier inventory emerged: Repository-, Actuality- and Community-support. After a careful evaluation, the next five educational CPDs have been selected: **TES**, **ETBI**, **FORAUS**, **SFIVET** and **DSCHOOL**. Conclusions are that members in dedicated repository-oriented platforms tend to use general social media (typically Facebook) to complement the top-down regime with just-in-time and personal sharing. In conclusion: it seems that the three main drivers each grow in impact once they integrate the two other ones. The other trend that can be seen is that social media like LinkedIn start to develop specific Communities for Professional Development as well and may become the fourth driver finally.
- Appendix C: Other detected VET Teacher Support Platforms. This appendix targets the larger constellation of CPDs for VET, not only in Europe, but also in Australia and Canada. Its goal is to let VET organisations choose whether the European “culture” of making VET support subordinate to national authorities is still a lucky one.
- Appendix D: Five Platforms for VET Teachers’ Support; Identification and Recommendations for Potential Pilot Networks. This appendix maps back the selected CPDs unto its basic functionalities like News, E-Learning (lesson- and course formats), OERs (Open Educational Resources) like MOOCs (Massive Open Online Courses), Blogs, Forums, etc. For each of the five EU countries with each of its preferred educational CPD, aspects are discussed like flexibility, managerial comfort, commercial side effects, scale and capacity, return on investment time and efforts, etc. Its main conclusion is that in contrast to VET as part of regular education, VET for SME’s (Small and Medium Enterprises) needs a much more flexible format and mechanics than estimated the decades before; It is hard to discern a core curriculum, and the authenticity of the learners’ processes seems to be more important than in the classical paradigm of transferring expertise from the ancient to the novice.

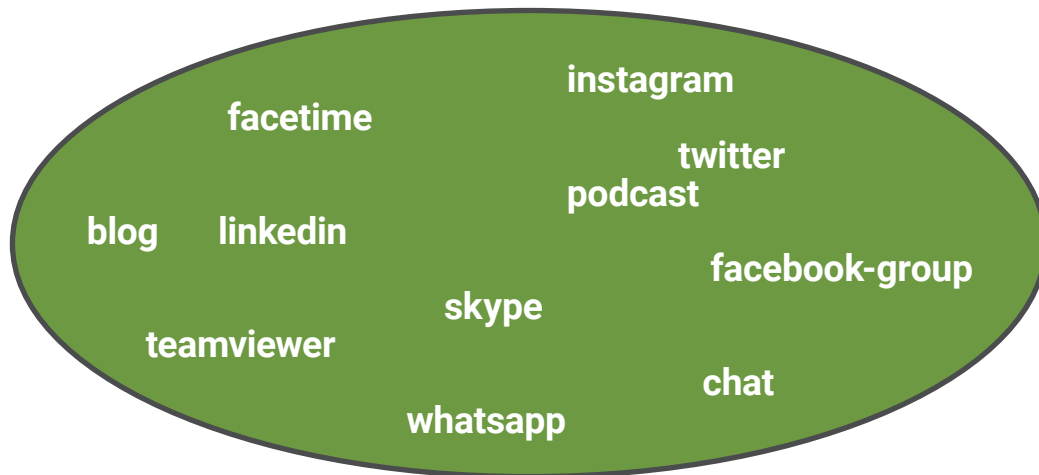
- Appendix E: Platforms for VET Teachers' Professional Learning. In this appendix, we try to provide summative conclusions on what VET teachers need from CPDs: 1. News and updates, 2. A repository with innovated learning material and 3. A community for collaborating with colleagues. The five discussed platforms show a mature degree of the first two ingredients: News and repository.

As overall conclusion of this Chapter 3 we can say that by observing the many attempts to establish CPDs for VET, a lot can be learnt on how to avoid failures, misbalance between fragmentation, consolidation and re-usability. The next step is to let each of the IV4J partners reflect upon the mentioned trade-offs and developmental ambitions that need to be taken in consideration. Flexibility and smart exploitation of available WEB 2.0 network mechanisms seems to be the top priority for each of the VET providers. Though individual VET teachers may improvise and find local WEB 2.0 solutions, it seems worth to find templates for a more common approach.

Chapter 3. **Web**
2.0 Tools for
COMMUNICATION

3.1 Communication tools

websites, podcasts, polls, surveys, blog, email groups e.g. Skype Moodle, Podcast, Twitter, work in team



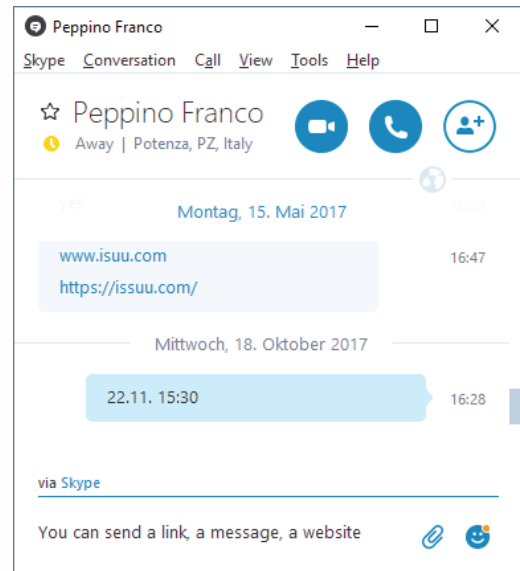
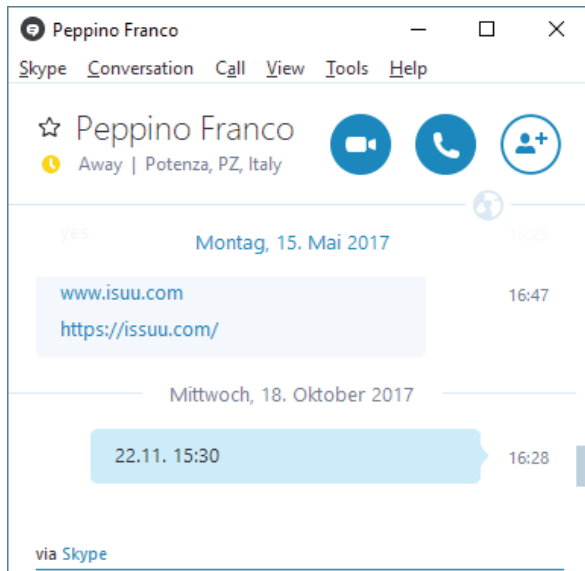
Let's watch on Communication – Tools, if you communicate, you can collaborate, is not clear to define or to classify the apps, programs by purpose, target group or hardware. (for PC, MAC, Tablet, Smartphone).

We setup up focus on the trainer/teacher in VET-process. Very popular are blogs, if teachers using blogs classroom based or schoolyear based, they can share information, task, projects. General aim can be discussion to a teacher generated topic or question. Blogs can inform about following content, to generate interest on future lessons. Other variant to find out, what the students already know. Using Blogs can supply students with feedback from classmates and/or teacher.

Communication is possible using social networks like Twitter to keep parents informed about school activities.

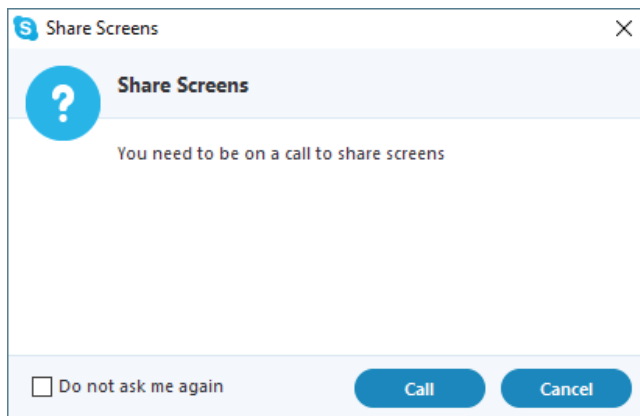
Face-to-face communication using video needs a membership at the promoting website, like OoVoo.com or skype.com. (free to use with account)

For VET-Trainer it is mostly difficult to find time for self-qualification, to test different upcoming websites, apps, tools, platforms. If this time exist and you are watching by Google or other searching engines ... you are in short time overloaded with the results, 10-1000 or more different platforms and tools are on the market. As a pioneer in this field we can name the Programm or app „Skype“ a part of Microsoft, its free for use. A Trainer or a class can visit a classroom in another part of the world, using interactive video.



Simple description: without cost, with running internet connection you can:

- Talk with 1 or more people, using sound or using video. You can see mimic, gesture, objects
- Interchange of files direct from one to the other partner (peer to peer without Email).
- Skype-Meeting for Discussion about topics like this project. Find common understanding, dates, subjects



- Screen sharing, watching in group to the same content, calculation or information TeamViewer and many other applications.

3.2 Photo Sharing

You most likely have the tools to take hundreds of photos daily: digital tools mobile phones, tablet devices, DSLR system cameras, action cameras were estimated to take 1.2 trillion photos in 2017 - more than 1,000 pictures per every person in the world.¹¹

You've most likely saved all the photos to your mobile phone and shared some on Facebook or Instagram. Gradually it will get complicated when you want to find the right ones or to embed your images to a presentation or a video project.

This text gives you ideas why and where to upload your photos for sharing and organizing them. You'll learn the best sites to find free high-quality images online to build upon. The article also sheds light on what to consider when choosing a service or when in doubt about the copyright issues.

The article is an outcome of IV4J project. It has been written specifically for vocational education and its connections to the work places. In many cases students, schools, and employers have joint projects, or students are in their on-the-job learning and need to document that. The examples on the services depict using them for vocational education in the EU.

Organize, protect and share

The first thing to do is organize your photos, be it paper photos or digital images. Paper photos can be scanned even with a mobile phone if you place two lamps to each side in such 45 degree angle that there won't be reflections. Then, there are dozens of reliable photo sharing sites to upload your photos and to organize them into folders and add tags or other useful information for find them later.

Even though the most popular photo sharing sites can be trusted to a great extent, it's better to have at least one offline copy for example on an external hard drive.

Now, when you know what you have got and where, it's easy to share and reuse the photos. If you make them public and if you choose a license giving others the permit to use them too, your photos will make a valuable contribution to open culture. Likewise, you can use photos shared by others.

In addition to using photos as themselves, like sharing them on social media, they are valuable raw material for presentations, school web sites, video projects and much more. Particularly for team work the easiest option is to upload the pictures to an online repository and reach them there.

Think about this when choosing a service

Choose a photo sharing site that has been around for a while and that is recommended by several articles like this one. Usability, stability, and longevity are important. Think about your particular needs like automatic syncing with your phone, storage space, privacy options, etc.

There are three main categories:

¹¹ <https://mylio.com/true-stories/tech-today/how-many-digital-photos-will-be-taken-2017-repost> (12/20/2017)

1. Dedicated photo sharing sites
2. Social media sites
3. Cloud-based software mainly for personal archiving

In order to upload and manage your photos, you need a user account. All the sites discussed here have a free account option for sharing images. With some, that has limits regarding the number of photos or the size of the image. If you are managing a school project, think thoroughly what and whose email account to use for registering so that the content stays accessible even if a student or a teacher leaves the school.

You maintain the ownership of your photos. In their Terms of Service, the sites ask you to accept them to do a variety of things with your content, mainly to be able to copy them between servers, and to show your photos to others. Some, particularly social media services like Facebook and Twitter, are based on sharing and re-tweeting content, and their Terms ask you to give the service provider full rights to use the content any way they like. It may be difficult or even impossible to get your photos deleted from the service. Thus, upload only such content that you feel at ease if they start living a life of their own online.

For example, even though the writer of this article has uploaded his photos to one of the “safest” sites, Flickr.com, the photos appear in other services like Hiveminer.com and Picssr.com.

From the copyright point of view, the dedicated photo sharing sites are better. Still, always check the Terms first. The Terms of Flickr.com make it clear that the photos are yours and it will not use them any way they find suitable.¹² Photobucket says any photo you have uploaded as “private” will stay so but if you mark the content as public, you grant us a worldwide, non-exclusive, royalty-free, non-revocable, right and license to copy, sell, convey, distribute, stream, post, publicly display (e.g. post it elsewhere), reproduce and create derivative works from it (meaning things based on it), whether in print or any kind of electronic version that exists now or is later developed, for any purpose, including a commercial purpose with the right to sublicense such rights to others.¹³

If the copyright owner does not state otherwise, people must always ask for a permission when they want to use a photo for any other than private use. To simplify things with content that is intended to be shared, many of the photo sharing sites use Creative Commons (CC) licensing. It is the most widely accepted system for informing how the content can be re-used. The basic CC license is CC BY (4.0). CC refers to the Creative Commons licensing in general, and the letters after it refer to specific term, in this case pronoun “by”. It means one has to credit the source.

¹² <https://www.flickr.com/services/api/tos/> (12/20/2017)

¹³ <http://photobucket.com/terms> (12/20/2017)

An example on re-using of and referring to a photo uploaded to Wikimedia Commons under Creative Commons license:



Helsinki South Harbour Panorama by Roccodm in [Wikimedia](#) (CC BY-SA)

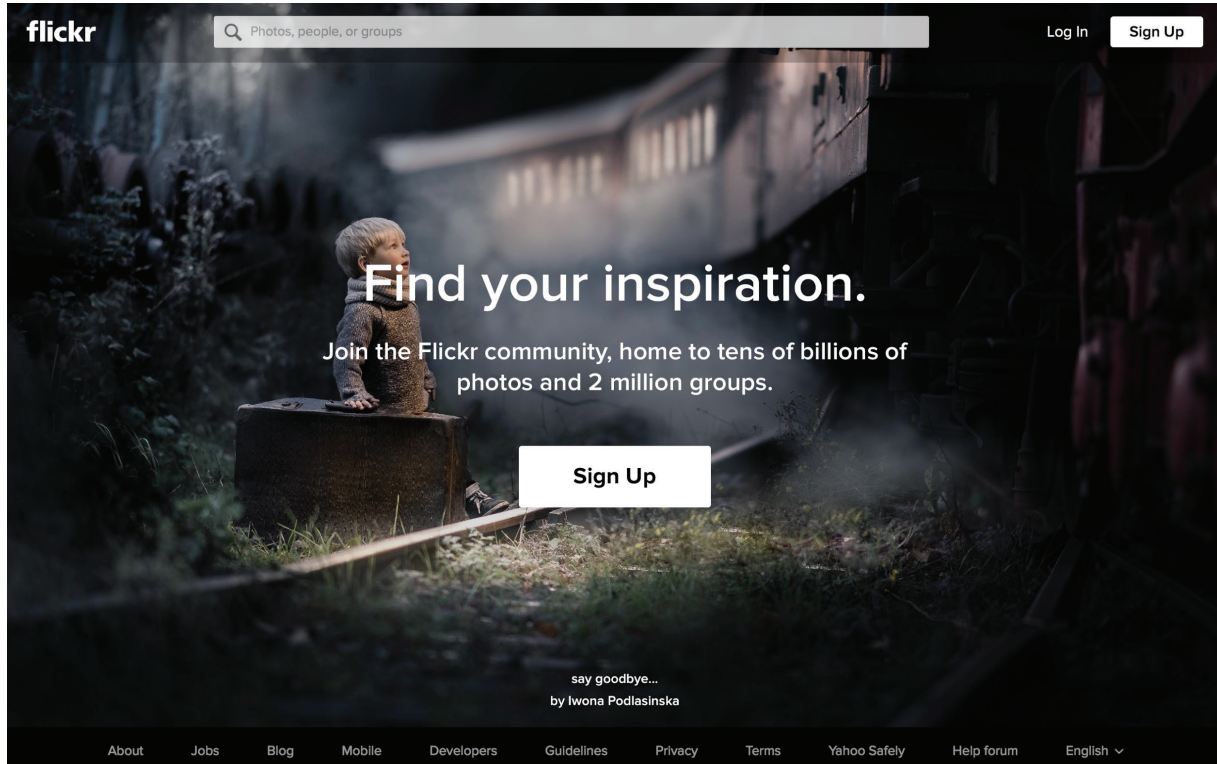
Below you will find short introductions to such key photo sharing services that have a free account option (as of December 2017). The most popular and versatile come first. I have omitted some popular sites you find listed elsewhere, most notably Photobucket due to their current practice of having a lot of advertising on free account pages. For more detailed information on the features, visit [List of image-sharing websites](#) on Wikipedia.

This article doesn't cover cloud repositories like Dropbox, Google Drive, or OneDrive which have their own area particularly for personal and team work, nor Adobe Lightroom CC which is an image organization and editing software with online sharing capabilities.

There are sites for sharing spherical 360 panoramic photos. Read more on these eg. from [How To Share 360 Degree Photos](#) or [Best 360 photo sharing platforms](#).

3.3 Dedicated photo sharing sites

Flickr



Flickr is one of the biggest photo sharing sites. One can upload and share photos, create albums and collections, and take part on the community discussions there. You can provide tag words to make it easier for you and others to find content. Flickr is nowadays owned by Yahoo, and one must create a Yahoo account first. There is a vast **The Commons** collection consisting of tens of thousands of photos and drawings released by the British Library, The Library of Congress and similar. It can be accessed also without an account, just like most of other Flickr content.

Account types: Free / Pro / Pro+ ([read more here](#))

Storage: 1 Tb (limited for all account types)

Content ownership: Flexible privacy settings, supports Creative Commons licensing, public photos can be viewed without an account

Examples: [European Vocational Skills Week](#), [Carrigallen Vocational School, Ireland](#)

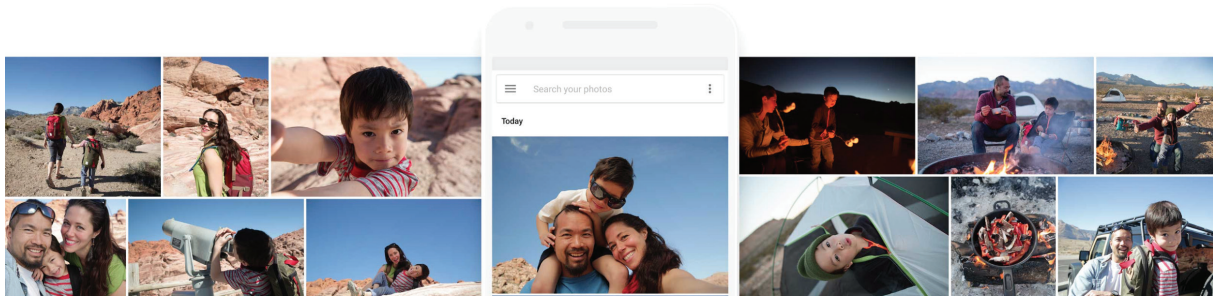
Google Photos



Google Photos

Free storage and automatic organization
for all your memories.

GO TO GOOGLE PHOTOS



Google Photos was originally for backing up mobile photos (Android and iOS) and uploading them to be used in Google services like Blogger. It arranges the photos by location and date. It can also recognize the photo subject or topic with the help of artificial intelligence and eases the search and uses that for auto-grouping accordingly. There are basic editing tools like colour and exposure, as well as some automated features like turning images into mini animations. One major restriction is that currently there is no direct way to get the code for embedding a photo on a web page.

