

StudES Roadmap for the Enhancement of Digital Readiness in Higher Education

Authors:

Paula Al- Hmiedat
Katarzyna Biegaj
Magdalena Pisula
AGH University of Science and Technology, Center of e-Learning
Poland

Contributors:

Agnieszka Chrzęszcz, Wojciech Baran (AGH, Poland), Milan Stančić,
Vladan Devedžić (University of Belgrade, Serbia), Bojan Rosi, Marjan
Sternad (University of Maribor, Slovenia)

Disclaimer:

„The European Commission’s support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.”

StudES Roadmap for the Enhancement of Digital Readiness in Higher Education

Index

1	Preamble	2
2	Methodology	4
3	Conclusions from the research	5
4	Recomendations in a nutshell	7
5	Recomendations explained	9
6	Final remarks	54
7	Appendix	55
8	References	63

1. Preamble

E-learning has been present in education for long before the Covid-19 outbreak, but since the pandemic, it has been receiving growing attention due to the global, abrupt switch to remote learning. Teachers, as well as students, had to upskill rapidly to adapt to changing environments. For many, it has been quite unsettling (Klimowicz, 2020). Teachers had to bring their teaching designed for a traditional classroom setting into online mode and design relevant materials and activities in a very short period of time, often without proper training and knowledge about the e-learning methodology. It resulted in overload and fatigue, as well as incompatibility of teaching forms to online learning. Students forced into the emergency remote education also suffered from tiredness, solitude and superabundance of work, as reported in StudES survey. Apart from the negative side, the unexpected switch to online mode brought about increased interest and motivation to explore the methodology and research behind the e-learning forms. Digital education came out to be more diverse, accessible, flexible and personalized than traditional teaching methods. It conducted to increased students' attendance and new opportunities to invite guests and teachers from all over the world and automate a part of work. The potential of the digital learning environment (DLE) has been recognized by all participants, which created an urgent need to equip educators and institutions with the necessary knowledge, skills and tools to build on the experience gained during pandemics and transform the traditional teaching and learning into digitally enhanced one.

Teachers need guidance to provide meaningful learning experiences and create a stimulating learning environment, and design innovative educational resources and adopt new pedagogical approaches which will support student engagement and success.

The project “**StudES: Effective teaching for student engagement & success in a digital learning environment**” is an example of an international collaboration focused on considering the potential of digital technologies in higher education teaching and



learning, from an educator's perspective.

The project aims at reinforcing the process of transforming the current learning environment into more effective and positive for both academic teachers and students.

StudES project co-financed by Erasmus Plus tasked Working Group 1 with the development of a roadmap for building a stimulating learning environment in the form of recommendations to be adopted by all higher education institutions eager to enhance the quality of teaching and learning in the digital era. The recommendations are expected to define shared values and principles for Distance Learning in Higher Education, and identify concrete measures on teaching and learning in a digital environment, with proposals to reinforce building the communication and interactions between teacher and students as well as between students themselves.

As far as the other intellectual outputs are concerned, the roadmap developed will provide the insight and support necessary for the development of specific teachers training and quality standards and guidelines for effective teaching and learning in a digital environment. It will be used within the project as a benchmark for planning further activities, but will also impact the long-term strategic planning at the participating institutions and have high potential to be adopted also by other HEIs across Europe.

2. Methodology

In the work on the roadmap, two types of research methods were used: desk research and survey, which gave the context of teaching and learning in an online environment. The aim of desk research was to learn how university teachers and students perceive teaching in a digital environment, what their experience is, and what kind of difficulties they have in this field. The data came in particular from Poland, Slovenia and Serbia, as well as the analysis and recommendations published by European Union such as:

- [Report: “The impact of COVID-19 on higher education: a review of emerging evidence”](#)
- [European Framework for the Digital Competence of Educators, DigCompEdu](#)
- [UNESCO ICT Competency Framework for Teachers](#)
- [Communication from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a renewed EU agenda for higher education](#)

The survey was the technique of the research, which was chosen to collect quantitative data. Respondents had access to the questionnaire from the 6th to the 25th of May 2021. The survey was conducted in 3 countries: Poland, Serbia and Slovenia among university teachers who taught in an online environment during the pandemic Covid-19. 511 responses were collected (Poland - 229, Serbia - 170, Slovenia - 112). The survey attempted to find answers to the following questions:

- How do university teachers teach in a digital environment?
- What kind of difficulties do university teachers face?
- How do university teachers assess their skills connected with teaching online?

3. Conclusions from the research

EMERGENCY PEDAGOGY: Report of European Commission [„The impact of COVID-19 on higher education: a review of emerging evidence”](#) shows a phenomenon called „emergency remote learning”. During the pandemic of coronavirus, teachers adapted their traditional way of teaching and materials to an online version, but they didn’t change the curriculum or the methodology. This is also reflected in teachers’ choice of forms of teaching online. According to a European Commission report: three out of four educators used live-streamed lectures for teaching in a digital environment during the pandemic. The survey conducted in Poland, Serbia and Slovenia showed that it was also the most represented form.

Almost half of the university teachers were sending presentations (44%) and one third was sharing with students recorded lectures during online courses – the report of the European Commission is alarming. Analogous data was gained in the survey conducted in Poland, Serbia and Slovenia, a number of respondents used more passive methods e.g. 45% of teachers didn’t organize work in pairs/groups or did that rarely, one in five didn’t (or did very rarely) initialize discussion in spoken or written form.

QUALITY OF TEACHING: Educators adapted to new circumstances in their own way and after months of teaching online most of them (91%) believed they handle it well or really well. These results aren’t startling, yet the more important question is about the quality of teaching in digital environments and whether teachers used methods adequate for e-learning.

Every second teacher considers teaching online to be of lower quality in comparison to the traditional one. A similar opinion is shared by a number of students. Desk research shows that four out of ten Polish university learners perceive learning in a digital environment as worse than in the traditional way. Serbian students graded the learning quality in a digital environment with 3 (average grade on the scale of 1-5).

DIFFICULTIES: After months with online teaching, still one in five respondents consider teaching online as difficult for them. Two difficulties were specially mentioned: **lack of direct contact with students** and **activating learners**. Especially when students’ cameras are turned off, educators can not see a lot of non-verbal reactions, there were fewer interactions and learners were more passive listeners.

- „It was troublesome for me that I couldn't see students because from their body language I can see if they are able to follow and understand or not.”
- „Online environment is unnatural, lack of or difficulties with contact with students.”
- „Professor-student contact, ensuring a level playing field for all students, discussions and communication.”
- „The most difficult part of online teaching is in motivating students to actively take part in discussions, ask questions and carefully follow the lecture.”
- „Students don't take this kind of teaching seriously and are not taking part in the activities enough, which reflect on the quality of teaching and their learning results.”

It is critical to create a community around the online course, but it's the skill that respondents assess only on 3,4 on the scale of 1-5. Motivating students is another problematic area (average grade – 3,6). On the other hand, teachers feel quite good at using an LMS platform for online teaching, sending explicit and precise messages and organizing their own work.

SUPPORTING DIGITAL COMPETENCES: In the online environment, the digital competencies of educators play a major role. Special attention should be paid especially to two of them: developing students' digital competence and creating and modifying digital resources. One-third of teachers who took part in the survey couldn't fully agree that their courses indirectly support the development of students' digital competencies. Every second respondent doesn't feel confident in modifying open licence digital sources and creating materials adequate for their courses. According to the DigCompEdu framework, it's important to improve educators' competencies in these areas and make them aware of all benefits in both fields.

BLENDED MODE: On the other hand, university teachers appreciate some elements of e-learning and would like to complement traditional courses with them. This data confirms that skills connected with teaching online will be needed also after the pandemic, which indicates the need to support them.

4. Recommendations in a nutshell

Remote teaching and learning during the Covid-19 crisis are often referred to as Emergency Remote Teaching. This is to differentiate between e-learning, which is based on the research and certain methodology, and emergency online teaching performed as a response to the lockdown caused by the pandemics. The experience gained by teachers during this period opened the door for exploring e-learning methodology and practice, which are significant to assure meaningful and quality education. Recommendations below include insights from e-learning methodologies and models that best address the most occurring problems with online education during the Covid-19 crisis mentioned by teachers and students in the StudES survey and desk research.

The problem of subject-specific teaching

According to Beetham and Shape (2007), professional education is usually narrow, practice-based and subjected to the influence from the communities of practice and external requirements. For students, it means not only acquiring professional knowledge and skills but also becoming practitioners, which means developing competencies that will allow them to bring their expertise into the communities of practice. Technical knowledge and skills are always accompanied by certain professional behaviour and ethics, team-working and other transversal skills characteristic for a particular profession. Therefore, professional education should consist of both: developing skills and knowledge and applying them in the context of practice. There are several methods and ideas that could be adapted by educators to reinforce the development of both: skills and knowledge and contextual practice. In the following document, there are several propositions of implementing this concept in an online environment.

- Design the course using models supporting students' engagement
- Use interactive lessons and simulators to teach practical skills
- Implement cooperative learning
- Balance synchronous and asynchronous learning

- Align students needs, activities and learning outcomes
- Align assessment
- Align the development of students' competencies

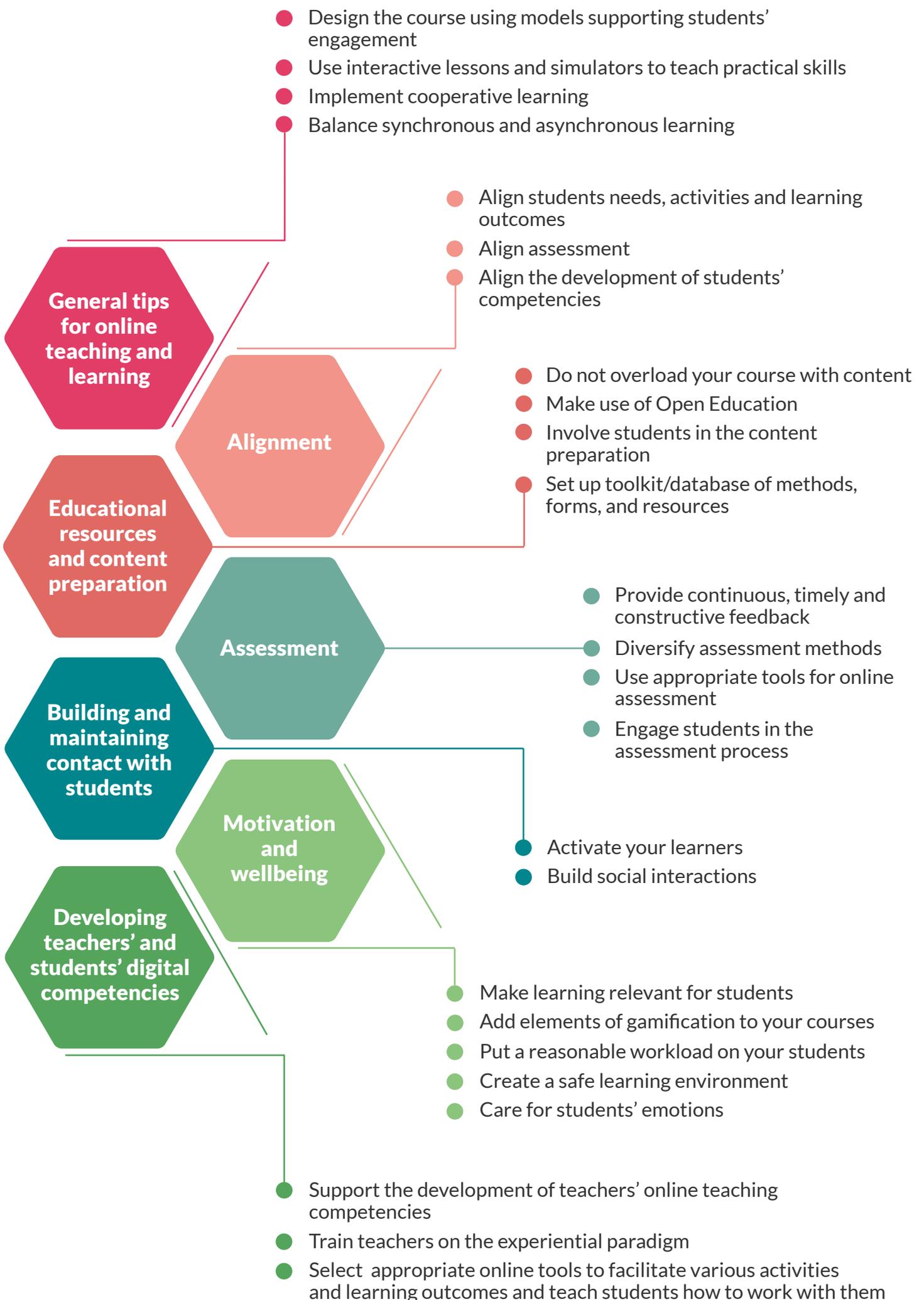
- Do not overload your course with content
- Make use of Open Education
- Involve students in the content preparation
- Set up toolkit/database of methods, forms, and resources