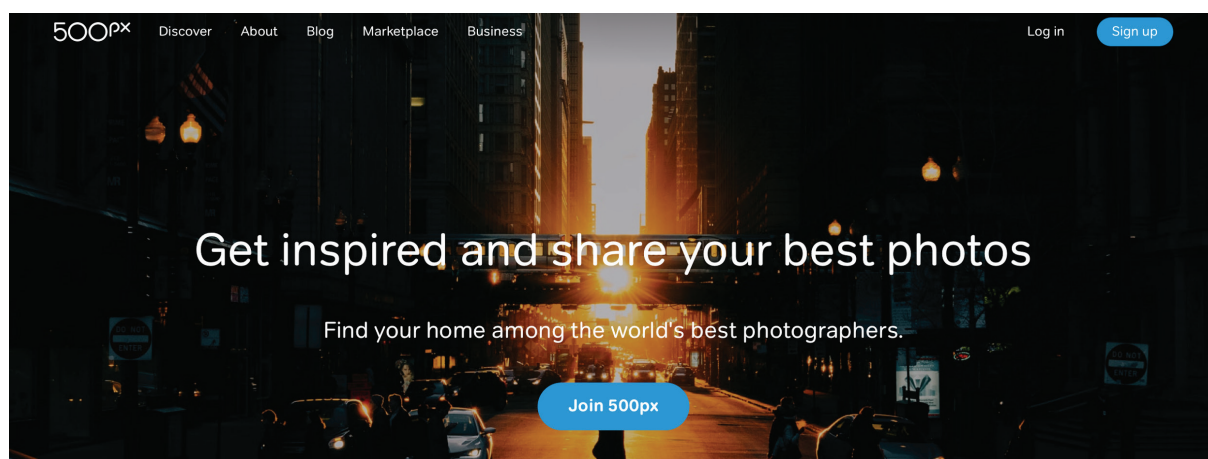
Account types: Free / Paid for extra storage in “Original” mode

Storage: Unlimited if you set the photo size from “Original” to “High quality” (Google compresses large files to be 16 Mb max which works fine if you are not saving RAW files); with “Original” setting it uses your Google Drive space

Content ownership: Flexible privacy settings, no support for Creative Commons licensing, public photos can be viewed without an account. Terms of Service look like you let Google to do anything with your photos, even to use for marketing. If this worries you, read e.g. [this discussion](#).

Examples: Exchange students report on their travels usually in Blogger which is a Google-based service. In most cases they upload their pictures to Google Photos, and share only some on their blog. Examples of such blogs can be found in Omnia’s blogs, e.g. [on this page about exchanges in the Netherlands](#)

500px



500px is more for the serious photographers keen on creating a portfolio and sharing their work. Family snapshots or work-related documentation would be out of place there. It has a marketplace, too. Free account doesn't allow creating a portfolio or to showcase images.

Account types: Free / Paid

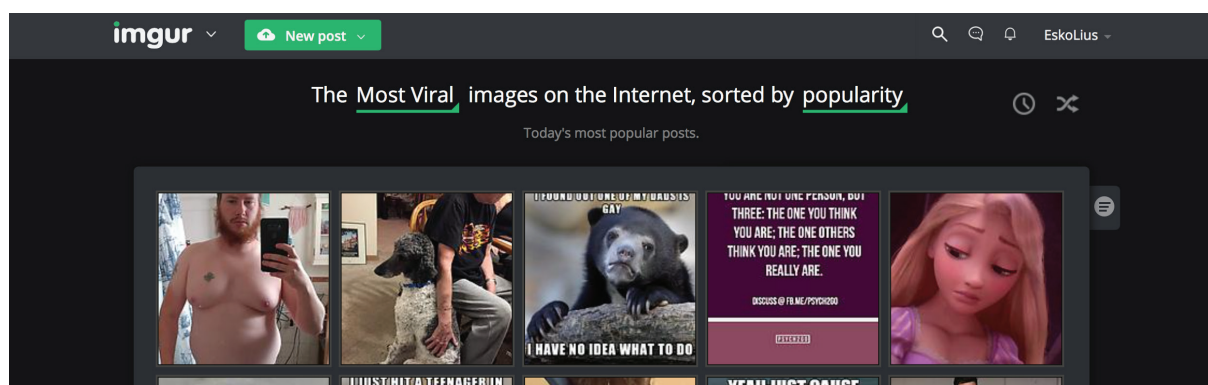
Storage: Free: 20 photo uploads / Paid: unlimited

Content ownership: Private/public, supports Creative Commons licensing, public photos can be viewed without an account

Examples: [Artisan tools for VET brochures](#) etc

Imgur

Imgur is very different from any other service listed here. It is between a photo sharing repository and social media. Uploading photos there is fast, simple and doesn't require an account. There are Meme Generator and GIF creator tools. As a service Imgur is reliable and trusted – even though the user content is more of viral memes and everyday snapshots. One should not trust that photos uploaded to Imgur obey copyright laws. Imgur is mostly used as a linking service. So if you have an odd photo to share or embed on a web site or a discussion forum post, you might want to upload it to Imgur first.



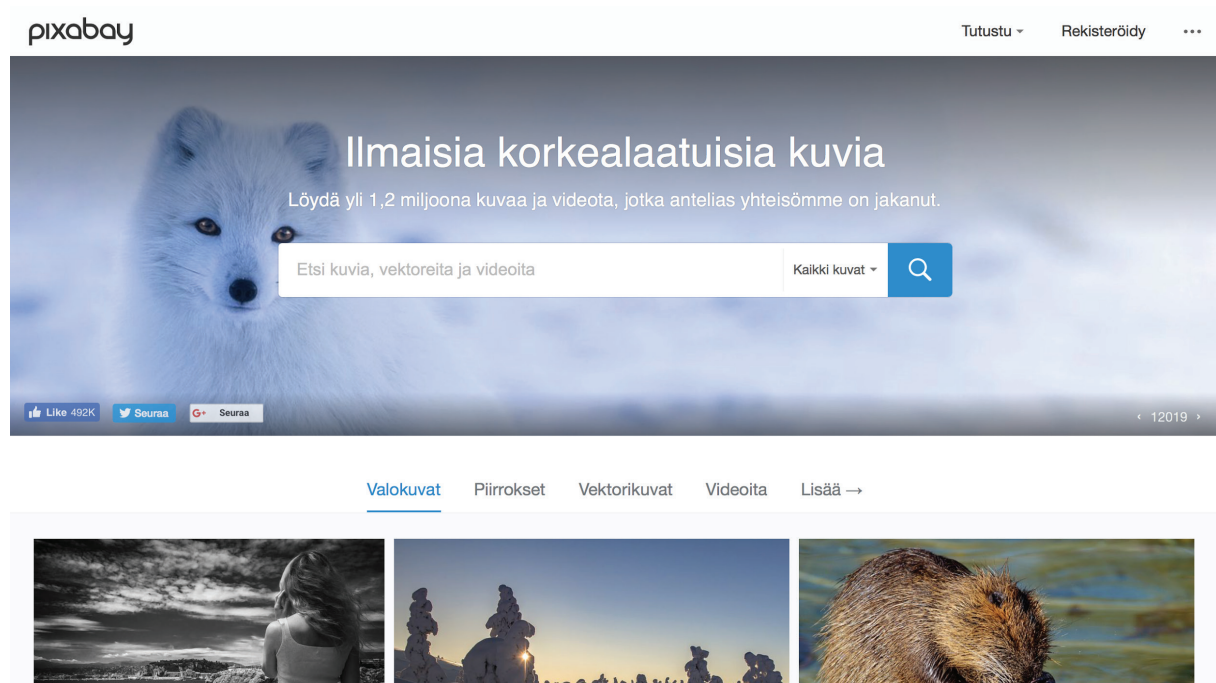
Account types: Free, and for a single upload one doesn't need an account at all

Storage: Unlimited (20 Mb file size limit for photos)

Content ownership: Private/public, no support for Creative Commons licensing, public photos can be viewed without an account

Example: [VET learning in virtual reality](#)

Pixabay



Pixabay is one of the best sites to find open, high-quality visual content. Everything uploaded to Pixabay is shared under the Creative Commons CC0 license, meaning that you can use the photos, illustrations and videos any way you want even without crediting the photographer. There are image quality standards for content, so not all photos will be accepted. Pixabay shows also content from Shutterstock. These are not CC0 licensed and may confuse the user searching for royalty-free photos. One can't embed photos on own web sites directly from Pixabay. Instead, the content must be downloaded first and then attached to the context or uploaded to another service.

See also [Unsplash](#) which is a similar site for high-quality free content.

Account types: Free

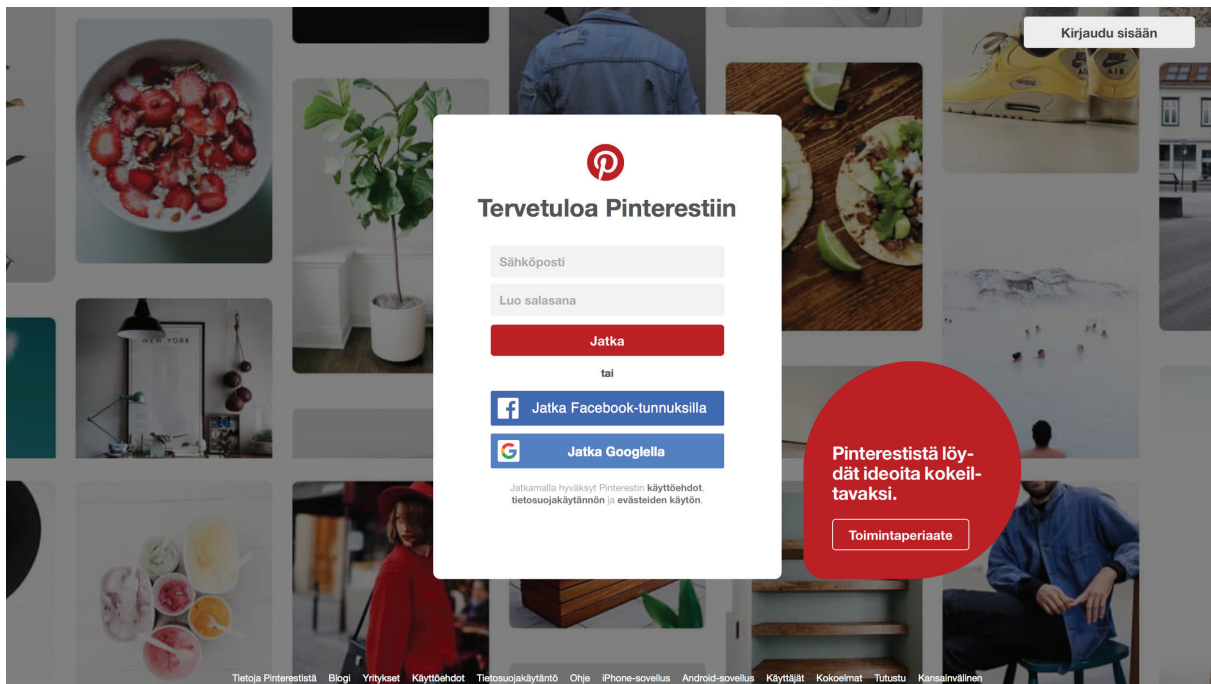
Storage: Unlimited

Content ownership: Private/public, limited support for Creative Commons licensing (CC0), public photos can be viewed without an account

Examples: [Learning photos](#)

3.4 Social media sites

Pinterest



While Facebook and Twitter are more towards general content sharing, **Pinterest** is for sharing and pinning images. Pinterest is one of the biggest image sharing sites, and it is completely free. One needs an account to share and manage content. Mostly photos are added to thematic boards by linking photos that are already online. It means that most of the content you find from Pinterest is actually copyrighted.

Account types: Free

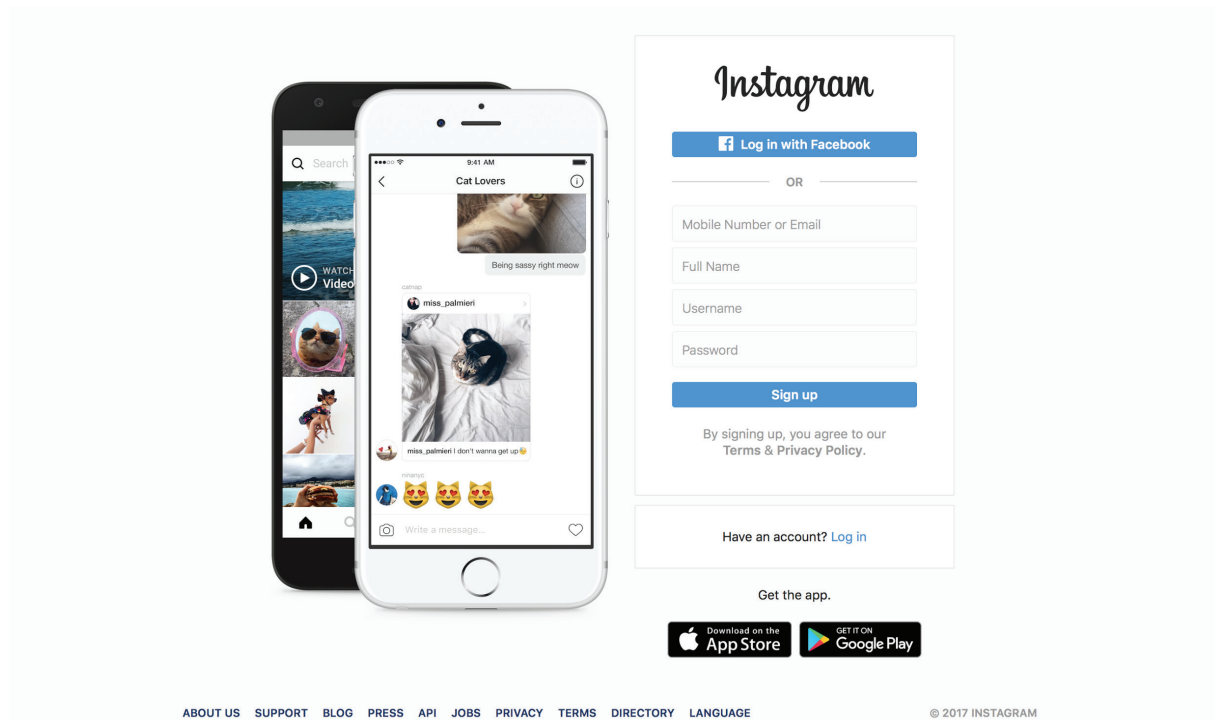
Storage: Unlimited

Content ownership: Private/public, no support for Creative Commons licensing, public photos can be viewed without an account

Examples: [Catering teacher's boards](#), [Automotive learning material board \(Engines\)](#)

Instagram

Instagram is for sharing the photos from your phone via the Android or iOS mobile app. It's great to spread the word on your personal life or a work project. The app has a set of basic photo enhancing



tools. Sharing is strongly based on hashtags.

Account types: Free

Storage: Unlimited

Content ownership: Private/public, no support for Creative Commons licensing, public photos can be viewed without an account

Examples: [Hashtag for Erasmus+](#); [MunOmnia hashtag](#) is for everything related to Omnia, a multisector education provider in Espoo, Finland; [catering student photo feed](#)

Facebook

facebook

Email or Phone Password Log In
Forgot account?

Sign Up

It's free and always will be.

First name Last name

Mobile number or email

New password

Birthday

Dec 21 1992 Why do I need to provide my birthday?

Female Male

By clicking Create Account, you agree to our [Terms](#) and that you have read our [Data Policy](#), including our [Cookie Use](#). You may receive SMS Notifications from Facebook and can opt out at any time.

Create Account

[Create a Page](#) for a celebrity, band or business.

English (US) Suomi Svenska Eesti Русский Français (France) Deutsch Türkçe العربية Español Português (Brasil) +

Sign Up Log In Messenger Facebook Lite Mobile Find Friends People Pages Places Games Locations
Celebrities Marketplace Groups Recipes Sports Look Moments Instagram About Create Ad Create Page
Developers Careers Privacy Cookies Ad Choices Terms Help

Facebook is a bit off the topic here but as it is so central in sharing content, it can't be left out. You can share anything from any device, either to your own personal profile or to a group or to a Facebook page. One can't share big original size photos as Facebook re-sizes everything down to fit the page (max 2048 pixels wide).

Account types: Free

Storage: Unlimited

Content ownership: Private/public, no support for Creative Commons licensing, public photos can be viewed without an account

Examples: [Catering Guild Facebook page](#)

3.5 Messenger Tools

Nowadays messenger tools are used very often and became massively popular for daily communication. These messaging apps put instant messaging, text messaging, private forums, video calls, and sometimes even screen-sharing, into one specialized collaboration app. The result is a single place where you can chat with coworkers both in real time and asynchronously. The collaboration can be one-on-one, by invite only, or among whoever in the organization decides to join.¹⁴

Skype

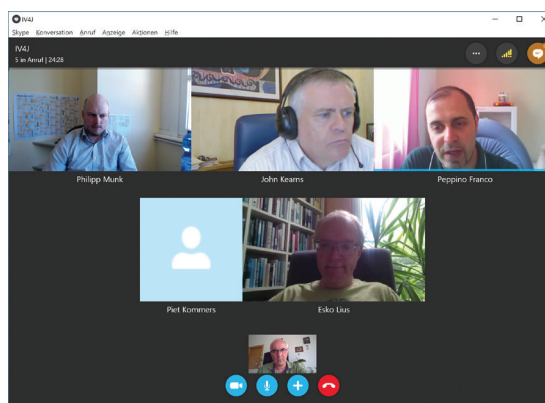
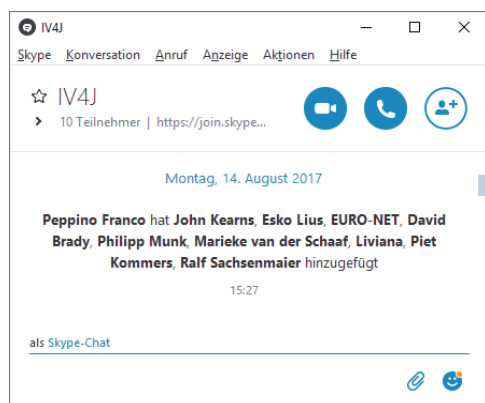
As a pioneer in this field, we can name the Program or app „Skype“ a part of Microsoft, its free for use. A Trainer or a class can visit a classroom in another part of the world, using interactive video.

What it is

Skype is primary a face-to-face communication tool between 2 or more partners to talk to share photos, messages, emoticons and stickers in real time. (costless) and you can call phones around the world from mobile or PC to each mobile or landline number for small fee. (low cost)

Why is it useful for VET

You can talk with 1 or more people, using sound or using video. You can see mimic, gesture, objects... Students who are home from different reason can participate from fare. Colleagues you can invite in a meeting or create Counselling group call. You can demonstrate on your screen and share it to all skype-partner



How to

You need a PC, MAC, Tablet or Mobile and Download the Software from Website: <https://www.skype.com/en/get-skype/> Install it and make account to skype

Simple description:

- Without cost, with running internet connection you can:

¹⁴ <https://www.pcmag.com/roundup/355674/the-best-team-messaging-apps>

Interchange files direct from one to the other partner (peer to peer without Email).

- Skype-Meeting for Discussion about topics like this project. Find common understanding, dates, subjects
- Screen sharing, watching in groups to the same content, presentation, calculation or information.

Links

- <https://support.skype.com/en/faq/FA6/what-is-skype>
- <https://www.lifewire.com/what-is-skype-3426903>
- <https://www.skype.com/en/>

Slack

What it is

Slack is a cloud-based set of proprietary team collaboration tools and services Slack brings all your communication together - a simple place for messaging, tools and files. Slack is an instant messaging and collaboration system that has many functionalities.¹⁵

- Channels - help you focus by enabling you to separate messages, discussions and notifications by purpose, department or topic
- Private Channels - for sensitive information, where you can invite a few team members
- Direct Messages - When you need to send a message to one person instead of a group, Slack provides traditional instant messaging functionality for you to do so
- Share your files - Sharing documents is one of the basics of collaboration. Slack enables you to share all types of files, even those stored outside of the solution itself
- Search - Slacks robust search functionality enables you to find key information quickly, even if it's inside of a document you've shared
- Notifications - Slack enables you to fine-tune your notifications (by channel, keywords and more) so you can focus on your highest priorities
- Preferences - Slack provides robust preference features at both the company and individual level. This enables your employees to make Slack their own while you control the overall use of the solution
- Platforms - No matter where you go, Slack can come with you with their mobile apps for iOS, Android and Windows Phone (beta).
- Price - free to use for small business, but they offer also a reasonable per-user pricing for better solution.
- Integration - is what takes Slack from a normal online instant messaging and collaboration system to a solution that enables you to centralize all your notifications, from sales to tech support, social media and more, into one searchable place where your team can discuss and take action on each

15 <https://smallbiztrends.com/2015/12/slack-use-team.html>

Why is it useful for VET

Besides a simple place for messaging, Slack has very useful functionalities that can enhance a better collaborative work among trainers and students. Some of the functionalities are:¹⁶

- to organize and share information
- fostering discussions and sharing information with students
- to manage large-scale projects
- messaging platform as a tool for curating stories

Links

- <https://get.slack.help/hc/en-us/articles/115004071768-What-is-Slack->
- <https://www.philsimon.com/blog/education/use-slack-inside-classroom/>
- <https://www.wikihow.com/Use-Slack>

WhatsApp

What it is

WhatsApp Messenger is a freeware and cross-platform messaging and Voice over IP (VoIP) service owned by Facebook. The application allows the sending of text messages and voice calls, as well as video calls, images and other media, documents, and user location. The application runs from a mobile device though it is also accessible from desktop computers; the service requires consumer users to provide a standard cellular mobile number.¹⁷

Why is it useful for VET

The underlying purpose of WhatsApp is to facilitate communication, and at its most basic level, education is nothing but communication. Some reasons for using WhatsApp for VET are:¹⁸

- It allows free unlimited messaging
- It can be used directly over the Internet via WhatsApp Web.
- Unlike some messaging solutions, WhatsApp can be used to send videos, audio messages, and pictures.
- WhatsApp is a cross platform solution.
- WhatsApp can be used to reach students via the technology they are most familiar with: their phones
- Facilitate real-time communication
- Use the Group Chats feature to create learning and study groups
- Create audio lessons that can be sent directly to students
- Stay in contact with students outside the classroom
- Send out problems or assignments to students even when they are not in class

Links

- <https://files.eric.ed.gov/fulltext/EJ1163229.pdf>
- <https://www.slideshare.net/FatmaGhailan/whatsapp-as-a-learning-tool>

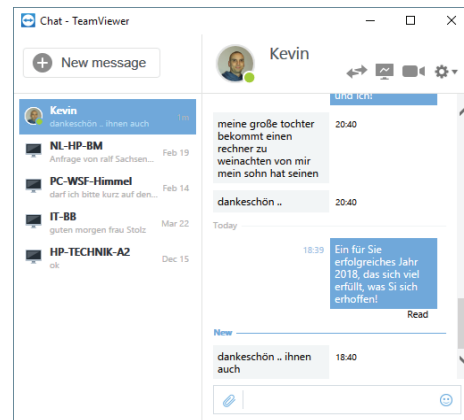
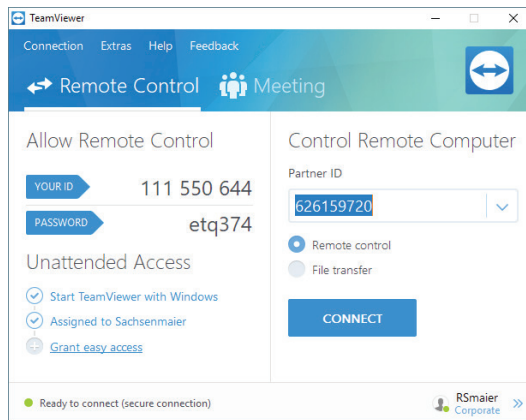
¹⁶ <http://mediashift.org/2016/08/slack/>

¹⁷ <https://en.wikipedia.org/wiki/WhatsApp>

¹⁸ <https://www.quora.com/How-can-I-use-whatsapp-for-educational-purpose>

3.6 Screen sharing tools

TeamViewer



What it is

Teamviewer is primary for remote access (Control) from on to the other PC. IT-Service, Hotlines Printer-Support are using it since long time. Second function Meeting voice and video based.

Why is useful for VET

Very often students are not sure how to proceed at the Device/PC/Tablet installing new software, access to learning platforms or other learning resources and you can help direct on target PC from distance, you can help using chat, audio instruction, video support if necessary. TeamViewer is running with AND without installation... fast success! So we can decrease doubts or barriers using new tools, software, learning environment, learning platforms.

How to

For setup of TeamViewer download from website [teamviewer.com](https://www.teamviewer.com) and follow instruction. [Teamviewer_setup_en](#) After setup you have YOUR ID and can allow another person Remote Control on your Device/PC/Tablet, transmitting ID and temporary password to helping person somewhere in the world (on a PC with internet).

For using in Meeting you can chose at main menu Meeting Button. Short introduction you can try and see here:

- [Teamviewer_intro_en](#),
- [Teamviewer_training](#)

Links

- TeamViewer <https://www.teamviewer.com>
- If you are in a hurry for Join into Meeting, you can download the version <https://download.teamviewer.com/download/TeamViewerQJ.exe>
- If you are in a hurry for support, you can download the version Quick support <https://download.teamviewer.com/download/TeamViewerQS.exe>

3.7 Video sharing tools

Time spent in consuming digital video content has doubled in five years. Mobile video is being used four times as much as in 2012.¹⁹ Almost half of all young people in the EU-28 uploaded self-created content, such as photos, videos or text to the internet already in 2014.²⁰

Video is big, no doubt. It's vast too: from edited video content to webinars and gameplay streaming, from podcasts to animations and news reports. It deals with moving image, still images, and audio.

As a teacher/trainer, you can use video as learning material: instructions, tutorials, or recording and analysing skills learning process. It is suitable both for before the class watching (flipped classroom), student production, and for further learning material.

As a learner, a video may be easier for you to comprehend than a text-based document – particularly in vocational education and training where there are many practical, physical skills to be learned. As a student you may find video material more interesting than traditional learning content. You can also produce your own video content, e.g. to enhance your on-the-job learning blog.

In this article we will focus on the educational use of video in vocational education and training: how to produce and share videos, and how to use content by others.

The article is an outcome of **IV4J project**. It has been written specifically for vocational education and its connections to the work places. In many cases students, schools, and employers have joint projects, or students are having their on-the-job learning period and need to document that. The examples depict using them for vocational education in the EU.



This Will Revolutionize Education by Veritasium on Youtube

¹⁹ <https://www.statista.com/statistics/420799/daily-digital-video-content-consumption-usa-device/>

²⁰ http://ec.europa.eu/eurostat/statistics-explained/index.php?title=Being_young_in_Europe_today_-_digital_world&ol-did=351791

Creating your own content

Usually creating a video requires good planning before taking any action: what is your goal or message, for whom and in what context it will be used, how it will be shot and edited, and finally where it will reside and how to be found.

See for example [Planning A Video Production](#) by Connie Malamed or /insert your local language version/ the Finnish [Digitaaliset tarinat oppimisessa](#) by Esko Lius.

In schools and at workplaces there may be restrictions on what and where to shoot videos. You will also need to consider copyright issues. We recommend that your creative team makes an agreement on sharing the video under a Creative Commons license. That helps others to use the video for educational purposes. Not every country has a "fair use" right in their legislation to let teachers show your video to students.

The easiest way of creating videos is to shoot it with a phone or a tablet device, and edit it straight on the device (use [iMovie](#) for iOS and see Android alternatives [here](#). Then you upload the video to your YouTube channel with proper privacy settings and you're done. If the shooting environment is noisy or if you haven't got separate mics, check your video before sharing and retake the audio if necessary.

If you need more editing options, it's usually best to transfer the files to a computer. For that you might upload the clips to a cloud-based repository first, like Dropbox, Google Drive, or Office365 OneDrive. From there you download your material to the computer.

There are plenty to choose from when you need to get a video editing software. [iMovie](#) for MacOS, and [Moviemaker](#) for Windows are easy. [Lightworks](#) for Mac/Win/Linux is powerful but more complicated. All these are free. (Lightworks has also a Pro version).

Most likely you need some extra material too. Remember that it's easy to add graphs and text slides e.g. by creating them with your presentation application and exporting them as JPG files to be used as still frames on the video.

For sound effects and soundscapes, visit [Freesound.org](#). For background music go e.g. [ccMixer](#) or [Soundcloud](#). They all support CC licensing.

Here you will find some examples on using Youtube in and for vocational education:

Single videos for vocational education

- [German vocational education](#) (Standard YouTube license)
- European Pathway [Project: Facts and Trivia about Finland](#) (CC BY license)
- [Hospitality and Catering: Vocational and maths practitioners working together](#) (Standard Youtube license)
- [Instructions for using a pillar drill](#) (CC BY license)

Playlists for vocational education

- ["Kokkikilta" Catering studies playlist](#), in Finnish
- [Integrating literacy and numeracy](#), in English

- [Several VET playlists visualized on one map](#), in Finnish

YouTube channels for vocational education

- [InnoOmniaEDU](#) and its sub channel for catering “[Kokkikilta](#)”
- [IT Tallaght](#)
- [University of Applied Sciences Utrecht](#)

Sharing your content on YouTube

[YouTube](#) by Google is the most popular video hosting service. Most of the video content you encounter online is on Youtube even when it’s embedded on a website or on a learning platform. The reach of the platform is wider than the competitors’. The only issue with Youtube for educational needs is advertising that an ordinary user can’t avoid.

In order to upload videos or to take full advantage of its features you need a free Google account for logging in to Youtube. You can find instructions on uploading videos [here](#). YouTube is very generous on what and how much you can upload there once you’ve increased your initial [15 minutes upload limit](#).

As YouTube is the key service out there, we will discuss that service only. There are several others, most notably [Vimeo](#). It has both free and paid plans.

YouTube users create channels in order to upload and share their videos. Videos can be private (accessed only when logged-in), unlisted (accessed by a direct link), or public (visible to search engines too). In YouTube Creator Studio user can change settings like licensing, keywords, and subtitles. Youtube used to have a handy video editor but it is not available any more.

If you want to create content for your blog, website, or LMS, it’s best to upload your video to a video hosting service like YouTube first. It will convert the file so that any device can play it.

Using and remixing content by others

There is an abundance of good quality educational videos available, particularly for learners who can understand English. For vocational education curriculum issues, equipment etc. may limit the usefulness of open educational resources.

Creating a playlist helps you maintain a topic-based collection that has videos from several channels. The process differs somewhat when using a computer or a mobile device. See how to create playlists on [Google Support](#) or on [WikiHow](#).

You can also subscribe to YouTube channels. The subscribed channel will be shown on your menu, and you will get a notification whenever there is new content on that channel. There are many lists on useful educational YouTube channels, see eg. [TeachersWithApps](#).

When you need to embed public or unlisted videos, or even a whole playlist on your site or learning platform, find that video or playlist on YouTube, click on the Share button and select Embed. Find more

detailed instructions for YouTube [here](#). Vimeo supports open standard embedding. Find instructions to embed their videos [here](#).

You can create information-rich services using playlists. For example, the school library of the Finnish education provider Omnia has made a map of useful playlists for the competence areas of their students using [Thinglink.com](#), see here <http://oppiva.omnia.fi/videokirjasto/> (in Finnish only).

When you want to remix and use some video or audio content by others in your own project, check the license first. You can find it on the content page, eg. on Youtube below the video by clicking the “Show more” button. The Youtube search has filters so that you can restrict the listing to Creative Commons licensed content only.

There are other sites for open educational resources like videos, too. [Khan Academy](#) has produced hundreds of courses based on videos uploaded to YouTube. In [OER Commons](#) you have a nice set of tools to help finding open education resources.

How to use in vet

LAVORADIO – www.lavoradio.eu

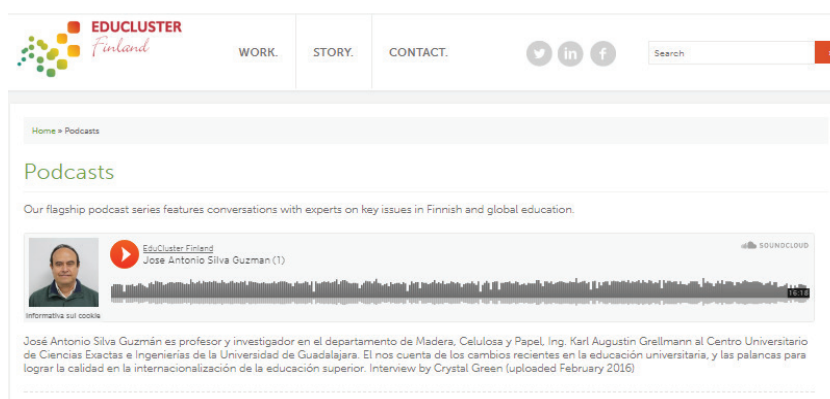
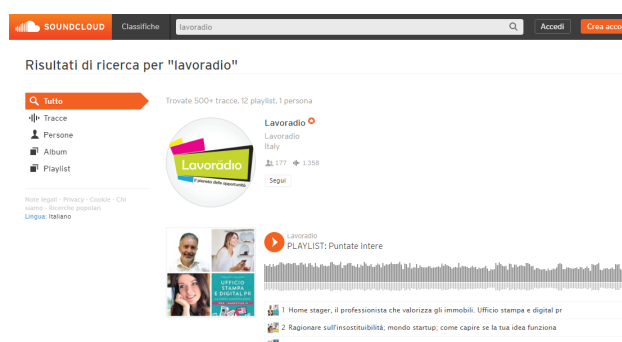
Lavoradio is a radio broadcast about job and employment transmitted on air in different radio stations in 9 Italian regions.

Every week a 16-minutes programme is also online in Podcast and in Soundcloud (<https://soundcloud.com/search?q=lavoradio>).

The Podcasts are used in several schools and VET centres because it is a way to talk and tell about stories, sharing experiences and provide suggestions to anyone that is looking for a job opportunity.

EDUCLUSTER FINLAND (ECF) is an expert organisation creating educational excellence. ECF operates in the fields of education system reform, quality assessment and performance development, professional development and teacher training, as well as supporting employability by vocational and higher education.

ECF provides some flagship podcast series featuring conversations with experts on key issues in Finnish and global education. They are available at: <https://www.educlusterfinland.fi/en/podcasts>



3.8 Social Media

Social media have triggered both opportunistic and critical reactions. As social media transcend particular sectors and societal segments, we see mostly the “not invented here” syndrome.

The recent book: **“Social Media, a Critical Introduction”** by Christian Fuchs (2017) highlights how social media continue to revitalize both economical, societal and political trends. For VET we may estimate that the acceptance of recently-new learning paradigms and its pragmatic usage will lead to:

- broaden the concept of learning and competence
- stimulate to transform the teacher/trainer role into mentor, coach and provider of identification
- start with assimilating social media in the CoPs for VET trainers first of all

Social Media for VET: What is its Contribution

Like any sector, also VET has a growing awareness that social capital needs to be maintained through face-to-face and social media as well. Before the teacher-student social media come in the picture, the role of social media in professional development is at stake; Especially in the case of new media, the learning and sharing among VET teachers is a vital process. Here are the elements that help to build WEB-based Communities swiftly.



Facebook

What is it

Facebook is a popular free social networking website that allows registered users to create profiles, upload photos and video, send messages and keep in touch with friends, family and colleagues. The site, which is available in 37 different languages, includes public features such as²¹:

- Marketplace - allows members to post, read and respond to classified ads.
- Groups - allows members who have common interests to find each other and interact.
- Events - allows members to publicize an event, invite guests and track who plans to attend.
- Pages - allows members to create and promote a public page built around a specific topic.
- Presence technology - allows members to see which contacts are online and chat.

How

You have to create an account on facebook.com.

Here are some tutorials about [how to use FaceBook](#).

Why is it useful in VET

The benefits for using Facebook is to connect students, tutors and teachers within learning communities, for sharing and discovering content and for communication and collaboration.

It is useful because it facilitates communication: create groups, schedule events, share multimedia, share interesting websites, facilitate classmate connections.

Links:

- <https://en.wikipedia.org/wiki/Facebook>
- <https://www.youtube.com/channel/UCcr9tciZbuvJrEVAglXCp8Q>
- <https://live.fb.com/about/>

Twitter

What is it?

Twitter is an online news and social networking site where people communicate in short messages called tweets. Tweeting is sending short messages to anyone who follows you on Twitter, with the hope that your messages are useful and interesting to someone in your audience. Another description of Twitter and tweeting might be microblogging.²²

Some people also use Twitter to discover interesting people and companies online and to follow their tweets for as long as they are interesting.

How to

Twitter is very simple to use as broadcaster or receiver. You join with a free account and Twitter name. Here is [How to create an account](#).

Why is it useful in VET

For educational purposes, Twitter can be used to select content from a wide range of sources or to create professional and collegial networks.

²¹ <https://whatis.techtarget.com/definition/Facebook>

²² <https://www.lifewire.com/what-exactly-is-twitter-2483331>

Exploring the potential of micro-blogging in formal and informal settings. When linked to a course or class blog, Twitter can offer students opportunities to discuss different kinds of online discourse, considering voice, purpose and audience; organize ideas; reflect and send notes; and manage meet-ups or serendipitous discoveries.²³

Actively engage students in their learning through information acquisition, critical thinking and collaborative activity.