- Provide continuous, timely and constructive feedback
- Diversify assessment methods
- Use appropriate tools for online assessment
- Engage students in the assessment process

- Activate your learners
- Build social interactions

- Make learning relevant for students
- Add elements of gamification to your courses
- Put a reasonable workload on your students
- Create a safe learning environment
- Care for students' emotions

- Support the development of teachers' online teaching competencies
- Train teachers on the experiential paradigm
- Select appropriate online tools to facilitate various activities and learning outcomes and teach students how to work with them



5. Recommendations explained

General tips for online teaching and learning

● Design the course using models supporting students' engagement

Below, listed are teaching approaches that connect knowledge to its application. Employing one of these approaches could result in having students learn through working on a project that stimulates and simplifies practice, or work on real-life projects under close supervision. This way, students are given the opportunity to deepen their understanding of the subject and practice their skills.

They work on their competencies in a complex way. These forms positively influence students' involvement, nourishing their academic attitudes and independence:

● Project-based learning

Project-based learning is a teaching approach that engages students in different learning activities that finally result in a particular project, such as a realistic, tangible product, an event, or a presentation. (Dumont and Benavides, 2010)

The main benefits of the project-based approach:

- increased confidence in learning
- development of students' critical thinking, problem-solving and analytical skills
- development of social participation behaviour (Dumont and Benavides, 2010)

● Inquiry-based learning

Inquiry-based learning (IBL) is a learner-centred approach that encourages students to learn through the exploration of various resources such as e.g. books, pictures, videos, data banks but also places such as museums, exhibitions or historical sites (Laurillard, D. 2012). In inquiry-based learning, students take responsibility for their own learning and "learn how to use existing texts and materials for their own intellectual inquiry, coming to a more contextualized understanding, and making it their own, not content with the

mere acquisition of someone else's ideas (Laurillard, D. 2012).” Laurillard (2012) stresses the importance of teacher's guidance in IBL, which she describes as planned support “the teacher designs in to ensure that learners spend their time productively” by modelling “skills of inquiry, investigation, interpretation, integration, analysis, critique, evaluation, resolution, synthesis, and representation of a problem or issue”.

- Problem-based learning (PBL)

PBL is an approach in which at the very beginning of the learning process, students are confronted with a problem and their task is to work together to define and finally solve it. The main advantage of the PBL method is that it encourages students' curiosity and engagement, and thus leads to meaningful learning (Conrad and Donaldson, 2011).

- Games-based learning

Read more: [Games-based learning vs. gamification](#)

- Blended learning (for example flipped classroom)

Blended learning in its various forms allows learners to study in both environments: online and in a traditional classroom. The variety of channels through which students learn helps them better understand and practice a particular topic.

Read more: [Flipped pedagogy](#)

- Inviting guests

A digital environment makes it possible to invite guests and experts from different fields that would not be able to attend physical lectures. The presence of outside guests could positively influence students' motivation and make their learning process more relevant.

- Case studies
- Cognitive apprenticeship

A theory within the constructivist approaches to human learning in which students learn certain skills, knowledge and attitudes from subject-matter experts within 6 teaching methods: modelling, coaching, scaffolding, articulation, reflection, exploration. This theory focuses on a complex process in which an apprentice is learning a skill from a subject-matter expert within a certain context, rather than on a physical presence and interaction.



**General tips
for online
teaching and
learning**

- **Use interactive lessons and simulators to teach practical skills**

According to Beetham & Sharpe (2007), the use of virtual simulators has been proven highly effective for professions such as medical practitioners, architects, engineers, pilots. Real-life context simulators encourage students' critical thinking, decision-making, improvising, and applying theoretical knowledge and skills. Evidently, these kinds of simulators and virtual reality require much preparation and funds on an institutional level.

Less demanding, but highly effective, types of simpler simulations are those created in authoring tools, later referred to as interactive lessons. Students immerse themselves in real situations and develop similar skills to 3D simulators, except the manual practice (Beetham & Sharpe, 2007). A fitting example of such a lesson is a British series of interactive educational videos called [Lifesaver](#). Authoring tools, as well as simple LMS plugins, such as Lesson Activity in Moodle or various templates in the H5P plugin (compatible with LMS platforms and as a stand-alone tool), enable educators to create branching scenarios, role-plays and negotiations resembling those from real life. They require a significant effort of preparation but are highly engaging and effective.

Even though virtual simulators and interactive lessons could provide students with opportunities to practice their professional skills, in many cases real-life in-person practical training is necessary for students to gain confidence and master the skills, and for teachers to properly assess students skills and performance.

Example of virtual simulator: PhET: <https://phet.colorado.edu/>



**General tips
for online
teaching and
learning**

● **Implement cooperative learning**

Implementing elements of cooperative learning has been proven to nourish and enhance skills and values such as cooperation, teamwork, acceptance of differences, reasoning, communication, and engaging higher levels of thinking and interacting with the knowledge (Bellanca et al., 2010). While collaborating, students see how others work and understand the knowledge, and through that observation, they deepen their own understanding.

For the group work to be effective, students need to share the same goal and be subject to individual accountability. The role of a teacher in group activities is important, as he/she needs to plan and organize the lesson and activities, design and arrange the collaboration, support, and motivate students, facilitate and supervise the learning process and its outcomes and ensure the right evaluation (Laurillard, 2021).

Examples of cooperative learning methods:

- STL (Student Team Learning) - in this approach the focus of the group is not on the product of the group collaboration but on the learning that takes place during the group process. Students are rewarded or get certificates if the group's performance is above pre-established standards. Peers teach each other so that during individual quizzes, each member scores high. The group's success is an average of each individual score.

Students have equal opportunity for success, one of the components of group evaluation is the individual progress of each member over past performance.

- STAD (Student Teams – Achievement Divisions) is a method that evolved from STL. Students work in groups of four. After the teacher’s presentation of a new concept/topic, students work together to get familiar with the material and practice skills. After a certain time, they all take individual quizzes. The score is based on the comparison to the past performances, points are awarded when the student meets or exceeds the past average and then summed up to a group score.
- TGT (Teams-Games-Tournament) is a modification of STAD method. The concept of the lesson/module is the same: the teacher presents the material, students rehearse and peer-learn, but instead of individual quizzes they participate in group tournaments, where they compete against other teams (on an individual basis) and score points (Bellanca et al., 2010).
- [Jigsaw](#) – students work in groups of six (though it could also be adapted for smaller or bigger groups). The material is divided into six chunks and distributed among the groups. During the first session, students learn together the given chunk of the material, practice, analyse, and explain it to each other. The teacher can design certain tasks, activities, and instructions to facilitate and enhance the learning process. This stage is sometimes called expert groups. In the second phase, students regroup so that in each new group, there is only one member from the old groups. In new groups, students teach each other their chunks. Again, the teacher can facilitate this stage with instructions to make the process meaningful and efficient. There are various modifications to this method, and enhancements with elements of other methods, for example, STAD (students then are individually tested, and their score contributes to the group’s overall performance) (Bellanca et al., 2010).
- Learning together – this is the simplest and most common organization of group work that advocates team building and the occurrence of natural group dynamics. Students

are paired or grouped and work together on a certain task. There are various modifications to this method, such as Group Investigation, where learners group themselves and prepare together a part of the topic, with activities and presentation and then communicate it to the other groups (Bellanca et al., 2010). Another variation would be buzz groups, where students are given a problem or topic to discuss freely, brainstorm or build mind maps (Biggs & Tang, 2011).

- Problem-solving groups/Oxford debates – various discussion and debate methods constitute a different category of group activities. In problem-solving groups or Oxford Debates, students collaborate on solutions/arguments and then defend them against other groups.
- Reciprocal teaching – students work in groups or pairs and take turns to ask generic questions about the topic of the class/module. By doing so, students repeat, rehearse, and consolidate the knowledge (Biggs & Tang, 2011). Often while reciprocal teaching, team members are assigned roles they are responsible for to ensure the learning process. For example, one student generates questions, another person takes care of clarifying difficult terms etc. (Frey et al., 2009).

How to implement cooperative learning online?

Clark and Mayer (2016) enumerated several ideas that facilitate collaborative learning:

- Blogs/miniblogs - students can work on blog posts individually or in dyads/groups. They can visit each other's blogs and comment on the content.
- Breakout Rooms – used in synchronous videoconferencing and webinars / online seminars, allows grouping students into separate rooms for collaborative activities.
- Chats – a simple communication tool for two or more participants.

- Forum – usually an asynchronous tool that allows a larger group to post comments and reply to each other, creating chains. Different platforms and LMS offer additional features of the forum, such as grading, disabling seeing posts of others before posting, multiple and/or single threads etc.

Read more on using [Forum for Assessment](#).

- Wiki - an activity tool inspired by Wikipedia. The whole team works on several aspects of a topic, each member is responsible for one entry.
- Workshop and collaboration apps – usually in a form of interactive, multifunction board (such as Miro, Mural, Padlet, Jumbboard etc.) that allows several users to modify it at the same time by adding and arranging post-its, blocks of texts, columns, tables, shapes etc.



**General tips
for online
teaching and
learning**

- **Balance synchronous and asynchronous learning**

Online education should consist of both: synchronous and asynchronous forms. Asynchronous forms allow the user to access the course at their own pace and time. That means, they can spend a certain amount of time in front of the computer, then take a break for some analogue or physical activity and come back to study. This way their brains and cognitive minds are not overloaded and overwhelmed, their sight does not deteriorate, their focus is restored.

On the other hand, synchronous learning allows for building contact and interactions in real-time. There are advantages and disadvantages of each approach, as shown in the examples below. The key is to align the teaching mode to achieve desired learning outcomes.