Links:

- https://about.twitter.com/en_us/lets-go-twitter.html
- <https://en.wikipedia.org/wiki/Twitter>
- <https://study.com/academy/lesson/twitter-as-a-professional-communication-tool.html>

23 <http://www.uq.edu.au/teach/social-media-tools/twitter.html>

3.9 Asynchronous Communication

Asynchronous communication is communication where the participants do not need to be available at the same time. It includes computer-based exchanges of messages, without need for the sender and receiver to be time-synchronized, so they can read and respond as their desires. Examples include e-mail, discussion forums and text messaging over cell phones.

WordPress (CMS)

What is it

WordPress is a content management system.

A content management system (CMS) is a computer application that supports the creation and modification of digital content. It typically supports multiple users in a collaborative environment²⁴

Why is it useful in VET

A CMS like WordPress is easy for handling asynchronously information, to work together in projects, to share information between different persons or to organize online content between VET Partners. The WordPress application support the most popular desktop and mobile device applications for an optimised design and usability. The instructions are in different language available and a big online community support the open source application for a lot of computer systems.

How to implement in VET

Communication platform (Blog), online library (f.e. wiki), website (f.e. about a special event, institutional information etc.)

Links and Examples

- [WordPress Install](#)
- [WordPress Themes](#)
- [WordPress Handbook](#)

Description

CMS features vary widely. Most CMSs include Web-based publishing, format management, history editing and version control, indexing, search, and retrieval. By their nature, content management systems support the separation of content and presentation.

A web content management system (WCM or WCMS) is a CMS designed to support the management of the content of Web pages. Most popular CMSs are also WCMSs. Web content includes text and embedded graphics, photos, video, audio, maps, and program code (e.g., for applications) that

displays content or interacts with the user.²⁵

²⁴ https://en.wikipedia.org/wiki/Content_management_system

²⁵ https://en.wikipedia.org/wiki/Content_management_system.

How to

A well-made instruction is available to create a WordPress based site in 4 steps: **“Let’s create your new site”**.²⁶ You need a web address where your website is hosted. Then you install the main type of WordPress application (blog, website, portfolio, shop). After that procedure you can choose or change the final design template for your site. You can adapt in a simply and fast way the design and specify e.g. the main index, images or keywords for your personal requirements.

Not to worry! WordPress, like any skill, is one that can be developed through practice. All steps are well documented.

To get started developing your own site, it is essential to evaluate the way of communications inside VET groups!

- Blog to discuss and share ideas, images, material with VET teachers and learner
- Website to promote special issues, content to the VET learners
- Portfolio presentation of single results or persons
- Wiki to develop a multiple VET user online library

Implementation in vet – tips and exercise

TIPS

- Take a look to the online templates to find out the best structure for your project.
- Avoid long and complicate navigation path inside your side. A good usability it’s very important.
- Let student participate in the project. Often you find much faster a good solution for the structure of information. This concept could be used as effective way to introduce the approach in VET classes.
- Another possible way to implement in VET this approach could be connected with the consideration of the worst-case scenario as it forces to go over the fear that could block the creativity.
- If you start with a wiki you can use the “playground” for testing. It is a namespace which is pre-installed with the docuwiki plugin for WordPress.



EXERCISE

It is possible to work on a WordPress website project with multiple user?

You can pre-install for your VET class a lot of sites under the same domain e.g.

- www.domain.com/project01,
- www.domain.com/project02,
- www.domain.com/project03.

So every student can start with his own project. If you want to work on a wiki it is possible to share different tasks in one wiki with a group of students.

²⁶ <https://wordpress.com/start/design-type-with-store-nux/en>

WIKI (CMS)

What is it

A wiki is a website on which users collaboratively modify content and structure directly from the web browser.²⁷

Why is it useful in VET

A CMS like Docuwiki (wordpress plugin) is easy for handling non-hierarchic information, to work together on content-based projects, to share and develop information about special topics f.e. vocational education between different persons or teams between VET Partners. The Dokuwiki is easy to install and use, needs low system requirements, has a built-in Access Control Lists and a large variety of extensions. You can use it for over 50 languages and the software works device independent and under the Open Source license.

How to implement in VET

Communication platform (Blog), website (e.g. WordPress based CMS system)

Links and Examples

- Dokuwiki: [installer](#)
- Dokuwiki: [install multilingual plugin](#)
- Dokuwiki: [template bootstrap3](#)

Description

In a typical wiki, text is written using a simplified mark-up language and often edited with the help of a rich-text editor.²⁸ The usability of the most wiki software is very simply and easy to handle because the docuwiki plugin works with a low hierarchy. That means every user (with an access to wright) can wright or change a text or import an image or movie inside the wiki. He/she can mark up every word which is in relation to the next topic/explanation/sub theme etc. If you click on that new link you create directly the next site inside (or outside) the wiki and f.e. to write a next text about related topics. The wiki is easy to extend for other languages with a plugin f.e. multilanguage. You can manage the access for Dokuwiki with a simply Access Control List to allow to read, wright, create, delete rights. To check your pages can have a list of version history for a better control.

How to

If you use f.e. WordPress for your website host you will find a well-made instruction for a Dokuwiki under: [Let's install your Dokuwiki plugin](#).²⁹ You need a WordPress CMS based website. After login you upload the newest release of Dokuwiki plugin and install. After install you can choose more templates or your favourite template design for your wiki.

After the installing you start with the first site. In Dokuwiki, pages are created as in every other wiki. Simply create [a link from an existing page to a non-existing page](#), follow this link, and click on Create this page (on right menu in the default template). So, every user can create a new page which doesn't exist. Than they can wright a text or import an image about a new topic. As next he/she can mark up the word which is in relation for another topic/explanation/sub theme etc. If you click on that link you create directly the next page inside (or outside) the wiki. There are some alternative ways as well: You may enter the name of a new page directly in the search field, and click the "Search" button and can

²⁷ <https://en.wikipedia.org/wiki/Wiki>

²⁸ <https://en.wikipedia.org/wiki/Wiki>

²⁹ <https://www.dokuwiki.org/install>

choose Create this page (on right menu in the default template) of the results page. The new page will be named after your query.³⁰

Very simply! Dokuwiki, like some low skill, but is one that can be developed through practice. All steps are well documented.

To get started developing your own wiki, it is essential to evaluate the structure inside wiki!

- Single or multi-lingual?
- With or without a sidebar menu?
- Chose the best template and customize it for the best usability.

Implementation in vet – tips and exercise

TIPS

- If you start with a wiki you can use the “playground” for testing. It is a namespace which is pre-installed with the docuwiki plugin for WordPress.
- Let all partner participate at the beginning in the project. Often you find much faster a good solution for the structure of information.
- Take a look to the online templates to find out the best structure for your project.
- Begin your page with a first level heading with a meaningful title.
- Nest headline levels in their correct order, sections in the second level should start with a second level headline.
- Break up your text in paragraphs by leaving an empty line between them. An average paragraph should not be longer than 10-20 lines.
- If your text is longer than a few (3-5) paragraphs, consider dividing it up into **sections** by adding second-to-fifth level headings.
- When your text gets longer than 2-3 screen pages, put a short abstract of the contents of the page after the first heading. When your page gets significantly longer consider splitting it up in multiple pages.
- If you have many links to other wiki pages or external resources, add a special section with further references (**see below**).
- If most of the pages of a namespace share a common structure add a **namespace template** so any new page can begin with that skeleton structure.
- Try to avoid overcomplicated namespace structures. Try to use short, easy to remember namespace names.³¹

Exercise

It is possible to work on a Dokuwiki with multiple user at the same time?

Yes, you can pre-install as much of users you want and give the special rights to work in the wiki. All these you can manage with Access Control List in the admin tools.

³⁰ <https://www.dokuwiki.org/page>

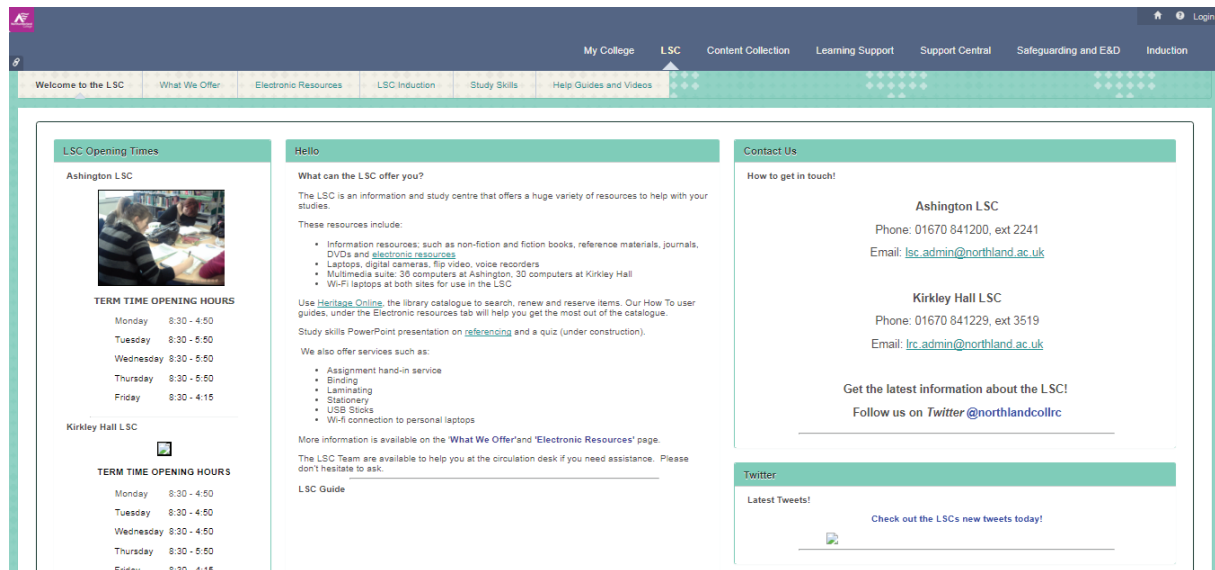
³¹ https://www.dokuwiki.org/tips:good_style

Examples

Northumberland College Virtual Learning Environment (VLE)

Northumberland College is a further education college based in Ashington, Northumberland, England.

Blackboard is the virtual learning environment (VLE) which provides access to online course



The screenshot shows the Northumberland College Virtual Learning Environment (VLE) homepage. The page is structured with a navigation menu at the top, followed by a main content area with three columns. The left column, titled 'LSC Opening Times', lists the opening hours for Ashington LSC and Kirkley Hall LSC. The middle column, titled 'Hello', provides information about the LSC's resources and services. The right column, titled 'Contact Us', provides contact information for both locations. A 'Twitter' section is located at the bottom right of the main content area.

materials. This means students can study from college and home and it is available 24/7. Thanks to this platform, the learners are becoming part of the learning community.

The advantage of a Wiki integrated in the platform is to enable groups of learners based in different locations to collaborate on the research and production of assignments. A wiki tool is used alongside the college's Virtual Learning Environment (VLE), to support the course work by alternating the VLE static resources with a wiki supporting the activities such as the development of coursework and the dynamic exchange of ideas. The learners' community are activating the wiki discussion forum.

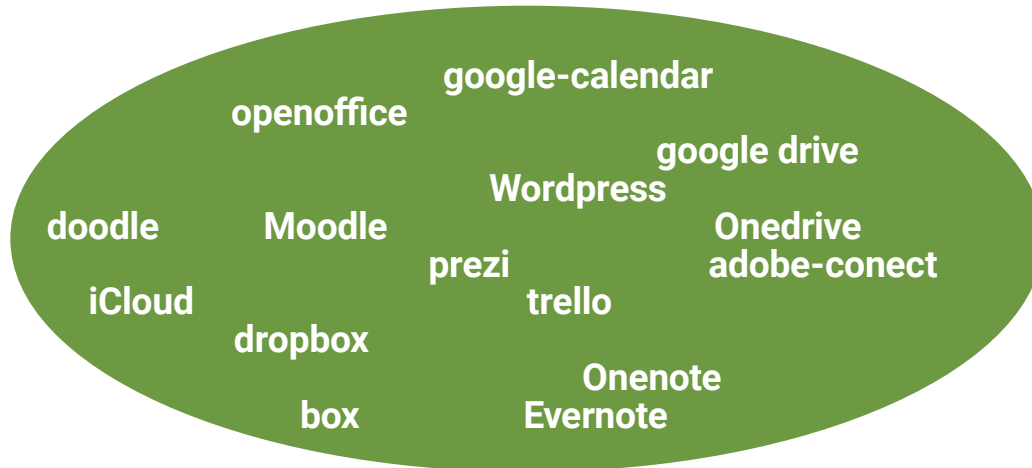
Links:

- <https://northumberlandcollege.blackboard.com>
- <https://prezi.com/gxjmmfnviv12/blackboard/>

Chapter 4. **Web 2.0 Tools
for COLLABORATION**

4.1 Collaboration tools

work in team, co-creation, calendars, doodle, brainstorming, to-do-lists, social bookmarking (Symbaloo), cloud (Dropbox, Google Docs)



4.2 Cloud Storage

Cloud Storage is a service where data is remotely maintained, managed, and backed up. The service allows the users to store files online, so that they can access them from any location via the Internet.

Cloud storage enables applications to upload data to a network of remote, connected servers. Applications can then maintain that data and access it from anywhere. Applications access data using a web-based API that works with client applications.

Storage is available in four main types:

- Personal storage: Services that enable individuals to store data and sync it across multiple devices.
- Public storage: A cloud storage provider that fully manages data for an enterprise offsite.
- Private storage: The cloud storage provider works on premises at an organization's data center.
- Hybrid storage: A mix of public and private cloud storage

The advantages of a Cloud Storage are:

- usability
- bandwidth
- accessibility
- disaster recovery
- cost savings

Google drive

What is it

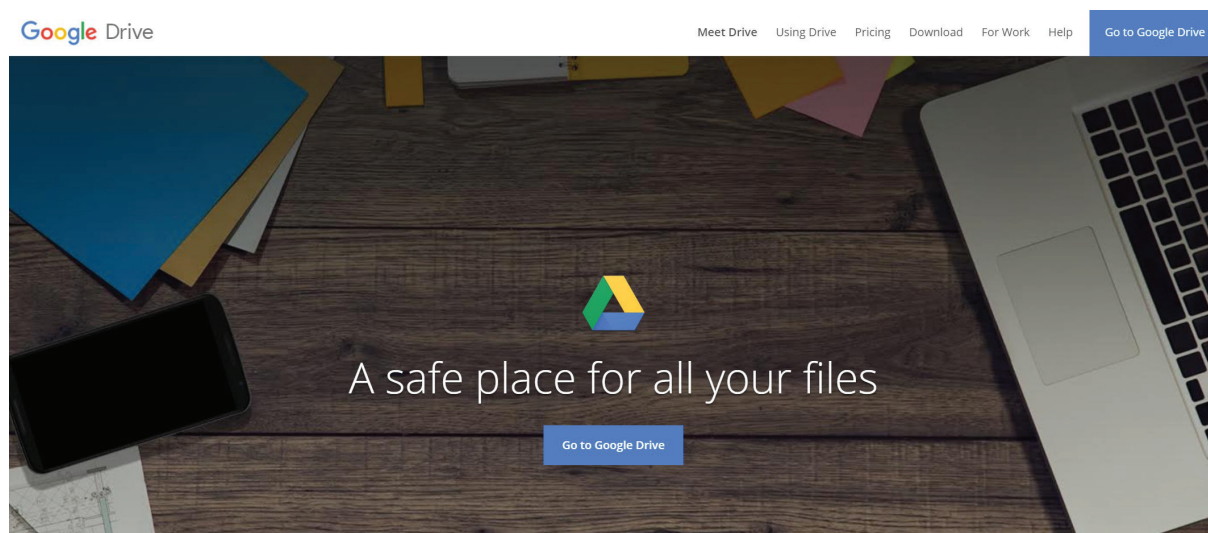
Google Drive is a file storage and synchronization service developed by Google. Launched on April 24, 2012, Google Drive allows users to store files on their servers, synchronize files across devices, and share files. In addition to a website, Google Drive offers apps with offline capabilities for Windows and macOS computers, and Android and iOS smartphones and tablets. Google Drive encompasses Google Docs, Sheets and Slides, an office suite that permits collaborative editing of documents, spreadsheets, presentations, drawings, forms, and more. Files created and edited through the office suite are saved in Google Drive.

Google Drive offers users 15 gigabytes of free storage, with 100 gigabytes, 1 terabyte, 2 terabytes, 10 terabytes, 20 terabytes, and 30 terabytes offered through optional paid plans.

Files uploaded can be up to 5 terabytes in size.³²

How to

You only need a [google account](#).



Why is it useful for VET

One of the most reasons to use Google Drive is that whether you are at the office, home or on a business trip, Google Drive allows you to access your files and folders from anywhere including your mobile phone. Your files are stored through Google cloud network. By accessing your Google account, you have full access to everything you need.

There is no need to worry about file conversions as Google Drive has the document, spreadsheet, power point and drawing apps you need so you can get to work no matter where you are.

Another useful feature is that you can upload and share files with your team. As files are written they are automatically updated and synced so that your team or customers can view the files in real time.

32 https://en.wikipedia.org/wiki/Google_Drive

Links:

- <https://www.google.com/drive/>
- <http://www.coolheadtech.com/blog/4-reasons-to-use-google-drive>

Dropbox

What is it

Dropbox is a global collaboration platform where files, folders, and docs are created, accessed, and shared. Dropbox is available online at dropbox.com and for Windows, Mac, or Linux computers, as well as Android and iOS phones and tablets.

Access your stuff wherever you are

Anything you add to Dropbox automatically syncs to all your computers, phones, tablets, and dropbox.com. Put your stuff in Dropbox and you'll always have access—wherever you are.

Share with confidence

No matter what device you're using or where you are, Dropbox makes it easy to share your files, folders, and docs. You can collaborate with co-workers on the go or show off photos from any device. Dropbox can even automatically upload photos and videos as you take them.

Safe and secure

Everything you put in Dropbox is private, and you control sharing. Dropbox stores your files with 256-bit AES encryption. You can also add an extra layer of protection to your account with two-step verification.

How

You have to create an account on dropbox.com.

Why is it useful for VET

You can share and submit work from your phone or tablet, you can keep lesson plans organized in Dropbox, share photos, files. So, any file you save to Dropbox is automatically synchronized to all your devices—your home computer, your work computer, your phone, and online at dropbox.com

Links:

- <https://www.dropbox.com/help/sign-in/dropbox-overview>
- [https://en.wikipedia.org/wiki/Dropbox_\(service\)](https://en.wikipedia.org/wiki/Dropbox_(service))
- <http://www.billselak.com/2012/dropbox>

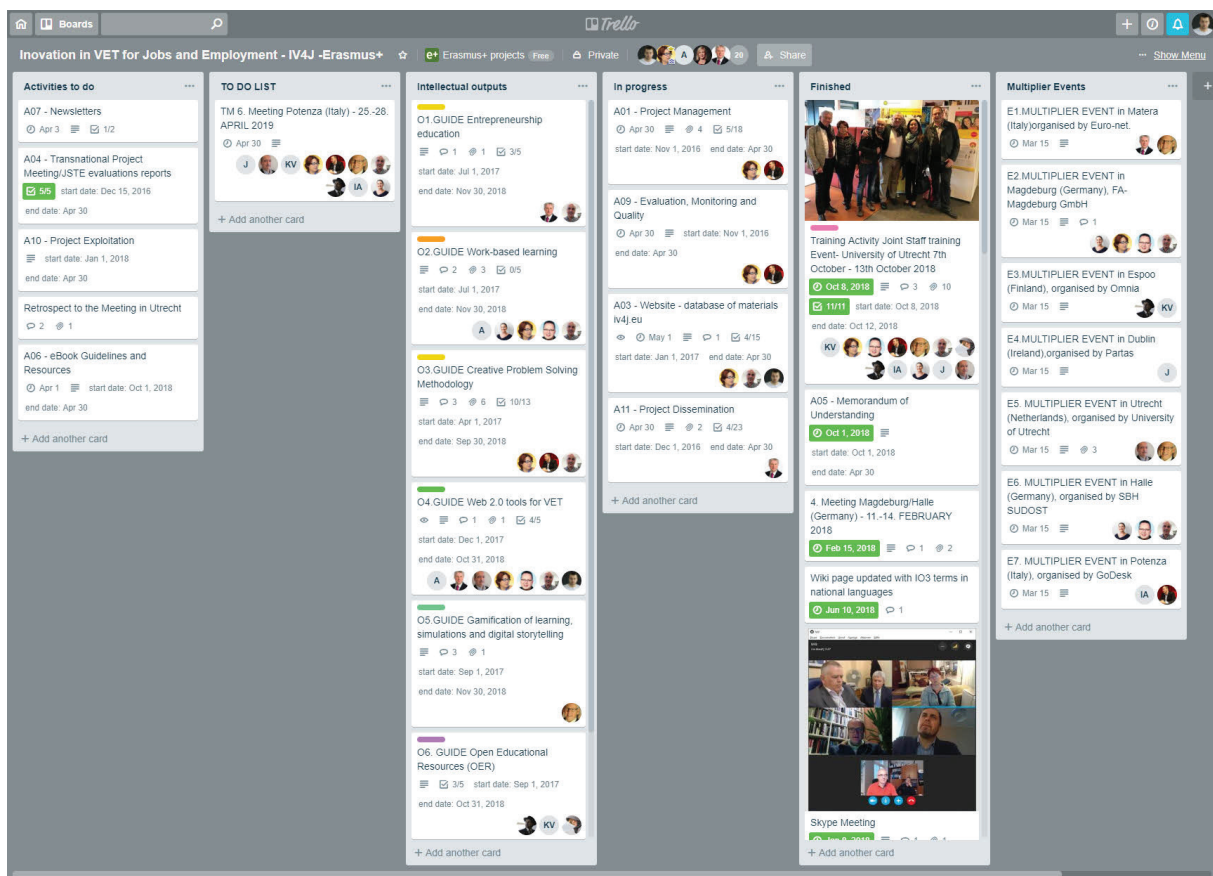
4.3 Kanban Board Organisers

Trello

What is it

A Kanban Board Organiser is a visual representation of work and workflow that enables effective participation of end-users and stakeholders in achieving optimal workflow. The development and use of leading software tools such as Trello and Meister Task have now overtaken the original usage of physical whiteboards, and moveable sticky-notes.

The overall aim of such tools is maximise communication and collaboration of project participants in a real-time, structured manner. Trello keeps project participants informed of key tasks and task assignments as they arise, with email notification and activity log capability. Project members can be added or deleted as required.



We have been using Trello for our IV4J project management tasks.

Key features of Trello are

- Overview of front and back of cards
- Drop and drag functionality
- Uploading of file attachments
- Ability to delegate and assign tasks

- Voting poll feature
- Search function
- Unlimited project/ files capability
- Free pricing for basic Trello
- Archiving feature
- Online Trello app.

Why are they useful for VET

Trello offers many important project-related benefits for teachers and students in VET.

Firstly, Trello is easy to use and fully customisable. The Trello card system can be used as a formal/ informal means of communication on homework assignments or projects provide links to course notes and multi-media educational material, assign peer-to-peer communication and collaboration and provide real-time updates on live seminars or project-tasks.

Trello provides effective project management of teaching and learning requirements, with the ability to assign and create tasks, start discussions, add attachments and email/ text alerts and notifications. Files can be added from Dropbox, OneDrive or Google Drive. Students can benefit from real-time adjustments to projects when working collaboratively and across geographies on projects.

Trello has a powerful search, filtering and labelling capability, facilitating management and negotiation of a complex and extensive curriculum of course materials, projects and deadlines. Such facilities and features are particularly useful for longer programmes, theses, on-job assignments, projects etc.

Trello is free for its basic service and has an app on iPhone and Android for mobile users. The web version supports all major browsers and can be accessed from all standard electronic devices. The business version of Trello includes features such as administrative controls, filter boards, added security features and connection to services in Salesforce, Evernote, and Google Drive etc.

Trello is real-time, for example, when a card is added, removed or moved on a board, it simultaneously moves on all other boards without end-users having to refresh or re-open tabs after screen lock-downs or power-outage.

Trello keeps data secure and private through a secure SSL/ HTTPS connection and encryption technology system. Because the vendor provides off-site storage of information, teachers and students are at less risk of data loss and corruption

How to

To see how Trello works you can view the videos that we have prepared for you:

- [Trello-demo](#)
- [Trello-intro](#)
- [Trello-setup](#)

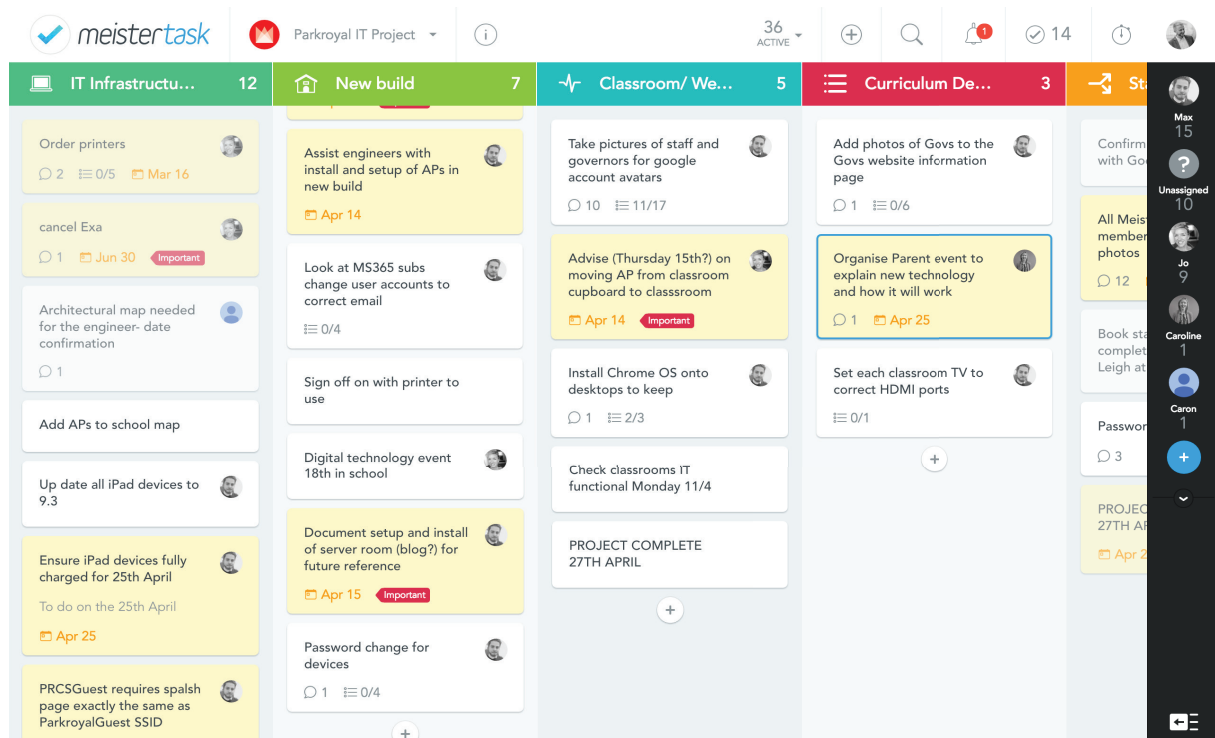
Links

- <https://trello.com/>
- <https://www.mindmeister.com/>
- <https://kanbanflow.com/>
- <https://www.projectplace.com/>

MeisterTask

What is it

MeisterTask is very similar to Trello. Both are Kanban style organizers. Like Trello, MeisterTask relies on columns for organizing information. The main difference is that MeisterTask focuses more on task management whereas Trello can be considered just as good for organizing any piece of information. So in MeisterTask, the task is the most important module. Each task can contain checklists, attachments, due dates, and time-tracking. Also, each task can be assigned to a single person at one time.



Source: <https://www.meistertask.com/blog/5-ways-apply-project-management-in-school/>

MeisterTask also has a feature called task automatons. With this handy feature, you can set up rules to update certain task features once it's moved to a different section.

Meistertask also integrates with other web 2.0 tools like Office 365, Slack and GitHub.

You can see both the similarities and the slightly different focus areas of Trello and MeisterTask by comparing the naming of the almost identical organizational elements:

MeisterTask	Trello
Project	Board
Section	List
Task	Card
Tag	Label

Why is it useful for VET

You could use it just for planning your class activities and share them with fellow teachers without involving the students, but MeisterTask would be better used together with your students to give assignments, track the work that's being done on them, see the time a student takes to complete an assignment and more. Both the students and teachers would have a good overview of what's being done what needs to be done and who needs to do it. It's also a good tool to communicate about specific tasks or assignments. Like Trello, you can also use attachments, so you can distribute learning materials or you can receive work from students.

How to

If you would like to learn how to use MeisterTask, the best option would be seeing their help page³³ or viewing their video library³⁴ on YouTube.

Links

video library - <https://www.youtube.com/channel/UCxKRNRpaNof6SNszGcyCIWg>

help page - <https://support.meistertask.com/hc/en-us/categories/200435011-MeisterTask-Resources>

using Meister Task in school - <https://www.meistertask.com/blog/5-ways-apply-project-management-in-school/>




³³ <https://support.meistertask.com/hc/en-us/categories/200435011-MeisterTask-Resources>

³⁴ <https://www.youtube.com/channel/UCxKRNRpaNof6SNszGcyCIWg>

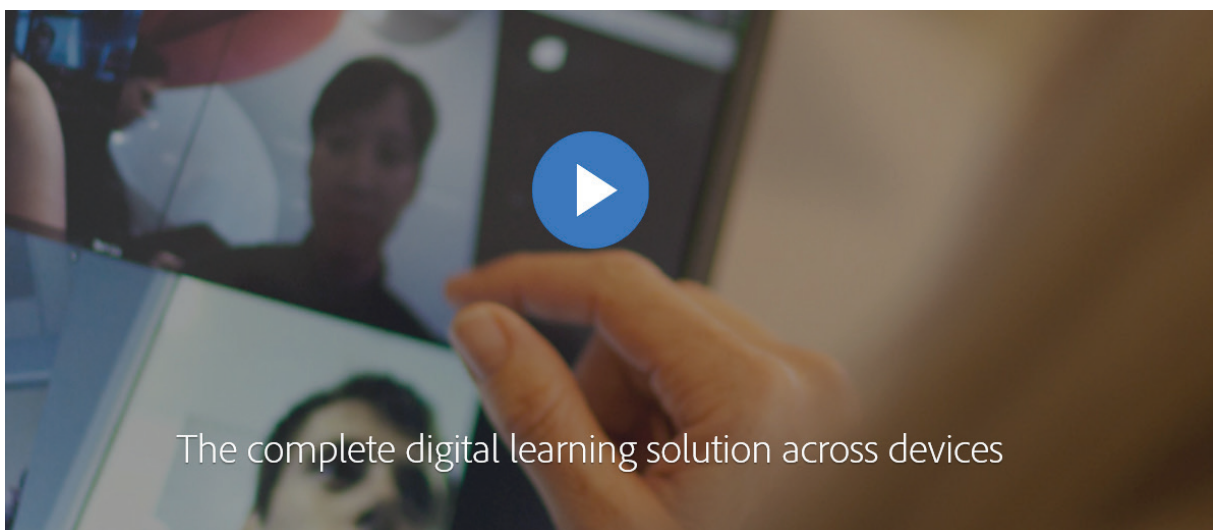
4.4 Learning platforms

Adobe Connect

Adobe Connect web conferencing software service offers immersive online meeting experiences for collaboration, virtual classrooms and large-scale webinars³⁵.

Adobe Connect Meetings	Adobe Connect Webinars	Adobe Connect Learning
		
<p>Discover the true power of online meetings</p>	<p>The all-in-one webinar solution for marketers</p>	<p>The complete digital learning solution for trainers</p>
<p><i>Adobe Connect Meetings includes:</i></p> <ul style="list-style-type: none">• Access across devices• Personal digital office• Rich recording and editing tools• Highly secure communication and compliance	<p><i>Everything in Adobe Connect Meetings, plus:</i></p> <ul style="list-style-type: none">• Immersive experiences• Robust registration• Fully customizable events• Built-in analytics	<p><i>Everything in Adobe Connect Meetings, plus:</i></p> <ul style="list-style-type: none">• Engaging content delivery• Mobile learning across devices• Immersive classes live and on-demand• Efficient training management and tracking
<p>View more ></p>	<p>View more ></p>	<p>View more ></p>

<https://www.adobe.com/products/adobeconnect/learning.html>

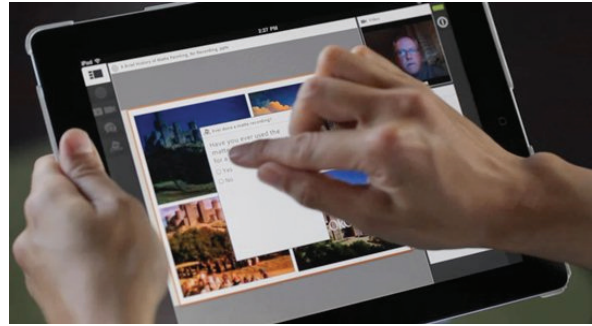


<https://images-tv.adobe.com>

35 <https://www.adobe.com/products/adobeconnect.html>

Enable mobile learning across devices

- Train and participate directly from mobile devices
- Deploy interactive mobile experiences including breakout sessions
- Enjoy hosting, file sharing, whiteboarding, and emoticons via mobile
- Allow participants on desktop to enter hassle-free with no downloads



<https://www.adobe.com/products/adobeconnect/learning.html>

Deliver immersive live virtual classroom experiences

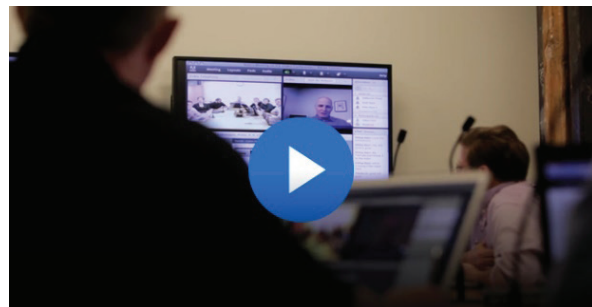
- Measure live learner participation with engagement monitoring
- Brand-able, customizable and persistent virtual classrooms
- Streamline live session management with intuitive backstage tools
- Maximize engagement with extensive interactive options



<https://images-tv.adobe.com>

Support blended learning with synchronous and asynchronous content

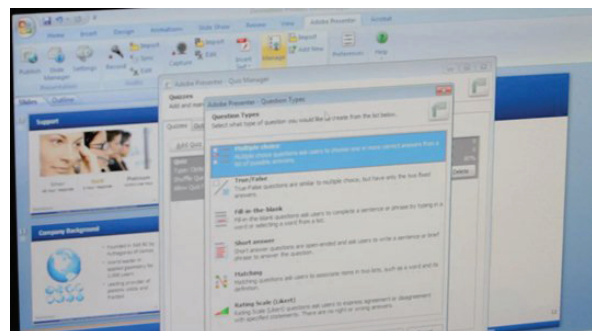
- Create curricula with prerequisites and test-outs
- Manage enrolment notifications & reminders
- Generate course catalogues to enable self-enrolment
- Measure effectiveness with detailed learner reports



<https://images-tv.adobe.com>

Create and deploy engaging on-demand learning content

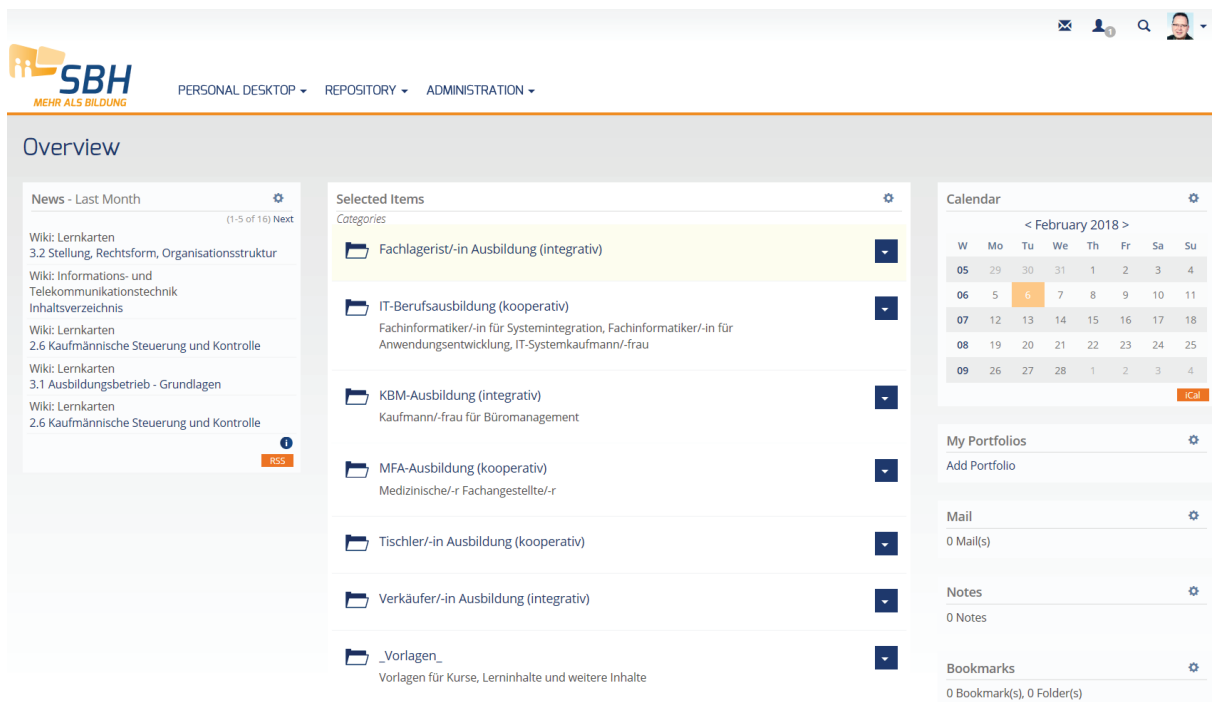
- Generate structured curricula with enhanced learner enrolment management
- Rapidly generate and deploy content using our Microsoft PowerPoint plug-in Adobe Captivate and Adobe Presenter
- Create content once and publish across devices, including SCORM and AICC content
- Use the features of a Learning Management System (LMS) at a fraction of the cost with Adobe Connect, or integrate it with your existing LMS