Advantages and Disadvantages of Asynchronous and Synchronous Learning

Asynchronous:

Advantages	Disadvantages
<p>Accessibility: students choose when and where they want to study. If they do not possess an appropriate device or internet connection, they can go to the local library. If they have to juggle working and studying at the same time, they have a chance to study in their own time. It also gives better opportunities for students from abroad to study in their own time zone.</p>	<p>Deferred feedback: students' questions and misunderstandings cannot be addressed immediately, the feedback is deferred.</p>
<p>Availability: all learning materials and activities are available at all times. Students have a chance to come back and repeat the lesson as many times as they need.</p>	<p>Real-time interactions: asynchronous mode does not allow for real-time interactions, which means no group and class dynamics are taking place.</p>
<p>No distractions: Students work at their own pace. The fast-finishers do not need to wait for the group to finish, and those who need more time to understand and complete a task do not worry to finish on time. Also, the class dynamics, such as time wasted on group allocation, interrupting questions do not occur.</p>	<p>Solitude: even though there are plenty of collaboration and cooperation activities in asynchronous learning, each student works on their own without the physical presence of the group.</p>
<p>Time-saving: Material prepared once before the course can be re-used numerous times, which saves time throughout the course for other activities such as personalized feedback or tutoring.</p>	<p>Discipline: students need to take responsibility for their studying and discipline themselves to allocate time for learning and completing tasks, as there is no direct monitoring.</p>

Advantages	Disadvantages
<p>Group interactions and discussions: collaboration activities and discussions can easily be designed in asynchronous mode. Another advantage is that students have time to prepare and think their answers or comments through before posting them to the discussion.</p>	<p>Individual work: students' work can only be monitored to some extent. There is a chance that students do not complete their tasks on their own, and use aid from their peers or from the web.</p>
<p>Number of learners: asynchronous mode allows for a greater number of participants to sign up for the course, as there are no limits on online platforms.</p>	
<p>In a blended approach: when both the synchronous and asynchronous modes are used in a course, the synchronous time can be used for practice and collaboration.</p>	
<p>Wellbeing: due to more flexibility of asynchronous mode, learners do not need to sit in front of the screen for long hours, trying to maintain their focus. They can take breaks whenever they need and perform some tasks outside the computer, in the more traditional way, and only submit it online.</p>	

Synchronous:

Advantages	Disadvantages
<p>Real-time interactions: synchronous meetings facilitate real-time interactions, such as spontaneous discussions, questions answered on the spot, further explanations etc.</p>	<p>Availability: teachers and students need to adjust their schedules to attend lectures at a certain time.</p>
<p>Monitoring students' attendance and participation: teacher can, to some extent allowed by the technology of choice, monitor students involved in learning activities.</p>	<p>Quality: synchronous lectures can easily become teacher-centred and therefore, the quality of teaching will solely depend on a particular tutor.</p>
<p>Non-verbal communication: a teacher can observe students reactions to their questions and activities (to some extent allowed by the technology of choice). Teachers also can receive non-verbal feedback of understanding of the instructions or the subject, and observe the level of energy and interest.</p>	<p>Limited time: time of synchronous lessons is limited. If there are several students that require the teacher's assistance, they might not receive it due to lack of time.</p>
	<p>Tiredness: long hours spent in front of the screen are more tiring than in the traditional classroom. During synchronous meetings, students can't take a break to rest their sight, as they would miss on the presented material.</p>
	<p>Accessibility: Students and teachers need to rely fully on the Internet connection. If the connection is lost, students miss parts of the lesson. Moreover, they need to possess a device and Internet connection at a certain time, which might be costly and not always attainable.</p>

It is recommended to use both: synchronous and asynchronous lessons, and align them with learning objectives and groups' needs.

There are different models of asynchronous and synchronous learning design that could be employed in course creation. For asynchronous mode, the recommended methods are:

- [e-tivities](#) by Gilly Salmon - canvas for designing short asynchronous activities that consist of individual and group work
- [5-stages model](#) of asynchronous online courses by Gilly Salmon

For synchronous learning design:

- [4-stages webinar design](#)

Alignment

● Align students' needs, activities and learning outcomes

Learning objectives should be worded clearly so that the teacher can easily select the indicators of progress or achievement of a certain objective, and an activity that will lead students to achieve that objective. Helpful to the process of creating learning objectives is Bloom's Taxonomy.

The Taxonomy of Educational Objectives proposed by Bloom is a scheme that classifies learning objectives into several categories based on their cognitive complexity and level of abstraction: Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation.

Read more: [Bloom's Taxonomy](#)

It is recommended to choose methods, tools and forms that best support attaining learning outcomes. For knowledge-based learning outcomes, a teacher can choose from a variety of forms, both: synchronous, such as videoconferencing lectures, and asynchronous, such as interactive lessons, quizzes and tasks. For skills-based learning goals, the activities and forms would engage more group work, practical tasks, simulators, projects etc. Attitude-based learning outcomes could be executed using discussions, reflection activities.

Other factors that should be considered when aligning activities to learning outcomes are local context and learners' needs. For instance, if the local institution does not provide learners with an appropriate tool for videoconferencing, that should also be taken into account when selecting forms and activities.

Alignment

● Align assessment

To assure the coherence of a course, assessment should be given a thought at the very beginning of planning and designing and aligned with the learning objectives and course activities (Fisher, 2003). This way, a teacher has a clear vision of how they will collect the evidence of learning and progress throughout the course.

There are models and approaches that facilitate the process of aligning assessment with learning objectives and activities. One of them is [Backward Design](#).

Read more: [Assessment](#)

Alignment

● Align the development of students' competencies

According to the Bologna process, learning outcomes and course objectives should be composed not only of theoretical knowledge but also of the development of skills and nurturing of academic attitudes. This way, students possess necessary competencies and are better prepared to join communities of practice and workplaces after graduating from higher education institutions.

According to Biggs and Tang (2011, teaching competencies facilitates developing higher-order thinking skills, basic academic success skills, discipline-specific knowledge and skills, liberal arts and academic values, work and career development, personal development.

Read more in [Bloom's Taxonomy](#), [Backward Design](#)

Teaching and learning in online environments require new skills and competencies not only for teachers but also for students. Moreover, digital literacy became a requirement in the job market and in most professions, that students might want to pursue after graduating.

Also, the development of transversal skills has become a part of the educational agenda in Europe. [21st Century skills, transversal skills, key competencies, interdisciplinary skills](#) – they carry different names, but the concept is the same. Rapid changes in economy and infrastructure, all-encompassing technological growth created a demand for people who possess skills such as communication, problem-solving, critical thinking etc., who can adapt quickly to rapidly changing reality, bring new perspectives and respond to changing requirements. According to Bellanca et al., (2010) people no longer stay at one job, even in one profession, for a lifetime. They need the transversal skills to continue reinventing themselves and adjusting to the changing reality and requirements. Therefore, it is recommended to include 21st-century skills in their curriculum.

How to include these skills?

A class can be delivered in many ways. It can be a receptive lecture; it can be interactive self-paced guided discovery. Each form will engage different skills' development. When students are listening to the lecture, they develop understanding, and notes taking skills. Then when asked a sequence of questions meant to verify if they absorbed and memorized the knowledge provided, they develop memorizing, repeating (and sometimes regurgitating), and summarizing skills. But when given a problem that requires the use of knowledge, and asked to solve it in groups, we can add to the list of competencies transversal skills such as communication, team-working, critical thinking, decision-making, analysing etc. If a teacher employs an online tool to facilitate such as activity, students will also develop their digital skills.

There are several models advocating the development of competencies, such as problem-based learning, project-based learning, inquiry-based learning.

Reinforcing digital and transversal competence development in formal education is necessary. When crafting the syllabus for a subject, it is advised that the teacher adds the development of students' digital and transversal competence to their learning outcomes and consequently adapt their teaching practice and learning activities to enable students to attain these goals.

Read more: [Developing teachers' and students' competencies](#)



**Educational
resources
and content
preparation**

One of the main difficulties mentioned by the teachers in the survey was the fact that the preparation of the courses and the materials for online learning is much more demanding and takes more time than in offline courses. In a digital environment, the activities and interactions that evolve naturally and spontaneously during regular classes need to be carefully designed beforehand. What is more, asynchronous online courses have to be planned step-by-step and thoroughly described, since they very frequently leave no space for immediate teacher response.

● **Do not overload courses with content**

The Internet gives us an enormous, one might sometimes think even infinite, bank of resources. It is easy to lose our way in trying to choose an appropriate one or to adapt it to our course. It is worth remembering, that sometimes less is more.

● Minimal content design

With a vast number of accessible digital resources, there is a possible temptation to use them all to deepen students' knowledge in the subject matter. However, the effect of such an attitude is that students frequently feel overwhelmed by the course. While designing their online classes, teachers should try to align better with the learning goals and only select content that is sufficient for reaching learning outcomes.

Here, we can also reach for a concept of a Minimum Viable Product (MVP) that stems from the User Experience field but might be, quite easily, adapted to education and course design. The idea lying under this term is that product designers avoid creating a perfect product from the very beginning. Instead, they design its simplest version, which will still be satisfying for their customers. Consequently, after the release of the product, they are getting feedback, which is necessary for any future changes and improvements.

Analogically, we can use the term Minimum Viable Course, which implies that teachers should at first try to create a course that would meet all the didactic needs of their students and be pedagogically effective, while at the same time omitting anything (materials, activities etc.) which seem to be unessential when it comes to learning objectives.

- Re-use

There is one very important asset of digital teaching, mainly the fact that the courses (or their parts) might be used at least several times. In the majority of cases, they would need to be changed or adapted on the basis of previous experience, but if properly designed, such modifications can be introduced quite easily.

What is more, there might be examples of modules of an already prepared class that are applicable for several subjects, which when well-prepared, can be quickly transferred among them.

In order to be able to recycle their courses, we recommend that teachers:

- divide their courses in small chunks, focused on one narrow, specific subject, which will help them to reorganize their courses or to use these specific parts in other projects (Feldstein, 2002);
- design their courses in such a way that they all have a common structure. Recycling the whole design process makes it easier to include the same or very similar instructions/ descriptions etc. in different projects;
- collaborate with other teachers/ course designers. Consulting colleagues and asking them what worked/ or did not work in their courses is always a good idea, as this way teachers save time by using already established good practices and avoiding common mistakes.

Read more on re-using materials: <https://elearnmag.acm.org/featured.cfm?aid=566782>

Educational resources and content preparation

● Make use of Open Education

We also recommend that teachers consider using already prepared Open Educational Resources (OER), which are defined by UNESCO (2021) as “teaching, learning and research materials in any medium – digital or otherwise – that reside in the public domain or have been released under an open licence that permits no-cost access, use, adaptation and redistribution by others with no, or limited restrictions.”

In other words, the idea behind the OER is that their users should be able to engage in 5R activities related to the resource (Wiley), such as retaining (keeping it), revising (adapting, modifying), remixing (combining it with other resources), reusing (using the resource publicly) and redistributing (sharing).

Open Educational Resources are most frequently published under Creative Commons licence, which allows the author to retain his copyright laws and at the same time define what the user can do with his/her work.

The use of OER will not only save teachers’ time, which is normally spent on content preparation but can also finally contribute to the development of good quality educational resources that might be used and modified worldwide.

Educational resources and content preparation

● Involve students in the content preparation

Involving students in some independent learning and content preparation is a very efficient pedagogical procedure. It is also a good way for teachers to save time while designing their courses.

Consequently, we recommend that teachers design courses/ activities where students take over some responsibility for their own learning and if relevant find the didactic resources on their own. To ensure that materials found are of good quality, students might collaboratively assess their validity or work on them.

We suggest two pedagogical approaches that might be helpful in passing more responsibility to students for their learning process.

- Experience-based teaching

The most important assumption of the EBL approach is that people naturally learn through their own personal experiences. It is more participative, learner-centred and requires activities that are meaningful for students. It is frequently juxtaposed with more traditional methods where the whole teaching and learning process is teacher-driven and focused on one way, teacher-student knowledge transmission (Andresen et al. 1995). As Andresen et al. point out, “EBL often assumes relatively equal relationships between facilitator and learner, involves the possibility of negotiation, and gives the learner considerable control and autonomy”. The role of the teacher who favours such an approach is to support learners and their learning process, rather than to be a typical mentor.

EBL approach apart from promoting students autonomy, advocates various activities that require involvement from the students’ side, such as e.g. “active learning in lectures, computer simulations, use of realistic models, video-based activities, group discussions and syndicate methods, autobiographical writing, problem-based learning, group work, use of reflective journals and self-directed projects.” (Andresen et al. 1995)

A similar approach has been proposed by David Kolb.

For more read: [Experiential Learning Cycle](#)

- Flipped pedagogy

A flipped classroom is another approach that also shifts some responsibility for learning to students. The most important assumption of this pedagogical model is to allow students to study the materials at home, before the class, and to let them participate in activities that resemble homework in the classroom, with the support of the educators (Hanaa and Khadri, 2016). In practice, students are given content / materials prior to the face to face meeting and the class itself is a time for practice and clarification with a teacher and/or other students. The meeting is then followed by activities which “are clearly connected to pre-class and face-to-face class learning experiences and address ‘capabilities that count,’ making the students’ learning relevant, real and sustainable.” (The Flipped Classroom Explained | Flipped Learning in Adelaide, 2018)

For more read: [Flipped Learning Network Hub](#)



**Educational
resources
and content
preparation**

- **Set up toolkit/database of methods, forms, and resources**

It is highly recommended setting up an institutional space for knowledge sharing, good practices exchange and inspiration. It could be a part of an institutional website, LMS or other accessible online tools where teachers can look for support and inspiration for their courses.

Likewise, it could involve tutorials on processes effective in a particular institution, methods and forms that best work in online education, open educational resources, and resources created by educators from the institution that could be used as an inspiration for other courses.

Assessment

Assessment is an integral part of any type of teaching, whether it is “face-to-face” or e-learning. It allows teachers to monitor students’ progress and provide constructive feedback. For students, it can be a great motivator, or on the other hand, an obstacle that keeps them from exploring the subject and deviates them into focusing on getting grades rather than acquiring knowledge and skills (Dumont et al., 2010).

Difficulties with online assessment were reported in both the research and the StudES survey. Teachers mostly questioned its reliability, objectivity and effectiveness, as the virtual environment conduces to cooperative work and cheating. The lack of proctoring during online exams was mentioned as one of the biggest disadvantages of digital teaching and learning. This could result from encapsulating the entire evaluation in the final exam or throughout the semester testing, as the only form of assessment. Below, there are different forms of assessment that could be used by teachers in the virtual learning environment that will help them monitor students’ progress and measure the effectiveness of activities and tasks incorporated into the course.

● Provide continuous, timely and constructive feedback

Timely, personalized feedback is a powerful tool in e-learning, as it creates a direct interaction between the teacher and the student in an environment where human interactions do not occur as naturally as in a traditional classroom. Regardless of the form of the feedback, it shows the student that the teacher is involved in their learning, it reinforces the master-student relationship and creates room for self-reflection and improvement.

There are various models of feedback tied to different purposes. Nonetheless, research indicates, that whenever personalized feedback accompanies teaching and learning, students tend to demonstrate better motivation and outcomes than when assessed by grades (Fisher, 2003)

Valuable feedback should always refer to the concept students were exposed to during the course. According to Fred Lockwood (1998), even more, important than the quality of feedback is its timing. If the evaluation is delivered immediately after the performance, then there is a greater chance students will reflect on their knowledge and skills, look for gaps/weaknesses and build on their strengths. If the assessment is deferred, for instance to the end of term, then students will be less able to excavate an already shaped chunk of knowledge, reflect on it and reshape it. Additionally, if the feedback is given to more than one unit/module/chunk, such as summative feedback at the end of course, then there is a very plausible danger that students had already learnt certain issues incorrectly or created gaps in their knowledge on which they kept on building new topics and chunks throughout the semester, reinforcing and consolidating misunderstandings.

The online environment simplified and opened new possibilities for providing timely feedback to students. LMS platforms and various online tools usually have an option to set up grading criteria and automated grading that gives students feedback immediately after the submission of the task/quiz.

For the feedback to become formative to a student's learning, there must be a culture of welcoming mistakes and errors created beforehand. Students need to feel free to try, experiment and fail, make mistakes, and correct them, learn from them. If a mistake is being punished by the grade drop, then the student will be too afraid to build new educational experiences and broaden their perceptions of the knowledge (Biggs and Tang, 2011).

Patti Shank (2017) lists three roles of feedback in education: to reinforce correct understanding, to correct misunderstandings, and to bridge the gap between the performance and the learning outcome. Shank also mentions what should be avoided, when giving feedback, and that is: praising, rewarding, punishing, threatening, setting, and adhering to trivial or unattainable goals, comparing to others, and discouraging. Instead of assessing and judging students' achievements, the feedback should guide them to perform better.

Personalized, formative feedback can be provided in a variety of ways using digital tools. Teachers can use communicators, such as MS Teams, chat or similar adapted by the

institution. Most of the LMS activities and online tools have pre-defined fields to write a comment and/or feedback for students. After the student submits the answer / assignment, the teacher can write their feedback directly under the task/test. Some of them allow recording a voice note. Another option is to arrange a short meeting via videoconferencing tools, such as Zoom, WebEx, MS Teams, etc.



● Diversify assessment methods

To understand a complex issue, one needs to explore and learn it from different perspectives, and in various ways, throughout time. It is achievable through well-planned learning outcomes and objectives (for example, according to Bloom's Taxonomy, or other relevant models). Therefore, the evaluation of the learning process should not be limited to the one-time event – a final exam, but also take place over a whole period of learning, and vary in forms (Wiggins & McTighe, 1998).

Employing a wide range of assessment forms, both: summative and formative, will give students the opportunity to demonstrate their skills and knowledge in different perspectives and performances, and thus deepen their understanding and proficiency in the studied subject.

Moreover, skills and knowledge applied in the real world never happen through multiple-choice quizzes, as in educational environments. It is highly recommended to build assessment on authentic examples, case studies, create realistic situations to prepare students to cope with the challenges they will face after graduation – at work, as young professionals. Such an approach will shift their focus from “scoring good grades” into solving problems, reasoning, communicating, planning while interacting with the subject (Fisher, 2003).

Summative assessment is typically used to evaluate students' overall competence scope gained throughout the course. It could take the form of a final exam, which is the most popular choice among teachers, or final projects, assignments (Fisher, 2003).

Often these procedures are established by the institution.

Formative assessment is performed during the learning process, continuously. It serves as a map of students' progress and helps scaffold the content of the course so that students can build the knowledge and skills gradually, receiving feedback on their performance and understanding throughout the way. It invites students to communicate their learning often, and therefore, it trains them on self-reflection. Furthermore, it prevents them from moving on from the chunk of the material they did not fully understand and deepens the gap in their knowledge. For teachers, on the other hand, it draws a landscape of their entire course allowing them to revise and apply ad hoc changes, if necessary (Fisher, 2003).

The examples of online formative assessment:

- Blogs/journal entries

In a virtual environment, these could be kept on an institutional drive, within LMS or with the use of external online tools. These forms of continuous evidence of learning collection allow students to reflect on their learning and discuss the progress with the teacher:

- E-portfolio
- Unit-module quizzes
- Projects
- Discussions
- Homework (e.g. self-learning materials, interactive lessons, off-line assignments to be recorded and uploaded online, presentations, recordings, and quizzes etc.)

Read more in: [Use appropriate tools for online assessment](#)

- Teacher-student observations

It could be conducted via monitoring tools embedded in most LMS, and synchronous observations. Usually, teacher-student observations end with an individual feedback session where both teacher and student share reflections on the student's learning process and plan for further development.

- Interactive lessons

Created on institutional LMS or authoring tools (such as Adobe Captivate, Articulate Storyline and Articulate Rise, ActivePresenter) interactive lessons allow students to learn a chunk of material and answer the question/perform a task before moving on to the next part. This way, the student reflects on the material learnt and receives feedback that consolidates the knowledge. Then they can build on it by moving on to the next chunk. Tools for creating interactive lessons usually allow for creating branching scenarios, which are a powerful and gamified way to practice new material in different contexts, anchoring it to real-life situations and case studies. Such exercises are engaging to students as they usually use elements of storytelling and gaming. The student engages in a story/situation and makes decisions leading to a certain result.

- Interactive presentations

Recommended especially during synchronous online sessions (via videoconferencing / webinar tools) interactive presentations allow students to watch the teacher's presentation on their own device and participate in activities set on the slides: answer questions, draw, drag and drop, choose, categorize and more. This way the teacher continuously receives information about students' understanding of the topic, and at the same time, involves learners actively during synchronous sessions.

- **Use appropriate tools for online assessment**

One of the main advantages of digitally enhanced education is its automation. There is a vast range of tools and platforms that allow educators to design a meaningful educational experience, gather evidence of learning, monitor students' progress, and deliver timely feedback: immediate and automated, or manual and personalized.



Assessment

Moreover, these tools usually allow adaptations and re-use of content and activities, which saves time in the future courses and gives scope for ad-hoc amendments during the course.

Due to the constant development of digital tools and applications, educators can easily choose a tool that best suits the learning outcome. For goals laid in the first category of [Bloom's taxonomy](#) - remembering - teachers can choose distinct types of quizzes, for the fourth category, which is analysing more appropriate tools will be an e-portfolio or a group project conducted via a workshop tool.

Below, there are some examples of online tools and platforms for assessment (some of them were also mentioned and/or describe above):

- E-portfolio

An E-portfolio is a collection of students' work - evidence of learning, that could take different forms: visual, audio, written, presentations, assignments, small projects, journal. There are plenty of online platforms and tools that host the creation of e-portfolios, some more customizable, some more basic. It is also possible to create a room for e-portfolios on local LMS or simply on an educational file server. Portfolios are encouraging students to self-reflect on their learning process systematically, in a creative way. Students select the work that best depicts their attainment of a particular learning outcome and should be assessed. Portfolios do not only serve educational purposes. They can be used in the future as a showcase of a student's competencies. Therefore, it is important that portfolios are not just a compilation of random documents and presentations, but thoughtful, systematic work, the deliberate selection of the best work (Biggs and Tang, 2011).

- Rubrics

It is a set of criteria attached to a certain task/quiz. It requires a bit more time when preparing the course, but saves it afterwards. For students, clear and concise criteria are essential to plan their work and self-reflect. For teachers, rubrics help identify all the parameters for the task/assignment, according to which students need to be evaluated (Fisher, 2003) and automate the process.

- A forum

A forum, also called a discussion board, is a space on the learning platform/tool used by the institution where teachers and students can design discussions of diverse topics, related to the subject. Teachers can observe the maturity and quality of students' entries, students can demonstrate their understanding of the subject in different contexts, train critical thinking, reasoning, defending arguments, negotiating, convincing, and other transversal skills.

- Projects

Projects conducted online can be created using different tools. It can be an activity embedded in the institutional LMS (e.g., Moodle – wiki, workshop), MS Office package – MS Sway, MS Teams, or external tools of personal choice (e.g., Padlet, Prezi, Miro, Mural, Canva). Projects give students the opportunity to demonstrate their skills and knowledge in different contexts, and to develop their transversal skills such as critical thinking, logical reasoning, cooperation, creativity etc. What constitutes a project? It could be anything from having students prepare posters, writing compositions, performing web quests and then sharing findings. It could be executed individually or in groups.