<https://www.adobe.com/products/adobeconnect/learning.html>

Ilias

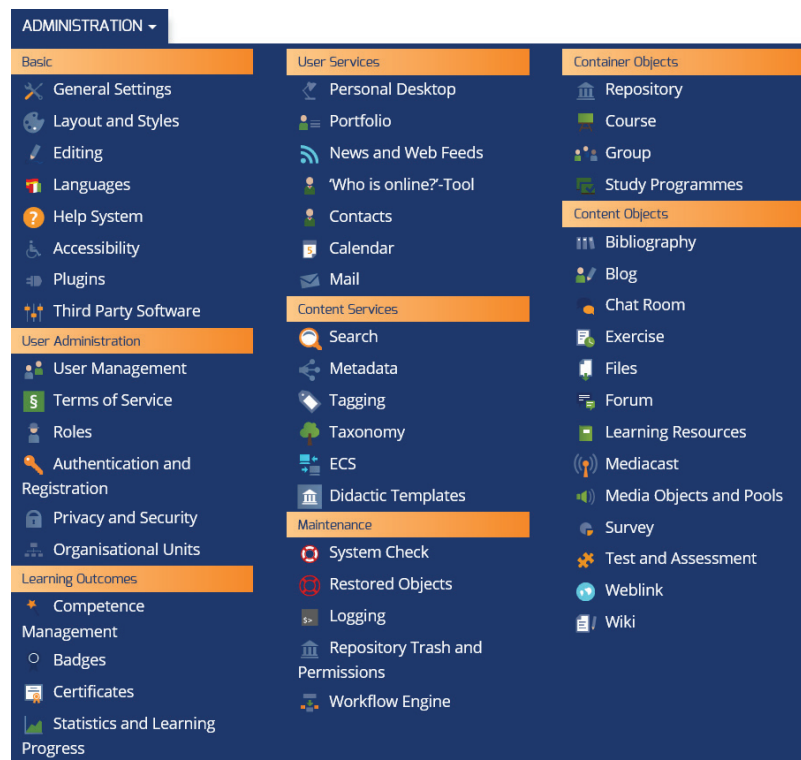
The concept behind ILIAS is to offer a flexible online working and learning environment with integrated tools. It goes far beyond the idea of learning being confined to courses. Rather, ILIAS can be seen as a type of library, providing learning and working materials at any location of the repository.



ILIAS is not a locked warehouse but an open knowledge platform

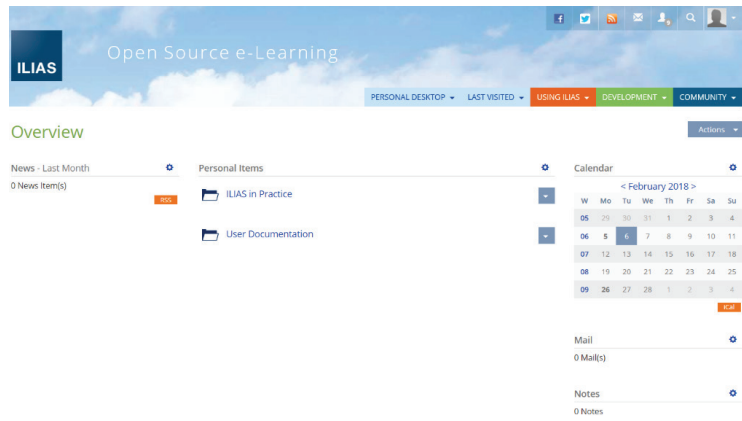
Ilias is versatile:

Course management, learning modules, test & assessment, portfolios, surveys, wikis and blogs are all built into the core, making ILIAS a “one-stop solution” for your e-learning needs.



ILIAS is open source:

No licensing fees, ever. Any special requirements can be implemented by our service providers. A voluntary membership to the ILIAS Society is inexpensive and grants you direct influence on the long-term development process. www.ilias.de - in eight languages.

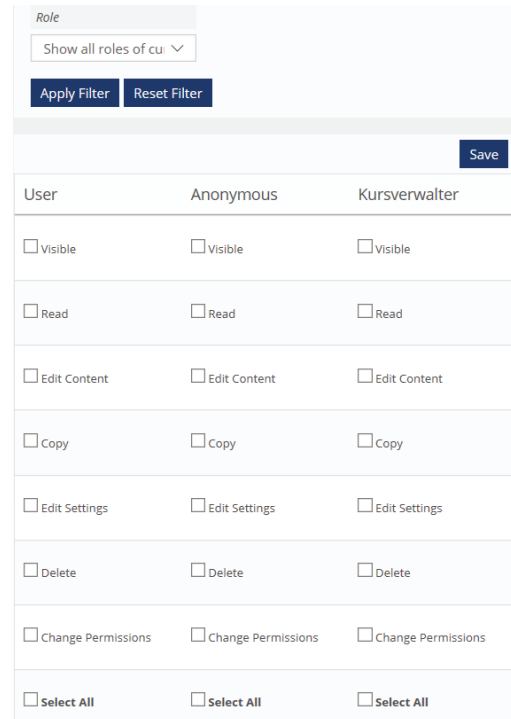


ILIAS is yours:

Change its look, implement your preferred learning scenarios, integrate it with your website or intranet, activate only the modules you need, give each user the exact access and permissions you specify.

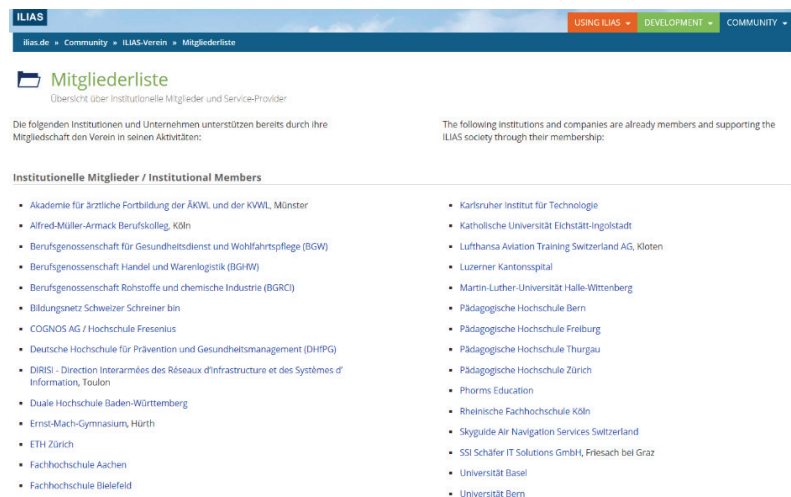
ILIAS is standard-compliant:

SCORM 1.2 and SCORM 2004 learning modules. LOM metadata. IMS QTI Test&Assessment. XML, CSV and Excel exports. IMS LTI to embed external applications. Once installed, the complete ILIAS suite runs directly in your browser: No further software is needed for either learners, tutors or content creators



ILIAS is trusted:

In development since 1998, it is now supported by 11 premium partners and more than 40 institutional ILIAS Society members. It has thousands of active installations, and is being used by millions of users worldwide³⁶



<https://www.ilias.de/docu>

ILIAS is the Learning Management System that can cope with anything you throw at it: 100 or 100.000 users. Desktop or mobile. Use it as a simple course player, a complex authoring tool, a full-fledged collaboration platform - or all of these combined!

Main Features

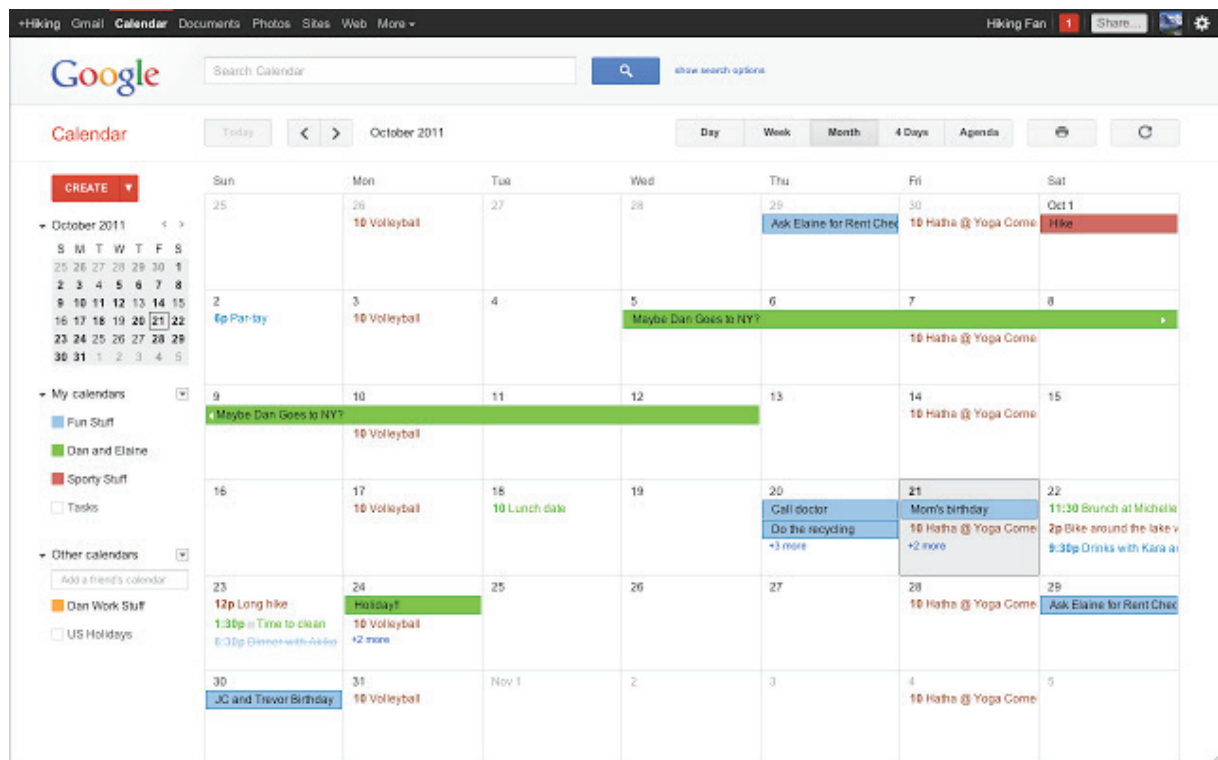
- Full support of SCORM 1.2 and SCORM 2004
- Powerful Test & Assessment tool that allows you to offer both self-evaluations for your learners, as well as complete e-exams
- Flexible Course Management for a multitude of didactical scenarios
- Study Programs allow you to reproduce full curriculums with a single tool
- Content sharing with really fast Drag&Drop File Upload
- Personal Workspace for learners, allowing the easy creation of portfolios and blogs
- Simple creation of study materials with our Authoring Tools: Build learning modules, wikis, glossaries, and much more...
- Streamlined Design: Despite their usage differences, usability of all tools in ILIAS is held very similar - making it easy to explore new learning scenarios!
- Learning Communities that help you bring your learners together...
- ...based on the integrated Communication Tools: Personal profiles, Contacts, Who is online tool, mail, chat and more...
- Highly developed Access Management allows you to fine-tune your permissions for each and every object
- No Lock-In: Your data can be exported in XML format

4.5 Scheduling and time management

Google Calendar, Yahoo Calendar

What is it

Google Calendar is a time-management and scheduling calendar service developed by Google. It became available in 2006 and it is available on the web and as mobile apps for the Android and iOS mobile operating systems. Google Calendar allows users to create and edit events. Reminders can be enabled for events, with options available for type and time.



https://lh3.googleusercontent.com/a/JetsFMWLOqJb5vXeNPA4XUaof-F_xsPq4Ck-upR9RqUq0W_yktmlogSmXowGyUyRfVn9ZKt=w640-h400-e365

Event locations can also be added, and other users can be invited to events. Users can enable or disable the visibility of special calendars, including Birthdays, where the app retrieves dates of births from Google contacts and displays birthday cards on a yearly basis, and Holidays, a country specific calendar that displays dates of special occasions

Yahoo Calendar is a Web-based calendar service from Yahoo!. It can read calendar feeds and events syndicated from sites that make use of the published Yahoo calendar programming interfaces. While users are not required to have a Yahoo Mail account, they are required to have a Yahoo ID in order to use the software.

Why is it useful for VET

It is useful to coordinate and plan activities within participants to an activity or project.

Because they are connected to the main free email account providers (Gmail, Yahoo), it is a perfect way to synchronise the agendas within participants e.g. to a project in a class.

How to - Google Calendar

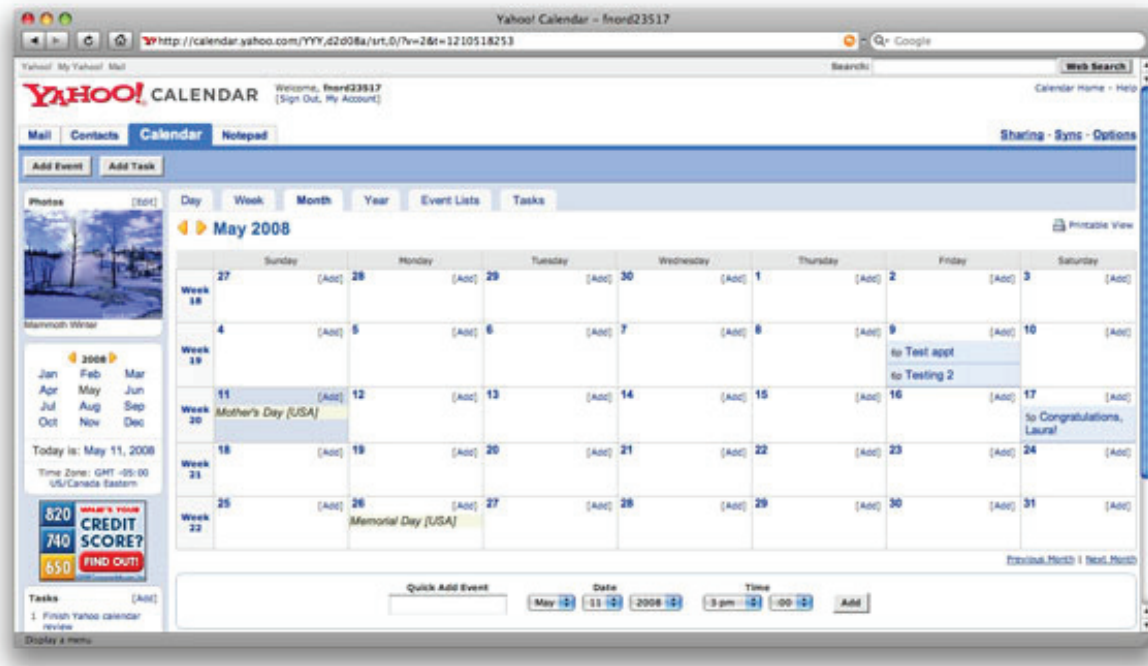
1. Access Google Calendar. Open a new web browser tab or window and go to [Gmail](#).
 - Provide your Gmail email address and password in the fields given. If you do not have a Gmail account, create one easily by hitting the “Create an Account” link below the login window.
 - Click on the apps icon (bold dots in 3 rows and 3 columns, forming a square) at the top right of the page.
 - A pop-up will appear showing a number of Google applications, including Google+, Google Drive, Maps, News, YouTube, and Calendar. Click “Calendar” to go to the Google Calendar application
 2. Create an event. To begin creating an event, click the “Create New” button. It’s the red button found on the left side of the page. You will be directed to a page requesting you to input the details of the event.
 - Provide the name of the event in the first field. Just tap the “untitled event” words in the field and type in the name.
 - Below the title field, you will see the start date and time as well as the end date and time of the event. Pick the dates and times of the event in these fields.
 - In the “Where” field below date and time, enter the location where the event will take place.
 - Add a little something about the event in the Description field if desired.
 - If you want Google Calendar to email you a reminder (like letting you know one day before the event), set notification information in the Notification option. Under this option are 3 boxes. These boxes have drop-down menus. In the first box, select the way you want to be notified (e.g., mail or a pop-up window that appears when your computer is on and is connected to the Internet). The second and third box also contains a drop-down menu for selecting minutes, hours, days or weeks to set a specific date and time for the notification.
 - You can also choose to invite friends to the event by typing their email addresses on the “Add Guest” field. If you choose to invite friends, you have to specify their user rights. For example, they can invite other friends, view other invited friends, or modify the event.
 - Click the “Save” button to complete the process of creating the event. The “Save” button can be found at the end of the Create Event form. Next to this button is “Discard.” If you want to cancel the event creation, click this instead.
 3. View events. All created events can be viewed in the Agenda tab at the top right of the Calendar page.
- For a complete How to guide, please visit: <https://www.wikihow.com/Use-Google-Calendar>

How to - Yahoo Calendar

1. Step 1 -- Go to Yahoo Calendar: First of all, you need to be logged into your yahoo mail. For the purpose of this tutorial, we have already opened our yahoo inbox. Click on the calendar tab at the top of your screen to access the calendar.
2. Step 2 -- Create new event: Once the yahoo calendar opens up, click on the new event button. As a result, a new event pops up will appear on your screen. Over here, you can set the title of

the event, the starting and ending time and the location. You can always insert notes for the event as well. Once you are done with the details, click on the save button to create the event.

3. Step 3 -- Create To-Do tasks: Yahoo Calendar allows you to create To-Do tasks. Simply click on the to-do button, right next to the new event button. In the pop up that will appear, you can set the title and the due date. You can always leave notes for the to-do as well. Once you are done, click on the save button. If you want to add something else to the to-do list, click on the save and add another button. On the right-hand side, you will see the to-do pane. Alt text "Make To-Do tasks"



<https://images.macworld.com/images/reviews/graphics/133728-yahoocalendar.jpg>

4. Step 4 -- Change the view of the Calendar: You can always change the calendar view by going to the top and clicking on the day button. The calendar will be broken down into the 24 hours available in the day. You can change it to weekly, monthly or yearly. Alt text "Change the calendar view"
5. Step 5 -- Delete a To-Do: Furthermore, the To-Dos that we made can be seen in the extreme right corner of the page. Right click on a to-do and select the mark as done option if you have completed the task. You can always delete a to-do by simply clicking on it in order to open it and then clicking on the delete button. You will be displayed with a warning message. Click on the delete button to delete the to-do for good. In this manner, you can work use Yahoo calendars.