- Online test/quizzes

Provided that the criteria and hints are set beforehand, they give immediate feedback without engaging the teacher. For students, they give scope for more than one attempt, if used as a formative, learning tool, or mixed versions with shuffled questions and answers when used as a summative form. There are quiz plug-ins in the majority of LMS available, as well as external online tools, such as Quizlet, MS Forms, Kahoot, Mentimeter, VixVote, AnswerGarden and others.

- Assignments

Written, or in any other form, assignments – similarly to projects – usually require using the knowledge attained during the course/unit/knowledge in a certain context, demonstrating the understanding of the subject. Assignments tend to be shorter and both: individual and collaborative. The Internet provides many tools to set up online

assignments, collect them, mark, store, retake and so on. Assignment tool is present in most LMSs, in MS Forms, Google Classroom and via external tools.

Institutional online exams manual

Each institution has its own tools and platforms, rules and practices. It is highly recommended preparing an institutional manual for setting exams on the platform. Exams take place only twice a year, therefore, teachers might feel overwhelmed with the number of settings and functions. Having a handy manual would make their preparation for exams easier and faster and prevent any problems caused by wrong settings.



Engage students in the assessment process

Engaging students in the assessment process is crucial, especially in an online learning environment, as the remote mode of learning requires self-regulation due to the lack of physical presence of the teacher, and often, the asynchronous format of learning. Therefore, self- and peer learning and assessment are essential tools to support self-regulated learning in digitally enhanced education.

Self-assessment

Giving the opportunity to self-reflect and self-assess their performance and understanding of studied contexts and content help students take more responsibility for their education and become more conscious about their learning. It allows them to observe certain patterns of errors and behaviours and think about their efficiency. According to Biggs and Tang (2011), in a teacher-led model of assessment, the student loses the ability to self-monitor and reflect on their own learning, and thus, is less prone to utilize their full potential to progress.

Peer-correction / peer-review

Peer assessments tend to be less stressful for students and foster better understanding of studied concepts. They also amplify development of various skills. It might happen that students are reluctant to criticize each other (Conrad & Donaldson, 2011). To assure transparency and cohesion of the process, it is necessary to determine (together with the students) the principles and criteria of the feedback (Liz et al., 1997). It could be done in the form of rubrics or by pointing out only the strengths of the product / performance and improvements rather than weaknesses or errors (Conrad & Donaldson, 2011).

Building and maintaining contact with students

According to the [COVID-19 time surveys' results](#), teachers do notice some differences between online and traditional teaching. However, judging by the fact that both students and teachers claim that they feel tired and overloaded with work in distant learning and teaching, one might conclude that virtual classes have not been modified in a way that would suit the e-learning environment.

The reasons for this situation might be twofold, namely, the first might be that teachers are simply used to the educational methods that worked for them in their traditional teaching, and they did not have time or were not willing to change them. The other reason might be that teachers lack training in online course design, and their understanding of online teaching specifics is rather intuitive and consequently superficial. Therefore, they do, for instance, notice that their students are not engaged in online learning, but they tend to transfer the responsibility for this fact to the students.

The main difference between online and offline learning, this section focuses on, is that it is much easier to gain students' attention in an offline class than in a virtual environment. Despite numerous research efforts related to learners' attention span, its precise length was never unanimously agreed upon, which might be the effect of the subjectivity in data collection such as e.g. quality of a class/lecture or subjectivity of inattention symptoms (Bradbury, 2016). On the other hand, studies show that attention is a key factor in the context of successful knowledge retention (Cicekci and Sadik, 2019) and identify interactions and activation exercises as activities that may help students to refocus on the class/lecture (Bradbury, 2016).

Due to the presence of direct human contact and direct or indirect students' feedback (facial expression, body language), interactions

Building and maintaining contact with students

and learners' activation are much more easily attainable in offline teaching than in a virtual class. Bradbury (2016) states that: "What is different between live and recorded event is the emotional buy-in. Certainly, books, or even videos, can be excellent media for conveying content, but a live teacher can inspire a student to think more about a subject and delve deeper into content than can be achieved by passive media alone." Analogically, a bare online course, even full of relevant and useful factual knowledge, but with no human interactions, will not be able to meet the same educational standards as a quality regular class. The quantity and most importantly the quality of interactions in the online course are directly correlated with students' achievement and satisfaction with the course (Mason and Rennie, 2006).

We should also remember that students attending regular classes are physically in the same room with their teachers and hence feel more obliged to actively participate in the course. Online students very frequently lack this motivation and are additionally distracted by numerous external factors such as e.g. the environment they are in or simply the technology they use (applications, social media, etc.). It is not possible for human beings to focus equally on many activities at the same time, especially in an educational context when we learn consciously (Cicekci and Sadik, 2019). Consequently, the solution to the problems mentioned above is to plan the interactions and activation exercises that would bring the "students back" to the virtual class and implement these exercises regularly in the course.

Recommendations for teachers:

● **Activate your learners**

- Use tools for quick interactions throughout a course or a lecture e.g. surveys, questionnaires, applications for brainstorming

- Design and engage students in meaningful learning activities

- Use interactive content and resources

Read more: [Keep the balance between formative and summative assessments](#)

- Use warm-ups and energizers

Read more: [Balance the synchronous and asynchronous learning](#)



Building and maintaining contact with students

- **Build social interactions**

- Create a community

Being part of a learning community is beneficial for students as it fosters knowledge acquisition, generates better learning outcomes and helps students to develop intellectually and personally (Pratt and Palloff, 2007, p.232).

It is recommended to give students time for building relationships and interacting with each other before involving them in subject content and cooperative learning.

Start the course with some [icebreaker](#) activities. They do not have to be necessarily connected with the subject taught. These activities are designed merely for interactions, and they aim to build the foundation for the future learners' community (for more, read also: [5-stage model](#)).

“Week Zero”

Pratt and Palloff (2007) suggest designing “Week Zero”. This is a part of the course introduced at its very beginning, before the course content itself. It is the time that should be allotted to icebreaker activities, introductions, and students' posts concerning their expectations for the course.

- Design group and peer activities.

Read more: [Implement cooperative learning](#)

- Introduce peer assessment where relevant.

Read more: [Engage students in the assessment process](#)

- Introduce engaging models such as:

- Project-based learning
- Inquiry-based learning
- Problem-based learning (PBL)
- E-tivities

Read more: [E-tivities](#), [Design the course using models supporting students' engagement](#)

- Gather feedback from your students

Gathering feedback from the students is, of course, a way of gaining data that is crucial for future changes and improvements in the course. However, it is also an important tool for social interactions, as it gives the students the possibility to express their thoughts, opinions, and share their feedback with their teacher. Consequently, the learners have the feeling that they have a real impact on the course itself.

- Invite experts to your course

Inviting external experts to online courses (mainly synchronous form) creates a link between the university studies and the real professional world and provides meaningful learning opportunities otherwise difficult to organize due to, e.g. geographical or time constraints.

- Plan your synchronous lectures in [4 phases](#)

Socialisation

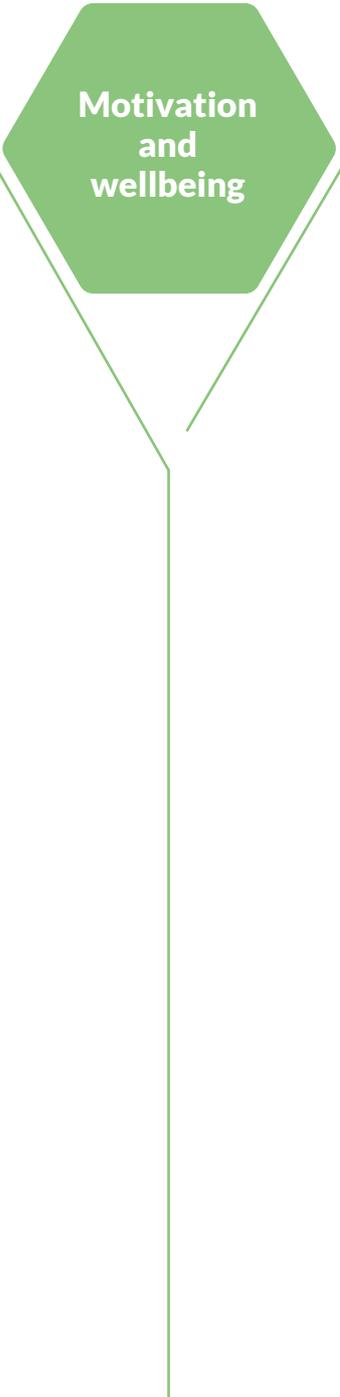
It is recommended that teachers introduce socializing activities at the very beginning and throughout the whole course, as such interactions are necessary for the effective learning process to happen (Asfaranjan et al., 2013). Socializing activities should be introduced even before the course itself begins, and they do not necessarily have to be linked to the subject taught. Their aim is to let the participants “bring their own luggage, anxieties, hopes and experiences” and to create “the basis of their very own micro-community” (Salmon, 2017). Salmon, in her “Five Stage Model”, also stresses the fact that the socializing stage should be moderated by the teacher who acts as a host in the course. Consequently, the moderator should be always present in the discussions, make rules and explain them to the students and finally give clear instructions, including instructions concerning the quantity and the length of the responses given by the students in their online conversations.

Read more about [the 5-stage model](#)

Another way to let the students get to know each other, in an online environment, is to incorporate group/pair activities in the course which are not only a powerful educational tool but also give the learners the possibility to further build their online community, make relationships and develop interdisciplinary skills.

While designing group activities, teachers should bear in mind such factors as, among others, learning goals, the size of the group, and the age of the students. It should be noted that all group activities have to be accompanied by clear instructions and some of them, such as e.g. forum discussions, would require the constant presence of the moderator.

We also advise teachers to create in their courses some common space with a merely integrative function. This might be e.g. a general forum or a group in any kind of social media, where students will have the possibility to discuss topics that are not necessarily connected to the subject matter.



**Motivation
and
wellbeing**

Motivation

One of the difficulties, mentioned by the teachers taking part in the survey, was the fact that they do not know how to motivate students to actively participate in online classes. Careful motivation design is a key element in teaching in general, but it is even more important in online teaching due to the lack of face-to-face contact with the teacher and other students.

First, it is crucial to bear in mind that “although motivation is often treated as a singular construct, even superficial reflection suggests that people are moved to act by very different types of factors” (Ryan & Deci, 2000). Consequently, people can be motivated e.g. simply because they value and enjoy the activity they are taking part in (intrinsic motivation) or because they are externally rewarded or punished for what they are doing (extrinsic motivation). However, it is really important that teachers do not treat intrinsic and extrinsic motivation as totally opposite concepts, as they are in fact complementary, and they do co-exist and the only question that should be considered is how much intrinsic or extrinsic motivation a particular person displays (Lepper, Henderlong Corpus, & Iyengar, 2005 p.190-191). According to Ryan and Deci (2000), learners cannot be intrinsically motivated all the time and in each and every situation. In reality, the majority of human learning is driven by extrinsic motivation due to the fact that we do live in a certain social context and the produce of our learning is dependent on the extent to which our non-intrinsic motivations are integrated and internalized (Ryan & Deci, 2000). Thus, in order to cater for students’ needs, we advise teachers to design their online courses, so as they take account of the whole spectrum of motivational factors.



**Motivation
and
wellbeing**

● **Make learning relevant for students**

One of the most powerful ways to boost students' motivation to learn is to engage them in meaningful activities, which are relevant to their lives or future professions. Theoretical classes are of course inevitable in the context of higher education, but we strongly recommend that practical activities or modules relate to the lives and experiences of the learners. Students who are personally interested in the topic, engage more in their learning process (Schallert & Reed, 2003).

In order to stay motivated, students need to know and understand the objectives and real-life benefits of the courses they participate in and knowledge should be “delivered in a way which encourages students to develop academic literacy and both subject-specific and generic skills which they can apply immediately in the real world, especially in the labour market (Report to the European Commission on Improving the Quality of Teaching and Learning in Europe’s Higher Education Institutions, June 2013).



**Motivation
and
wellbeing**

● **Add elements of gamification to your courses**

In order to increase students' engagement and motivation and to gain their attention in the learning process, we recommend the incorporation of games' elements into an online course. This process in education is called gamification.

Gamification vs. game-based learning

It is important to understand the difference between gamification and game-based learning, which is simply the use of games in a course. In contrast, “gamification in education is an ongoing process that harvests the most engaging game components and applies them to increase motivation and engagement among the learners.” The results

are realized in the long term as compared to game-based learning where engagement is “short-lived, usually during the duration of the game” (Alsawaier, 2017). “Once the game is completed, many learners or players do not have any more interest in a game they have mastered and completed” (Alsawaier, 2017). In other words, “gamification is not when learning is changed into a computer game but rather when adding a design layer of game elements to enhance learning, increase engagement, and encourage positive behaviour” (Alsawaier, 2017).

Exemplary elements of games that might enhance the learning experience (Alsawaier, 2017):

- avatars (increasing learner’s autonomy)
- quests and challenges (satisfaction from solving problems)
- badges (satisfaction after accomplishment of a certain level)
- points and levels (reward, reinforcement)

It is very important that gamification features are adjusted to a **particular learning situation**, to the **type of the learner** and to the **subject taught**.

The majority of the elements listed above are supposed to boost students’ extrinsic motivation, which is why gamification is not a key motivational element of the online course design but rather educational support.

However, gaming elements are also simply a source of fun, which in turn has been proved to increase intrinsic motivation: “...intrinsic motivation is the core that is associated with sports and gambling. Intrinsically motivated activities are those that the individual finds interesting and performs without any kind of conditioning, just by the mere pleasure of carrying them out (Francisco-Aparicio, GutierrezVela, Isla-Montes, & Sanches, 2013, p. 114)”.

According to Aparicio et al. (2013, p.115), in order to retain intrinsic motivation while using gamification, course designers should give their users a certain level of autonomy

(choice), adjust the level of challenges to the level of the user (competence) and assure relatedness (relations e.g. through integration with social networks).

Well-being

One of the major concerns expressed by the teachers during the “emergency” online teaching is the lack of contact with their students (see: [Survey of teacher’s needs](#)).

Teachers were frustrated as they were not able to see their learners, who frequently had their cameras turned off. Consequently, they did not have feedback from the students’ side, and they were not able to interpret their body language and respond to their reactions. Students also listed the lack of contact with their teachers and friends as one of the most significant disadvantages of online education (Długosz, 2020; Mazur, 2021). All these arguments only confirm the importance of socialization, interactions, emotions and empathy in teaching and learning, which are basically social activities (for more read: [Building and maintaining contact with students](#)).

An e-learning environment is not different in this respect. According to Pratt and Palloff, students should maintain the same level of contact in the virtual classroom as they do on the campus of a university. They claim that “this sense of presence, along with the relative anonymity of the online medium, may create a sense of freedom, allowing otherwise unexplored parts of their personality to emerge” (Pratt and Palloff, 2007).

Online education needs socializing activities to be planned beforehand even more than regular face-to-face classes, as it is less probable that they occur spontaneously in a virtual environment. What is more, all those interactions would require teachers’ involvement as initiators and moderators throughout the whole learning experience. It is also teachers’ responsibility to make sure that students feel welcome, comfortable and safe throughout the course.

Motivation and wellbeing

● Put a reasonable workload on your students

The results of the current surveys show that not only do teachers perceive online education as more time-consuming than regular classes. The same feeling accompanies students claiming that they spend much more time preparing for virtual courses as compared with face to face classes (NZS Report, 2020; Długosz, Foryś; Żurawski, 2020).

Understandably, e-learning generally requires more individual work from the students, however, teachers should be careful not to assign more tasks than usual.

Read more: [Minimalism in course design](#)

It is recommended:

- not to include too many tasks or materials in the course
 - to divide the content of the course into small, meaningful chunks
 - to plan courses in both synchronous and asynchronous forms
- Read more: [Balance synchronous and asynchronous learning](#)
- to prepare learner-friendly presentations: not overloaded with text or data
 - to ask students for feedback on how they are coping with the tasks

Motivation and wellbeing

● Create a safe learning environment

A safe learning environment is one of the key elements of each and every successful classroom. In a safe classroom, students feel comfortable, secure, confident and certainly more motivated. Consequently, they know what to expect from a course, they do not hesitate to ask questions and thus can concentrate on learning itself. Teachers “can have the greatest number of learning strategies on their tool belt and be willing

to engage each of their learner's multiple intelligences and learning styles, but if the learning environment is not safe, learners may not fully engage with these activities" (Clapper, 2010. p.5).

In order to be successful, remote learning should be designed with the same notion of security that is required of regular, face to face classes. Teachers willing to achieve that goal need to step down from the role of a mentor to a role of a facilitator, whose task is to create optimal learning conditions (Clapper, 2010), sometimes in cooperation with their students.

It can be achieved by:

- Involving students in a decision-making process, e.g.:
 - making rules together
 - contracts with groups
 - deadlines
 - students' fields of interest (students' projects, presentations)
 - teaching methods to be used
 - assessment methods

- Assuring adequate difficulty of the course and pace of learning, e.g.:
 - not too many tasks or content in the course
 - tasks that are not too difficult but still difficult enough for the students (zone of proximal development)
 - enabling self-paced learning (particularly comfortable in an online learning environment)

- Asking pre/post class questions and eliciting prior/background knowledge, e.g.:
 - pre-class knowledge assessment and post-class clarification
 - making connections between what students already know and what they still have to learn ([Experience-based teaching](#))



Motivation and wellbeing

Care for students' emotions

Empathy and simple acts of care are important, not only in the context of the COVID-19 pandemic but also during any form of learning. Students' basic human need of being understood may sometimes be satisfied with a simple question about their current feelings or mood.

In this specific COVID-19 situation, it is also necessary that teachers bear in mind that not only them but also their students join the classes from their "private space". Results of the surveys show that as many as one in five of the students claimed to have no access to a room where they can be alone while learning online (Długosz et. all, 2020). Thus, we advise teachers to inform their students that wherever they are, they should feel comfortable and welcome to the course. We also do not recommend unexpected, abrupt activities, such as questions asked to individuals, to be introduced after a long lecture as they not only increase stress but also make students unable to prepare for interaction.

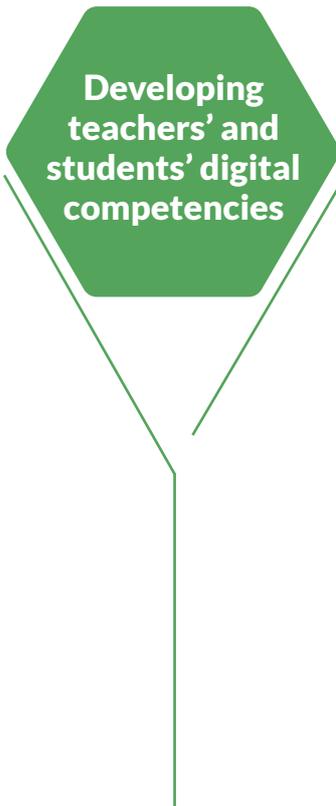
Examples of useful mood-measuring tools:

<https://classmood.upf.edu/>

<https://www.youhue.com>

Further reading:

<https://casel.org/fundamentals-of-sel/>



**Developing
teachers' and
students' digital
competencies**

Teachers' competencies

On one hand, technology became permanently intertwined with education, and all parties involved: teachers, students, administrative staff, were forced to quickly learn new skills and competencies that allow them to connect and navigate freely in digitally enhanced environments. On the other hand, the rapid growth of digitalization has been seen in all fields of life. Digital competencies have become an integral part of the silhouette of a citizen, and all European educational systems should include digital literacy in their curricula. Even though it is often said that students are digital natives and excel their teachers in terms of digital agility, yet there are many aspects of digitalization where they need guidance and support. They need to be trained not only on how to use technology but especially on how to do it responsibly, with the respect to privacy policies and licences, how to be safe on the Web and how to decide whether sources they find online are reliable. To follow the current digital policies and strategies, we recommend tackling the development of digital competencies for both teachers and students.

● **Support the development of teachers' online teaching competencies**

In order to positively influence and strengthen the development of students' competencies, teachers first need to look at their own digital aptitude. In 2017 European Commission issued the European Framework for Digital Competence of Educators (DigCompEdu), a standardized scheme that provides a reference and guides for working with teachers' digital competencies. It is advised for institutions and teachers to get familiar with the scope of the framework and map it against the training courses offered at the centres for teachers' development, and against the internal quality standards and curricula.

Reflect on your teaching practice

The very first step in planning one's digital competencies' development is to assess themselves against one of the accepted frameworks, such as DigCompEdu. Many European Erasmus projects have contributed to the development of self-reflection tools, which can be found online, such as [Check-In](#).

Self-assessment will allow a teacher to identify the areas his or her competencies are strong enough to reinforce their development for the students. At the same time, they will be able to spot the gaps they might want to explore, having in mind a benchmark of the DigCompEdu framework.

Once the areas have been identified, a teacher can look for a way to develop their digital teaching literacy. For example:

- Creating communities of practice

Post Covid-19 report on higher education in Poland (Klimowicz, 2020) indicates that teachers created informal practice groups using different online channels where they shared their experiences and good practices, asked questions, and looked together for solutions. Opening a space (whether online or offline) for teachers to learn from each other could be beneficial to building institutional knowledge and expertise in a very narrow community, and therefore, best matching the needs of the institution and its teachers. Examples of such community activities could be meet-ups to exchange good practices, mentoring etc.

- Co-design a course with colleagues

In institutions, there is usually more than one educator responsible for a certain subject area. It is recommended to think about what methods and activities best suit the subject collaboratively, exchange insights and good practices from previous experience and together prepare course materials and modules.

- Build internal know-hows

Investing in building institutional knowledge could be a tipping point in designing courses and learning materials. Educators directly participate in online courses and

observe how certain models, approaches, activities, and materials work. It is worth collecting best practices into an institutional database or posting them on the website for other teachers as an inspiration or even as Open Educational Resources.



**Developing
teachers' and
students' digital
competencies**

● **Train teachers on the experiential learning paradigm**

Taking into consideration the main assumption of Experiential Learning, that adults learn through experience, we recommend building the training courses and workshops for teachers' development on the Kolb' Cycle, so that teachers can experience learning by doing approach and in the sequel using the same approach when designing classes for their students.

Read more about [Experience-Based Learning](#) and [Experiential Learning Cycle](#)

Students' competencies



**Developing
teachers' and
students' digital
competencies**

● **Select appropriate online tools to facilitate various activities and learning outcomes and teach students how to work with them**

Keeping up with all online tools and applications can be challenging, and counterproductive. What is, however, crucial, is to understand the function of technology such as presenting, sharing, providing interactive content and quizzes. When teachers are aware of the functions, they can choose the tools that best serve the learning objectives and that they prefer. It is vital to think about technology as a means to facilitate teaching and learning, not as a complete goal itself (Bellanca et al., 2010).