- Video tutorial: <https://www.youtube.com/watch?v=PXtLSToaMJg>

Links

- <https://calendar.yahoo.com/>
- https://en.wikipedia.org/wiki/Yahoo!_Calendar
- <https://www.wikihow.com/Use-Google-Calendar>

Doodle

What is it

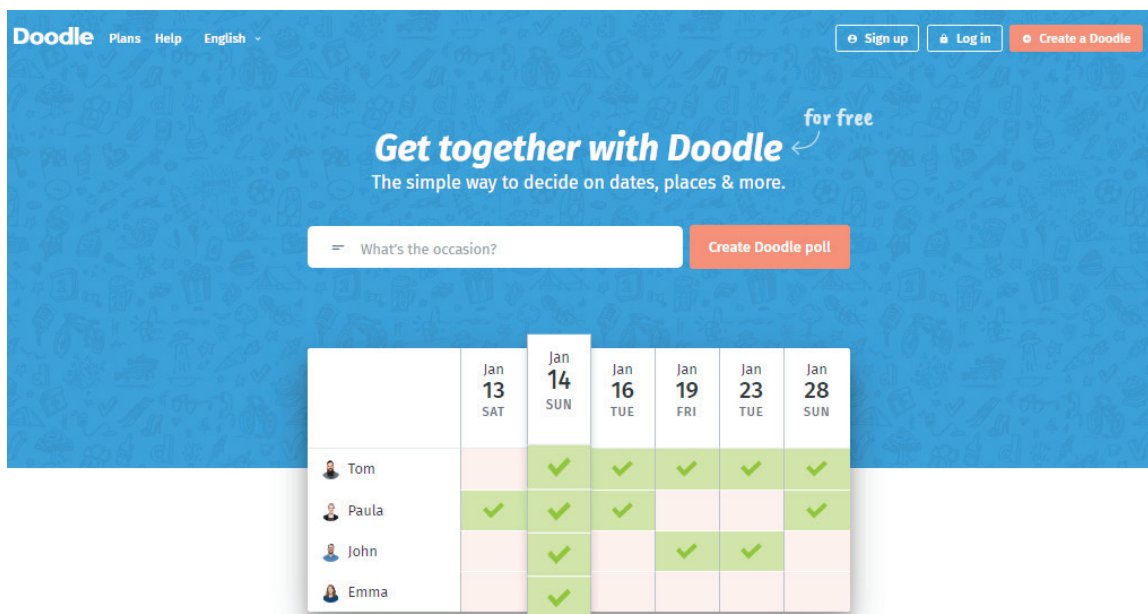
Doodle is an online scheduling tool that can be used for time management, and coordinating meetings. It is possible to find a date and time to meet with people.

After a suggestion for dates and times for an event, the participants are able to choose, then Doodle creates a polling calendar that can be sent to participants for feedback. As each participant selects the dates and times from the polling calendar that he or she is free, Doodle aggregates the responses and tells you which option works best for everyone.³⁷

Doodle can be a valuable tool for coordinating a large event like volunteer training as well as a small event like a monthly meeting with the board.

Doodle is based in Zurich, Switzerland and has been operational since 2007.

It is available in 26 different languages, written in JavaScript and the slogan used by the company to describe the tool is: "Easy scheduling"



Compare availability to find the best time for everyone to meet.

Source: 10/01/2017 from https://doodle.com/en_GB/

Why is it useful for VET

It is essential to organise and manage the work in groups in accordance with the participants' availability and planning needs.

It could be used to plan meetings, events and simple surveys.

How to

- Suggest options: select dates, places, or preferences for the Doodle poll;

³⁷ <https://doodle.com/graphics/static/facebookSharingThumbnail.png>, 10.01.2018

- Invite participants to vote: With the invitation, participants can select their preferences without an account needed;
- Select the best option: Once the votes are in, it is possible to pick the final option in few seconds.

Other features

- Calendar Integration: it is possible to connect a calendar to create and participate in polls directly from Doodle's calendar view. Doodle also automatically syncs the events;
- Personalized dashboard: Management of the Doodle polls from one organized place with an immediate view to all the polls from a dashboard (the ones you've created and also the ones you've participated in).
- Doodle everywhere: Track the Doodle polls on the go and receive activity notifications. The free Doodle app works seamlessly with all major devices. (AppStore, Google Play)
- Simple surveys: the participants could vote on anything with an easy-to-use interface.

PREMIUM features:

- Customized branding: Replace the Doodle logo with own personal brands/images.
- Request contact information: Ask for the participants' email addresses, mailing addresses, or phone numbers.
- Ads-free: it is also possible to provide a clean, ads-free experience. No ads. Just Doodle.

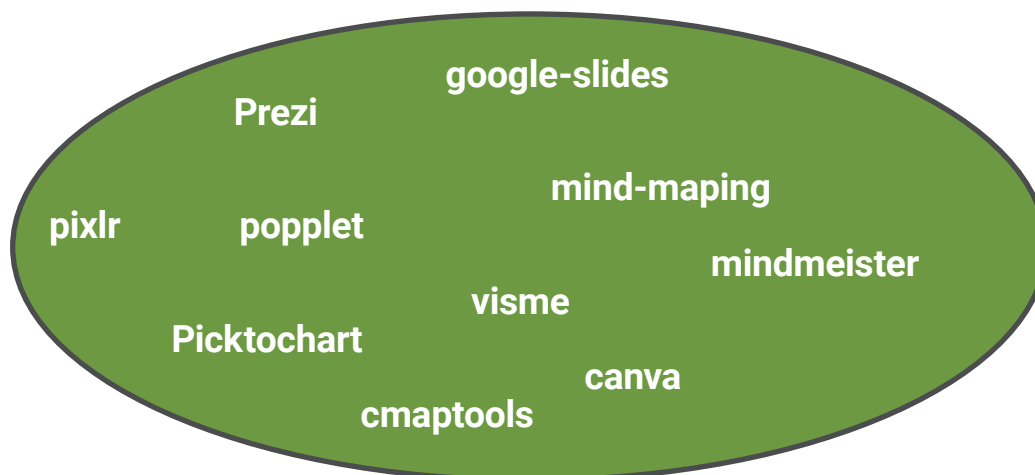
Links

- https://doodle.com/en_GB/
- <https://en.wikipedia.org/wiki/Doodle.com>

Chapter 5. **Web 2.0 Tools
for CREATIVITY**

5.1 Creativity tools

- enhance creativity with tools using words, pictures, sounds, online Design Thinking Methodology e.g. Scratch, E-toys



5.2 Presentation tools

Prezi

What is it

Prezi is a web-based presentation software, created in Budapest (Hungary) in 2009. The word Prezi is the short form of “presentation” in Hungarian.

It is a visual storytelling software alternative to traditional slide-based presentation formats. Prezi presentations feature a map-like, schematic overview that lets users pan among topics at will, zoom in on desired details, and pull back to reveal context.

Prezi is compatible with most modern computers and web browsers and it is an HTML5 application which runs on JavaScript. It is available in English, Portuguese, Spanish, Korean, Japanese, German, Italian, French, Hungarian.

Why is it useful for VET

Because it is designed for people who aren’t designers and could be started with several templates.

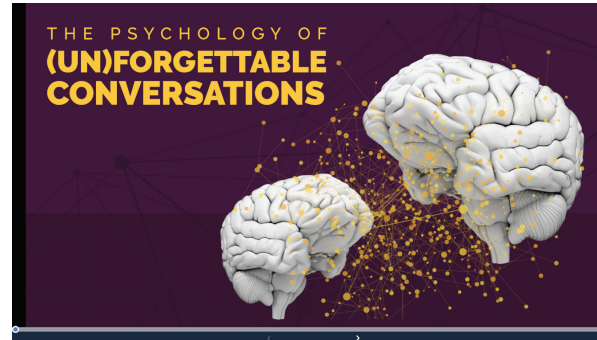
The presentations created are different from the common MS PowerPoint because it permits a Conversational Presenting: the term was coined by the company in 2015 to describe the organic flow of information Prezi enables. By letting presenters adapt the order of their content delivery, this method allows questions and concerns to be addressed as they arise, rather than according to a scripted path.



How to

- Creation: thanks to a creative and intuitive interface Customise: by choosing a designer template, selecting a wide range of fonts and colours, importing media, adding photos, videos, and PDFs.
- Insert charts: by creating charts and zoom in to reveal the stories behind your data with supporting text, images, or videos.
- Collaboration: work in cloud together with others
- Present: deliver your presentation on desktop, mobile devices (via APPs)
- Analyse the data thanks to Prezi Analytics (Premium)

Examples:



Source 10/01/2018: <https://prezi.com/gallery/>

Links

- <https://prezi.com/>
- <https://en.wikipedia.org/wiki/Prezi>

Google slides

What is it

Google Slides is a free online tool to create, edit, collaborate and present, wherever you are.



Source: 09/01/2017 from: <https://static1.squarespace.com/static/>

It is based on online Google Docs package products and it includes a variety of presentation themes, hundreds of fonts, embedded video, animations and more. All free of charge.

It permits the access to the presentations anywhere, at any time – from the phone, tablet or computer – even when there's no Internet connection. It is also possible to work together in the same presentation at the same time. It is compatible with MS PowerPoint

Why is it useful for VET

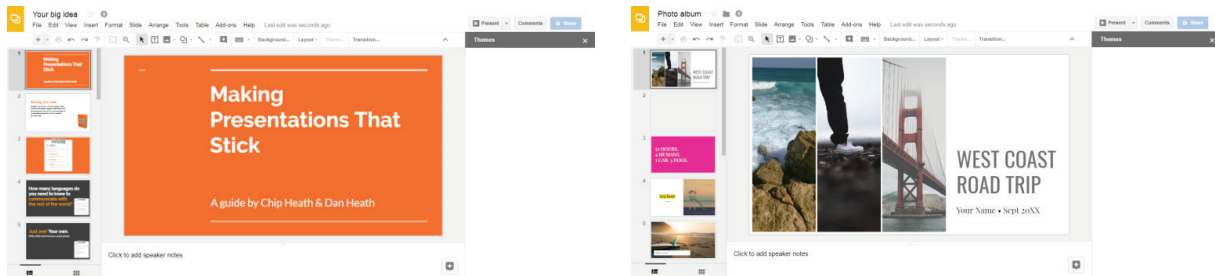
Because it is integrated with other Google Docs package products (Google Docs, Google Sheets and Google Forms) and also with Gmail and all APPs developed by Google.

It is perfect way to access to several themes, fonts and materials free of charge.

How to

- Access from your PC or download the APP for Android and iPhone/iPad
- Start a new presentation or select a template from the gallery
- Edit the form as MS PowerPoint
- Share the form online thanks to the integration with Google Drive cloud
- Save, download, export in MS PowerPoint, PDF

Examples



Source 10/01/2018: <https://docs.google.com/presentation/u/0/>

Links:

- <https://docs.google.com/presentation/u/0/>

5.3 Mind Mapping

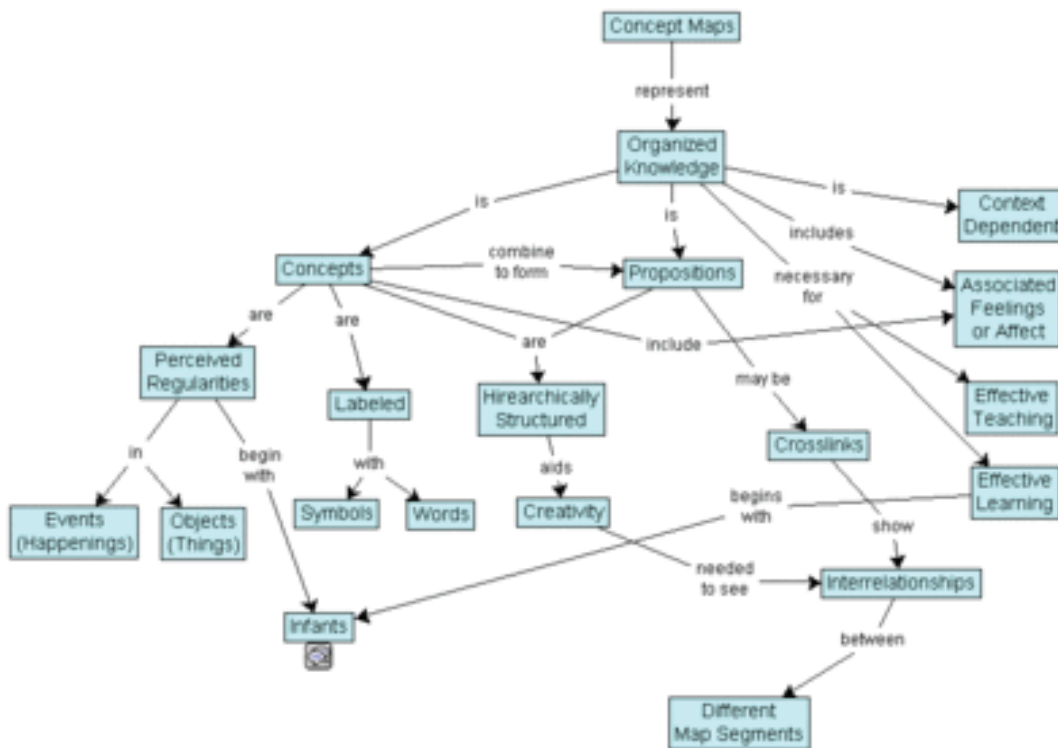
What is it

Mind mapping (or “idea” mapping) has been defined as ‘visual, non-linear representations of ideas and their relationships’ (Biktimirov & Nilson, 2006). Mind maps comprise a network of connected and related concepts.

Why it is useful for VET?

Mind-mapping software can be used to organize large amounts of information, combining spatial organization, dynamic hierarchical structuring and node folding. Software packages can extend the concept of mind-mapping by allowing individuals to map more than thoughts and ideas with information on their computers and the Internet, like spreadsheets, documents, Internet sites and images. Naturally, the new trend is making these tools available to iPhone, iPad and Android mobile platforms.

How



Buzan makes the following recommendations when mind mapping (Buzan & Buzan, 2000).

1. Place an image or topic in the centre using at least 3 colours
2. Use images, symbols, codes, and dimensions throughout your Mind Map.
3. Select key words and print using upper or lower-case letters.
4. Each word/image is alone and sitting on its own line.

5. Connect the lines starting from the central image. The central lines are thicker, organic and flowing, becoming thinner as they radiate out from the centre.
6. Make the lines the same length as the word/image.
7. Use colours—your own code—throughout the Mind Map.
8. Develop your own personal style of Mind Mapping.
9. Use emphasis and show associations in your Mind Map.
10. Keep the Mind Map clear by using radial hierarchy, numerical order or outlines to embrace your branches

The CmapTools Software Toolkit

The CmapTools (Cañas et al., 2004b) software (available for download at: <https://cmap.ihmc.us/>) developed at the Institute for Human and Machine Cognition brings together the strengths of concept mapping with the power of technology, particularly the Internet and the World Wide Web (WWW). The software not only makes it easy for users of all ages to construct and modify concept maps in a similar way that a word processor makes it easy to write text, it allows users to collaborate at a distance in the construction in their maps, publish their concept maps so anybody on the Internet can access them, link resources to their maps to further explain their contents, and search the WWW for information related to the map.

The software allows the user to link resources (photos, images, graphs, videos, charts, tables, texts, WWW pages or other concept maps) located anywhere on the Internet or in personal files to concepts or linking words in a concept map through a simple drag-and-drop operation.

Links:

- [Mind-mapping software](#)
- [Free mind mapping software](#)

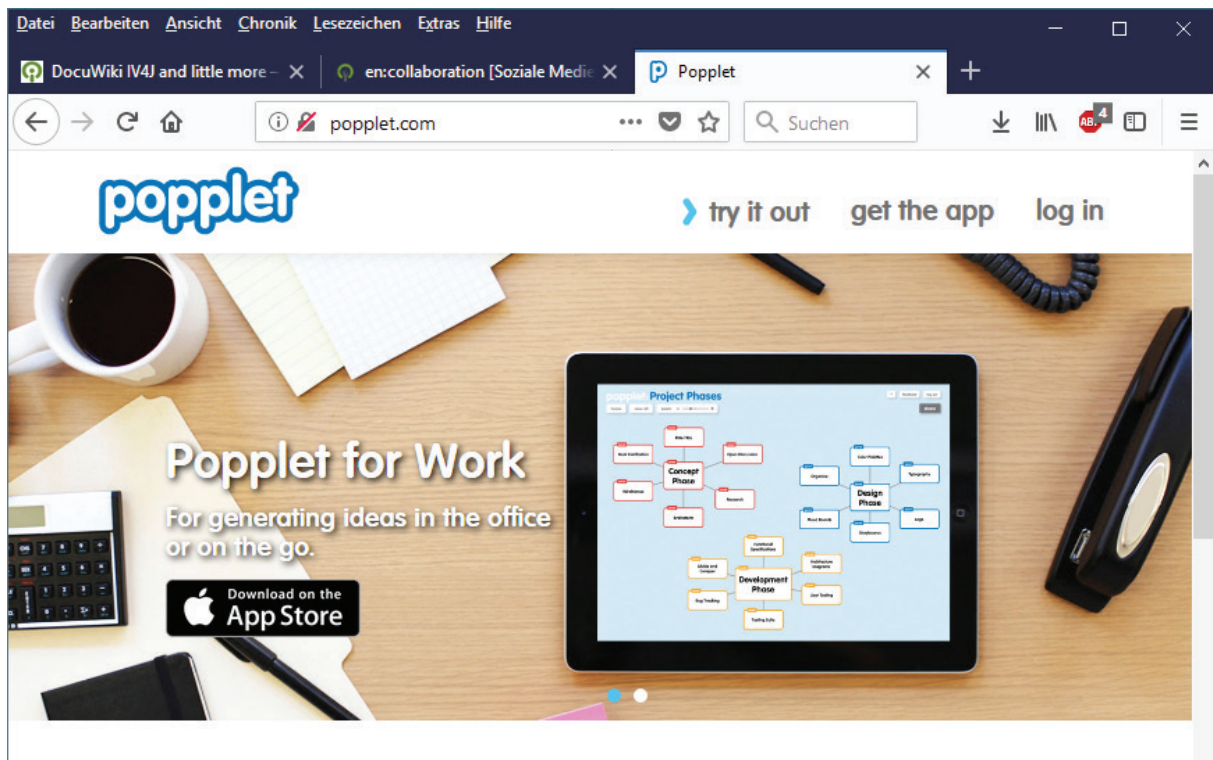
Popplet

What is it

Popplet is an online tool for visually organizing ideas and projects. This process is also referred to as 'mind mapping.' Popplet is available as a browser-based web tool or as an app for mobile devices and tablets. We will be focusing on the web tool as it presents the most functional free version of the experience.