The level of digital competence can vary among students, so can the equipment they possess and the internet connection they have access to. All these factors should be taken into consideration when designing activities and content for online courses. Whenever students are introduced to a new tool or platform, it is worth it, to begin with, a couple of warming-up activities and give students some space to learn and experiment with the new tool. This gives them a chance to upskill in a comfortable and safe environment before they start using the tool to submit assignments or cooperate online. This principle applies not only to online tools but also to certain digital skills students need to develop, such as looking for reliable sources online, using creative commons licences, safely storing files etc (Conrad & Donaldson, 2011).

In the case of differences in competency level between students, the teacher can start off with the group or pair activity and match more skilled students with those who lack experience with a particular tool or process. This way, students can learn from each other without being exposed to the whole group and reinforce their digital skills on the principle that we learn best when we teach others (Conrad & Donaldson, 2011). It is important to remember that too many tools and platforms can overwhelm students. They would have to remember which subject utilizes which platform and which assignment is set in which tool. Therefore, best practice will be to set up a course on the institutional LMS platform and introduce students to one new tool at a time, monitoring and tracking how the development of skills progresses.

Read more: [Minimalism in course design](#)

6. Final remarks

The Covid-19 crisis accelerated the transition from traditional forms of teaching and learning to digitally enhanced and student-centred. Teachers who remained resistant to digital changes were forced into accepting the changing reality and upskill accordingly. The Emergency Remote Teaching created a great potential and basis for developing digitally enhanced education in Higher Education. The StudES project attempts to diagnose the areas teachers need support and training and propose solutions to address these needs. This report presents a set of recommendations for building a stimulating online learning environment and contributing to students' success and wellbeing. The recommendations were selected according to the conclusions of the research conducted by the StudES Working Group 1 and substantiated by existing policies, models and research studies. The Roadmap of Recommendations serves as a benchmark for developing further solutions within the projects: Online Teachers Training Course and Quality Standards. However, it could also be used as a stand-alone instrument to develop institutional complex learning environments and digital teaching strategies.

7. Appendix

Bloom's Taxonomy

The Taxonomy of Educational Objectives proposed by Benjamin S. Bloom is a scheme that classifies learning objectives into several categories based on their cognitive complexity and level of abstraction: Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation. Each learning objective consists of two elements: a subject matter content and the indication of what should be done with this content, usually in the form of a verb phrase. In its revised version by Anderson and Krathwohl, (2001), the categories are called: Remembering, Understanding, Applying, Analysing, Evaluating, Creating. Each of the six categories consists of several associated verbs that encode the cognitive process of interacting with the subject. For example, in the category Remembering, there are verbs such as recognizing, listing, describing etc. To assure that students during a course attain full competency, not only the knowledge but also skills and attitudes, Bloom's Taxonomy can be used as a very practical guide to form learning objectives.

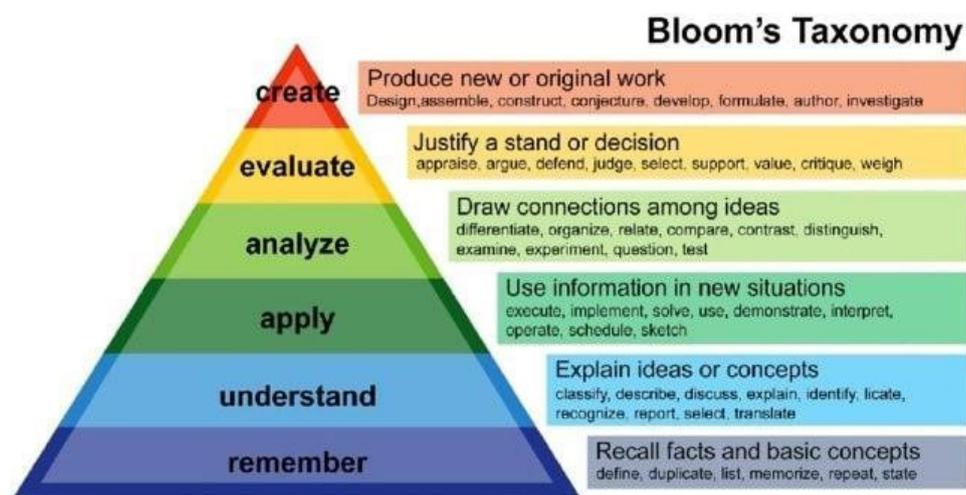


Figure 1. Ben-Jacob, M.G. (2017) Assessment: Classic and Innovative Approaches. Open Journal of Social Sciences, 5, 46-51. <http://dx.doi.org/10.4236/jss.2017.51004>, CC BY 4.0

Online Icebreakers

Social presence and individuality are far more difficult to achieve in a virtual, remote learning environment. Similarly, it is much harder to build any kind of relationship and interaction. One of the methods typically used at the beginning of the asynchronous course or synchronous session is an icebreaker. It has three major functions in online learning. First, it creates a safe and casual atmosphere for students to anchor themselves in the online environment, transfer from the activities they were doing before and set their minds into a new situation. Moreover, if well-designed, it invites all participants to establish their individual presence in this new educational situation, and finally, it gives students the chance to “warm-up” with the tool they are going to work with. In traditional, classroom/auditorium settings, students also go through this transition period at the beginning of each class – they greet each other, prepare notebooks and pens, and take seats. They finish conversations and start feeling the atmosphere of the classroom. This happens naturally. In an online environment, it will not happen naturally, it must be previously designed by the teacher to give students a chance and space to “land” in the educational space before they move on with the topic. The icebreaker should not be “an entry quiz” checking students’ knowledge from the previous session. This can happen later. Before, students need to settle down online and feel comfortable (Conrad & Donaldson, 2011).

Examples of online icebreakers:

<https://www.uwb.edu/it/teaching/remote-instruction/icebreaker-ideas>

<https://fye.uconn.edu/icebreakers-community-builders/#>

<https://www.celt.iastate.edu/teaching/teaching-with-technology/instructional-strategies/discussions/icebreaker/>

5-stage model

Adults learn through matching the new experiences with their previous experience (which is better described in [Kolb’s Cycle section](#)). The 5-stage model proposes scaffolding the course content into 5 phases, during which adult learners can gradually

build on their previous experiences, considering the online environment the learning process takes place. Salmon's research proved that the more comfortable the learners are, the more they learn, so the content and activities in online courses can gradually become more complex and self-directed.

- Stage I: Access and Motivation

The first stage, called Access and Motivation, happens at the beginning of the course. Users log in, feel uncomfortable with an unfamiliar environment, and do not see each other. During this time, it is especially important to give participants of the course clear instructions on how to use the platform/tool and let them experiment, welcome them, and encourage them to introduce themselves. An effective way to do so is to use an online [icebreaker](#) (2002).

- Stage II: Online Socialization

Another phase the learner goes through is called Online Socialization. At this point, learners are familiar with the learning environment enough to mark their online identities and find out about other participants. During this phase, it is best to encourage learners to get to know each other through group activities, using forums or communicators. It is also the right time to start progressively introducing students to the topics of the subject area. Instructions and tasks should be very structured and simple.

- Stage III: Information Exchange

In the third stage, called Information Exchange, students begin to interact with the knowledge and each other progressively. Students feel more comfortable about the learning environment and the other participants, they appreciate automated feedback and unlimited and fast access to information and begin to take advantage of technology boosting the learning process. Tasks can be more challenging and promote cooperation.

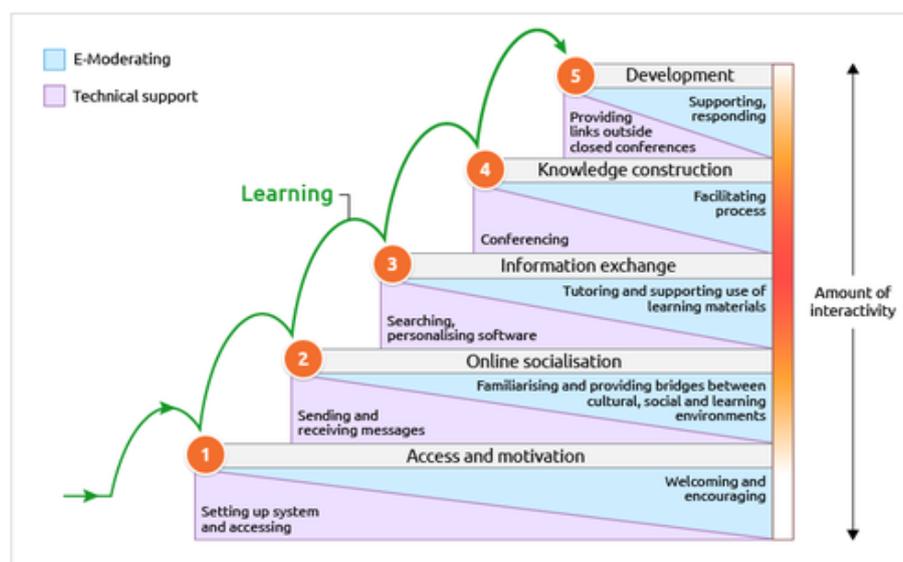
- Stage IV: Knowledge Construction

At stage four, Knowledge Construction, students build and deepen their knowledge and skills. The participants take more and more control over their own learning process,

while the instructor designs the tasks in such a way as to enable the participants to work independently and offers support during this work.

- Stage V: Development Phase

In the final, fifth stage, referred to as the Development Phase, students draw conclusions and summarize the knowledge and competencies gained during the course, build connections between what they learned during the course and their scientific interests/ learning process, etc. they wonder how to use new skills in practice.



Source: <https://www.gilysalmon.com/five-stage-model.html>

E-tivities

E-tivity is a concept proposed by Gilly Salmon (2002), which stands for active and interactive learning in an online environment. It is a short activity that could be designed with any subject at any online course. It proposes students' engagement, interaction, as well as individual reflection. According to Gilly Salmon, „e-tivities are important for the online learning world because they deploy useful, well-rehearsed principles and

pedagogies for learning but focus on their implementation through the best of networked technologies” (2000).

The structure of e-tivities is simple. The first ingredient is a spark, which function is to inspire and trigger further activity. It could be anything from a short instruction to the task, to more engaging reading or listening, that inspires and inputs some content into the task, or even a synchronous meeting. Then comes reflection. The first task is to individually reflect on the material. It can be filling in a quiz, answering the question, posting to the forum. Last comes collaboration/interaction. The second part of the task is to engage the product of the reflection stage into collaborative learning with others. It could be commenting on others’ posts in a forum, finding something in common, giving feedback. It could be a project or group work. Likewise, it could be peer correction. At the very end, the teacher consolidates the knowledge and sums up the activity with all the participants. It can be done as a final comment on the forum, feedback to groups, or during synchronous sessions.

Backward Design

It is a method proposed by Wiggins and McTighe, according to which a teacher should first identify the results of teaching and learning, then determine what evidence is going to confirm that result. At the last point, the teacher will plan activities and content that would lead students to expected results (1998).

The name “Backward Design” is meant to draw teachers’ attention away from well-known textbooks, old presentations, and lesson plans and direct it to the realistic goals, established based on educational context, students’ needs, their prior knowledge and observed standards. Only by having in mind what students need to know after the course, the teacher can design the roadmap on how to get there.

The steps of the Backward Design:

1. Aligning the learning outcomes with the standards (frameworks, curricula), educational context and students’ needs to identify the results of the learning (and teaching).

2. Anticipating acceptable evidence that demonstrates students' knowledge and skills – in other words – how the teacher will know that students reached expected results.

3. Designing meaningful activities and types of content that is going to lead students to achieve previously set results and enable them to produce sufficient evidence of their understanding (Wiggins & McTighe, 1998).