The iOS app version limits you to just one project in the free, or 'Lite' version. The full version costs \$4.99. If you head over to Popplet.com you can start to see how the tool works. Basically, you create connections and clusters between ideas or tasks on a virtual whiteboard. So, you might use Popplet to present your research on a particular subject, adding details around and connected to your core subject.

Or you could use it to map out the various phases of a project, clustering the detailed steps around each phase. The great thing about Popplet is that it's easy and intuitive to use and actually has a lot of great functionality within its feature set. This includes tools for collaborating with others on your



Popplet, as well as powerful tools for sharing your Popplet and using it for dynamic, visual presentations.³⁸

Popplet allows your students to do: https://www.youtube.com/watch?v=v8N6lbc_Vck

How to Make a Popplet, a Mind Mapping Tool: <https://www.youtube.com/watch?v=GkKg2qKnsRw>

How to

To see how Popplet works you can view the videos that we have prepared for you:

[Popplet Overview](#)

[Popplet Demo](#)

Links

- <https://popplet.com/>
- <http://popplet.com/app/#/public>

Mindmeister

What is it

MindMeister is an online mind mapping application that allows its users to visualize, share and present their thoughts via the cloud. MindMeister is a collaborative online mind mapping software that's both versatile and easy to use. Students of all ages can utilize MindMeister to study more efficiently, unleash their creative potential and get ahead in their educational career.

Online mind mapping is a simple yet powerful tool that can greatly benefit students of all ages. The benefits are: improved memory and recall, free flow of ideas, structured information, and better communication.

How to

MindMeister provides a way to visualize information in mind maps utilizing user modeling, while also providing tools to facilitate real-time collaboration, task management and creating presentations. Here you can see [how to create your own map!](#)

Why is it useful for VET

Now, innovative Web-based technologies have made these tools available to distance educators and trainers. Online mind maps facilitate teaching complex and multifaced topics while offering a visually rich and interactive interface that fuels students' curiosity and creativity. There are some important uses of Mindmeister:³⁹

- take better notes - write less, retain more
- engage and collaborate - work in group project and more
- research and write - outline essays and scientific papers
- create presentations - visualize and communicate complex information

Links

- [Mind-mapping software](#)
- <http://www.imdevin.com/top-10-totally-free-mind-mapping-software-tools/>
- <https://www.mindmeister.com/741431317?new=1>
- https://en.wikipedia.org/wiki/List_of_concept-_and_mind-mapping_software
- <http://www.educatorstechnology.com/2012/06/18-free-mind-mapping-tools-for-teachers.html>
- https://www.mindmeister.com/?gad_campaign=World_brand&gclid=CjwKCAjw6djYBRB8EiwAoAF6ocl_Pw3ui2rvW1cLW0DDGicykdQYj6xNhT8fCeXI61mMz_IYavZVhxoCF3UQAvD_BwE#all
- <https://en.wikipedia.org/wiki/MindMeister>
- <https://www.youtube.com/watch?v=zHVcwapbs-k>
- <https://www.mindmeister.com/646318401/creative-presentation-tools>

39 <https://www.mindmeister.com/content/education>

5.11 Infographics Creation

What is it

Infographics are visual representations of information. Instead of having blocks of texts and boring tables that people will never read, you can give the same information in a different way by using an infographic that it is more friendlier and easier to understand.

You can create infographics very easy using online tools. In the last few years a number of online tools have emerged that allow anyone to create great visual content. Each new project starts with a template, so you can use it for a project for work, personal use, or social media.

These new tools are vector graphics applications that run in your browser as a replacement for using an expensive professional desktop application like Adobe Illustrator to put your infographic design together. Each one offers different tools, image libraries, charts, fonts and templates as a starting point. None of these have the full capabilities of a professional desktop application, but you probably don't need that much power to create a simple infographic.

Here are some free tools: Visme, Canva Infographic Maker, Google Charts, Piktochart, easel.ly. Some of the options here are even suitable for non-designers, as templates and other features make them easy to use.

Why is it useful for VET

Infographics offer engaging options for spicing up presentations and encourage creators to apply skills in everything from graphic design to math. These apps and websites for creating and designing infographics can help people communicate their ideas and demonstrate learning, visual and conceptual thinking while cultivating valuable design skills.

Infographics are easy to digest, fun to share and extremely engaging. By employing the tools of colourful imagery, distinctive movement, and eye-catching content, infographics help retain complex and large data easily.

How to

Visme promises to help you 'speak visually'. You can also use it to build presentations, but it's especially geared towards creating engaging infographics. This free tool includes over 100 free fonts, millions of free images and thousands of quality icons, and there's options to include video and audio (including the ability of record a voiceover directly in the editor – handy!). You can also animate your content to make things clearer.

Canva is a powerful and easy-to-use online tool that's suitable for all manner of design tasks, from brochures to presentations and much more besides. It also offers users a vast library of images, icons, fonts and features to choose from.

It features a dedicated infographic maker that you can use for free, with hundreds of free design elements and fonts at your fingertips, and many more premium elements that you can buy for up to \$1. You can either use it in the browser or download the Canva iPad app to design on the move.

Google's chart tools are powerful, simple to use, and free. You can choose from a variety of charts and configure an extensive set of options to perfectly match the look and feel of your website. By

connecting your data in real time, Google Charts is the perfect infographic generator for your website.⁴⁰

Piktochart is an infographic and presentation tool that enables you to turn boring data into engaging infographics with just a few clicks. Piktochart's custom editor lets you do things like modify colour schemes and fonts, insert pre-loaded graphics and upload basic shapes and images. Its grid-lined templates also make it easy to align graphical elements and resize images proportionally.

There's a free version offering three basic themes, a Lite pricing plan for \$15 per month or a Pro account that costs \$29 per month.

This free web-based infographic tool offers you a range of templates to start you off, all of which are easily customisable. You get access to a library of things like arrows, shapes and connector lines, and you can customise the text with different fonts, colours, text styles and sizes. The tool also lets you upload your own graphics and position them with one touch.⁴¹

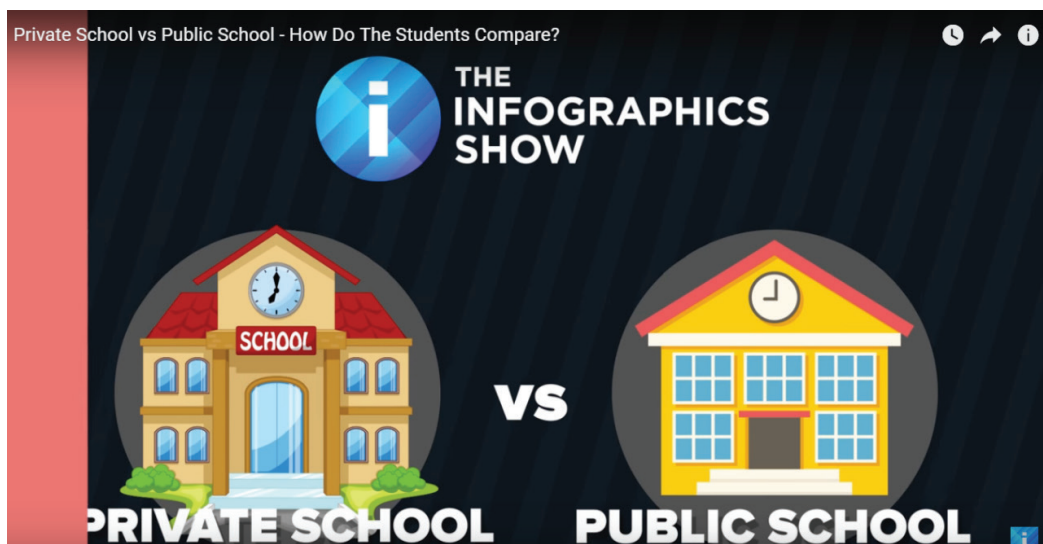
Links

- <https://sproutsocial.com/insights/free-image-creation-tools/>
- <https://www.socialmediaexaminer.com/create-graphics-for-social-media/>
- <https://www.theedublogger.com/2014/07/16/our-3-favorite-free-online-image-editors-for-education/>
- <https://www.easel.ly/>

Example

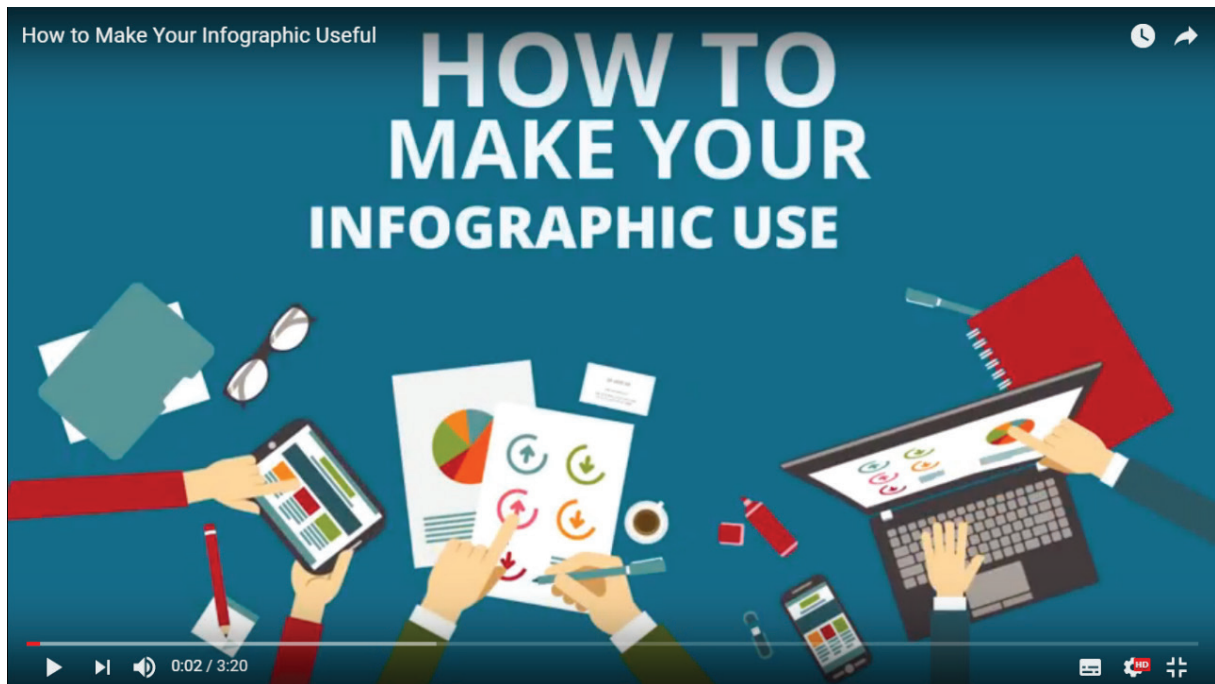
- Private School vs Public School - How Do The Students Compare?

What's the difference between a private school and a public school? Which kids are more successful? Who will go on to make more money in life? Let's find out in this episode of The Infographics Show: Private School vs Public School.



40 https://www.huffingtonpost.com/randy-krum/5-great-online-tools-for-_b_5964874.html?guccounter=1
41 <https://www.creativebloq.com/infographic/tools-2131971>

- How to Make Your Infographic Useful: advices and tips from [Easel.ly team](#)



5.12 Image creation or editing

Learning how to use image editing software can be difficult and time consuming. So, there are several free, online alternatives that are easy to use and allows novice users to quickly become comfortable editing digital images.

Canva

What is it

Canva is a free graphic-design tool website, founded in 2012. It uses a drag-and-drop format and provides access to over a million photographs, graphics, and fonts. It is used by non-designers as well as professionals. The tools can be used for both web and print media design and graphic ⁴²

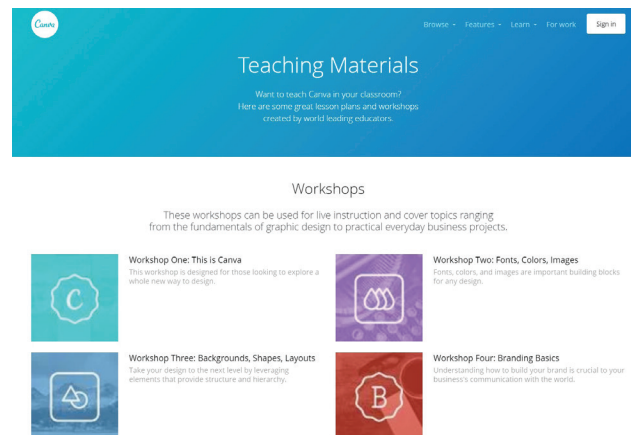
There are so many different design templates that make it easy for users to create images, build resumes or design book covers. Canva also has social media templates, making it easy to create social media images, including: cover photos, profile pictures, posts and advertisements.

How to

Users create an account (with an email address or by linking their Google or Facebook account) and then follow a tutorial, which orients them on how to get started and how to use the tool's many features. Users can upload their own images and create their own layouts or choose from a selection of thousands of built-in images and design templates (some of which are available for in-app purchase).

Features abound: You can adjust brightness and contrast, resize images, overlay images with text and colours, and more. Once users have finished creating, their designs are automatically saved to the cloud (so it requires an internet connection) and are accessible from the user's home page in the app or on the website. Users can then export their creations via email, as Facebook posts, or via Twitter, and they can download their images in JPEG, PNG, or PDF format.

How to Use Canva: [An 8-Step Guide to Creating Visual Content](#)



42 <https://en.wikipedia.org/wiki/Canva>

Why is it useful for VET

Good and attractive presentations make students to be more focused, so it is useful to know how to manage Canva. Use these design tools to bring extra verve to your course documents, class website, or social media presence. There are great graph templates built in, too, which could be great tools to help math and science classes display data; plus, students could use chart templates like the Venn diagram tool to help illustrate what they've learned in class. Check out [Canva's teaching materials](#) for more inspiration

Links

- <https://about.canva.com/>
- <https://www.pinterest.com/canva/>
- <https://www.canva.com/features/>

Pixlr

What is it

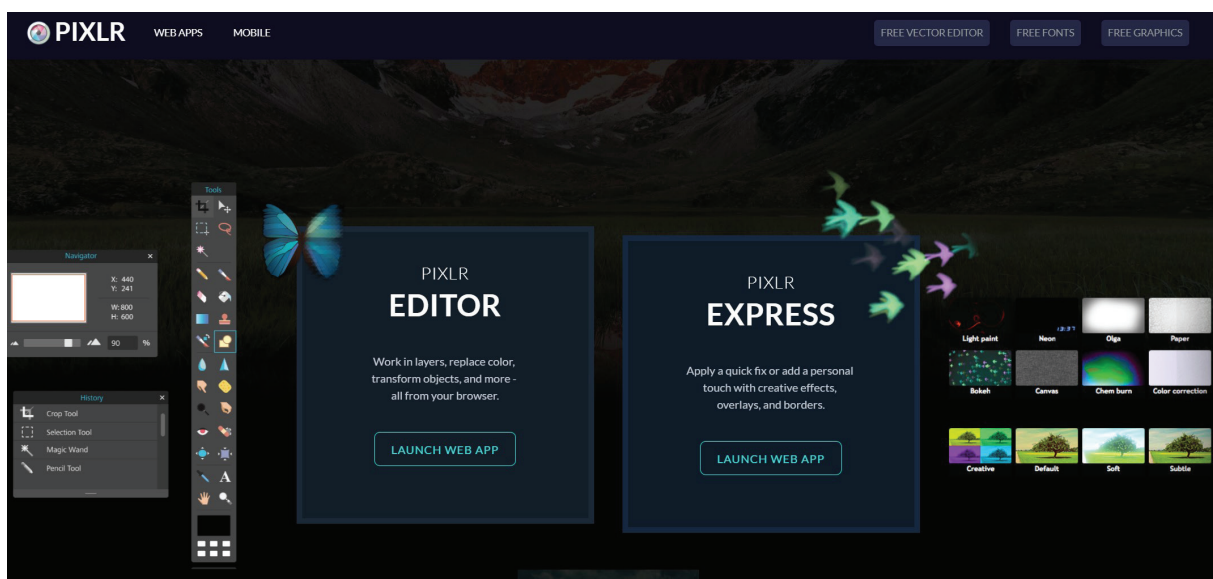
Pixlr is the image editor for everyone. Pixlr Editor is a browser photo editor for all your editing needs. Have full control over your images, including layers and effects

Their site provides 3 different levels of editing that allow you to make the process as simple or as involved as you want it to be.

Pixlr O-Matic is a very simple editor that is very similar to Instagram. Choose your picture, or take a picture using your webcam. Then use a pre-set selection of filters, borders and overlays to customize your image.

Pixlr Express is the next step up. It allows you to pull in an image from your computer, from a URL, or to take one with your webcam. It also allows you to create a collage. The collage mode only allows you to upload pictures from your computer though.

While Express does provide more editing options than Pixlr O-Matic, the editing menu is very simple and the options are limited enough not to become overwhelming. It provides a full selec-



tion of adjustment, overlay, border, text, sticker and effects tools while keeping the interface very user-friendly.

Pixlr Editor is Pixlr's most comprehensive image editor. The interaction in this editor is very comparable to Photoshop, and it is definitely for more advanced users. If you're looking for a free Photoshop alternative, this is great, but not recommended for the casual user.⁴³

How to

- No account necessary. Create an account for free storage space if you prefer.
- Nothing special to download or install. Just fire it up in your browser when you need it.
- Provides tools like layers, lasso tool, brush controls, cloning, and filters.
- Optional private Pixlr Library where you can store all your photos and images.
- Tools include red-eye reduction, a spot healing tool, drawing tools, clone tools, sharpen, blur, and many more.
- Filters include mimic HDR, glamour glow, tilt-shift, Gaussian blur, vignetting, noise, and many others.
- Adjustments include advanced concepts like Levels, Curves, Cross Process, Desaturate, Auto Levels, Hue/Saturation and Brightness/Contrast.

[How to use the Pixlr Online Image editor](#) teaches you how to navigate and use the options in the Pixlr online image editor in order to make changes to an image or photo.

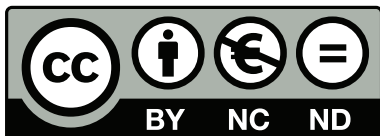
Why is it useful for VET

Because with this tool you can edit your own photos for presentations, publications, and create motivational posters even if you are not experienced with photo editing.

Links

- <https://pixlr.com/>
- <https://www.youtube.com/watch?v=y28QW05xtl8>
- <https://pixlrforteachers.wordpress.com/how-to-use-pixlr-in-the-classroom/>
- <https://books.google.ro/>

43 <https://www.theedublogger.com/2014/07/16/our-3-favorite-free-online-image-editors-for-education/>



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