When teachers focus on learning objectives and provide clear steps to achieve them, supported by appropriate forms of monitoring progress and evaluation, students will be better informed of what the teacher's expectations are without putting too much focus on grades.

4-stages webinar design

Students' engagement during video-conferencing forms of learning needs to be gradually built from the first minute of the class. If students for 45 min straight listen to the lecture (while being comfortable in their own houses), then when asked a question or invited to an activity they most probably will be shocked and unable to quickly switch into a more active mode of participation. Therefore, their involvement in the synchronous class needs to be gradually built up. Helpful might be the adaptation of Conrad and Donaldson's „Phases of Engagement” model. The original model depicts how students' engagement is built throughout the course (Cannon, 2020). Likewise, in short, synchronous sessions, educators can successfully stimulate students' involvement by implementing the following phases and activities specific for each phase:

1. Warm-up phase: students need simple [icebreaker](#) activities that will allow them to feel comfortable in the new environment and get to know other students.

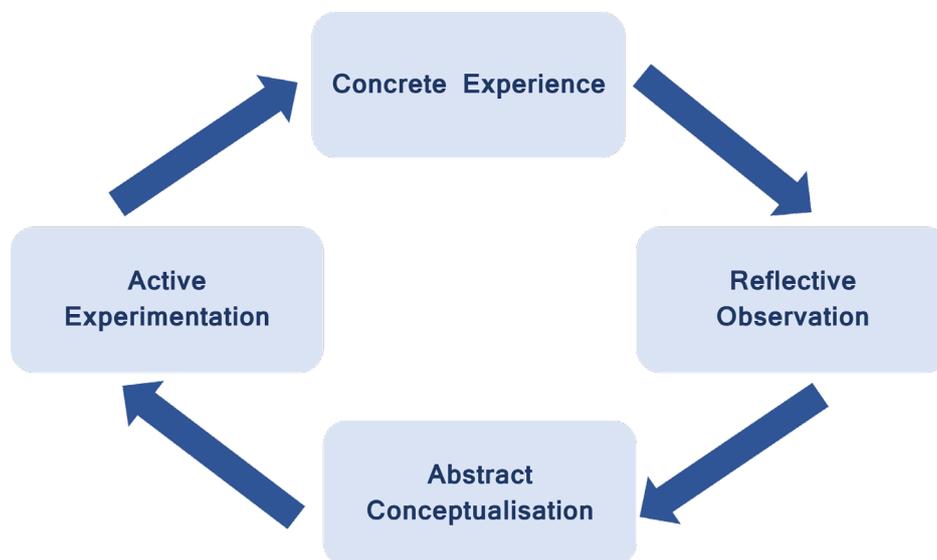
2. Exploration phase: Right after the warm-up, students should be invited to another simple activity that is already embedded in the topic of the class. It is very important that the activity is not too difficult and serves more as a “warm-up to the topic”.

3. Substantial content phase: after participating in at least two simpler activities, students are prepared to be exposed to more challenging content and tasks. They feel comfortable enough to participate in tasks and contribute to the discussion, they are also accustomed to the active form of participation.

4. Conclusion: at the end of the session, it is best to consolidate the knowledge together with students or invite them to self-reflect on the lesson and make links to other topics covered during the course.

Experiential Learning Cycle

Kolb's cycle is based on the premise that when adults learn, they juxtapose knowledge with experience. "Learning is the process whereby knowledge is created through the transformation of experience" (Dunlap, Dobrovolny, & Young, 2008). The model consists of 4 phases, as shown in the figure below:



Source: Centre of e-Learning AGH based on Van der Horst, C.A., & Albertyn, R.M. (2018). The importance of metacognition and the experiential learning process within a cultural intelligence-based approach to cross-cultural coaching. SA Journal of Human Resource Management.16(0), a951.

The first phase is called Concrete Experience. The learner is immersed in direct interaction with a concept. In the second phase, called Reflective Observation, the learner reflects on that experience and juxtaposes it with his previous experiences and background. The reflection is followed by the third phase, Abstract Conceptualization. The learner tries to put the new experience (shaped by the reflection phase) into a tangible model, theory, visualization. In the final, fourth phase - Active Experimentation, the generalized new model is put into practice, further experiments, different contexts. The cycle however does not end there. The Active Experimentation phase brings a new experience, which the learner can reflect on, conceptualize, and practice again. As the result, the cycle turns into a spin (Konak et al., 2014). Kolb's Experiential Cycle constitutes a basis of Experiential Learning Approach or Experience-Based Learning.

8. References

Abdulwahed, M., & Nagy, Z. K. (2009). Applying Kolb's Experiential Learning Cycle for Laboratory Education. *Journal of Engineering Education*, 98(3), 283–294.
doi:10.1002/j.2168-9830.2009.tb01025.x

Alsawaier, R. (2017). The effect of gamification on motivation and engagement. *International Journal of Information and Learning Technology*, DOI: 10.1108/IJILT-02-2017-0009

Andresen, L., Bound, D., Cohen, R. Published in Foley, G. (Ed.). *Understanding Adult Education and Training*. Sydney: Allen & Unwin, 207-219, DOI: 10.4324/9781003118299-22 <https://www.researchgate.net/publication/284211114>

Asfaranjan, Y.S., Shirzad, F., Baradari, F., Salimi, M., Salehi, M. (2013). Alleviating the senses of isolation and alienation in the virtual world: Socialization in distance education. *Procedia - Social and Behavioral Sciences* 93, 332 – 337, DOI:10.1016/j.sbspro.2013.09.199

Beetham, H., & Sharpe, R. (2007). *Rethinking Pedagogy for a Digital Age* (1st ed.). Routledge.

Bellanca, J. A., Brandt, R., Barell, J., Darling-Hammond, L., Dede, C., DuFour, R., DuFour, R., Fisher, D., Fogarty, R. J., Frey, N., Gardner, H., Hargreaves, A., Johnson, D. W., Johnson, R. T., Kay, K., Lemke, C., McTighe, J., November, A., Pearlman, B., . . . Seif, E. (2010). *21st Century Skills: Rethinking How Students Learn* (Leading Edge) (1st ed.). Solution Tree.

Biggs, J., & Tang, C. (2011). *Teaching For Quality Learning At University* (Society for Research into Higher Education) (4th ed.). Open University Press.

Blyth, W. A. L., Bloom, B. S., & Krathwohl, D. R. (1966). Taxonomy of Educational Objectives. Handbook I: Cognitive Domain. *British Journal of Educational Studies*, 14(3), 119. <https://doi.org/10.2307/3119730>

Bradbury, N. A. (2016). Attention span during lectures: 8 seconds, 10 minutes, or more?, retrieved from: <https://doi.org/10.1152/advan.00109.2016>

Burke Money Penny, D., Evans, M., & Kraha, A. (2018). Student Perceptions of and Attitudes toward Peer Review. *American Journal of Distance Education*, 32(4), 236–247. <https://doi.org/10.1080/08923647.2018.1509425>

Cannon, J. A. (2019–2020). Increasing Student-to-Student Engagement: Applying Conrad and Donaldson’s “Phases of Engagement” in the Online Classroom. *Colleague 2 Colleague Digital Magazine*, 1(12), 5–21. <https://scalar.usc.edu/works/c2c-digital-magazine-fall-2019--winter-2020/index>

Cicekci, M.A., Sadik, F. (2019). Teachers’ and Students’ Opinions About Students’ Attention Problems During the Lesson. *Journal of Education and Learning*; Vol. 8, No. 6, DOI:10.5539/jel.v8n6p15, https://www.researchgate.net/publication/336794798_Teachers_and_Students_Opinions_About_Students_Attention_Problems_During_the_Lesson

Clapper, T. C. (2010). Creating the safe learning environment. *PAILAL*, 3(2), 1-6.

Clark, R. C., & Mayer, R. E. (2016). *e-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning* (4th ed.). Wiley.

Conrad, R., & Donaldson, A. J. (2011). *Engaging the Online Learner: Activities and Resources for Creative Instruction* (Updated ed.). Jossey-Bass.

DigCompEdu. Punie, Y. (ed). EUR 28775 EN. Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-73494-6, doi:10.2760/159770, JRC107466

Długosz, P. (2020). Raport z II etapu badań studentów UP. Opinia na temat zdalnego nauczania i samopoczucia psychicznego.

Długosz, P., Foryś, G. (2020). Zdalne nauczanie na Uniwersytecie Pedagogicznym im. Komisji Edukacji Narodowej w Krakowie z perspektywy studentów i wykładowców. [Raport-ze-zdalnego-nauczania-wśród-studentów-i-pracowników-UP.pdf](#)

Dumont, H. (2010). Educational Research and Innovation The Nature of Learning: Using Research to Inspire Practice (Education Research and Innovation) (n ed.). OECD Publishing.

Dumont, H., Istance, D., & Benavides, F. (2010). The Nature of Learning. Using research to inspire practice. OECD.

Dunlap, J., J. Dobrowolny, and D. Young. 2008. Preparing e-learning designers using Kolb's Model of Experiential Learning. Innovate 4 (4). <http://www.innovateonline.info/index.php?view=article&id=490>

European Commission. High Level Group on the Modernisation of Higher Education. (2013). Report to the European Commission on improving the quality of teaching and learning in Europe's higher education institutions. Publications Office of the European Union.

Fisher, M. M. (2003). Designing Courses and Teaching on the Web. Amsterdam University Press.

Feldstein, M. (2002). <https://elearnmag.acm.org/featured.cfm?aid=566782>

Five Stage Model. (2017). Gilly Salmon. <https://www.gillysalmon.com/five-stage-model.html>

Francisco-Aparicio, A., Guti'érrez-Vela, F., Isla-Montes, J., & Sanches, J. (2013). Gamification: Analysis and application. In V. Penichet, New trends in Interaction, Virtual Reality and Modeling, Human Computer Interaction Series (pp. 113-126). London: Springer-Verlag

Frey, N., Fisher, D., & Everlove, S. (2009). Productive Group Work: How to Engage Students, Build Teamwork, and Promote Understanding (1st ed.). ASCD.

Fruhling, Z. (2020, May 14). The Minimum Viable Course | Resilient Educator. ResilientEducator.Com. <https://resilienteducator.com/instructional-design/the-minimum-viable-course/>

Grodecka, K., Kusiak, J., & Marković, J. (2010). Openness in Higher Education. How to set institutional repository of OER (case of AGH-University of Science and Technology). Www.Cel.Agh.Edu.Pl. https://www.cel.agh.edu.pl/wp-content/uploads/2010/10/EAD-TU_AGH.pdf

Hanaa Ouda, Khadri Ahmed (2016). Flipped Learning as a New Educational Paradigm: An Analytical Critical Study, European Scientific Journal

Klimowicz, M. (2020). Polskie uczelnie w czasie pandemii. Fundacja Centrum Cyfrowe Projekt SpołTech. <https://centrumcyfrowe.pl/spoltech/>

Kolb, Alice Y. and Kolb, David A. (2017) „Experiential Learning Theory as a Guide for Experiential Educators in Higher Education,” Experiential Learning & Teaching in Higher Education: Vol. 1 : No. 1 , Article 7.

Konak, A., Clark, T. K., & Nasereddin, M. (2014). Using Kolb’s Experiential Learning Cycle to improve student learning in virtual computer laboratories. Computer & Education, 72, 11–22. <https://doi.org/10.1016/j.compedu.2013.10.013>

Krathwohl, D. R. (2002). A Revision of Bloom’s Taxonomy: An Overview. Theory Into Practice, 41(4), 212–218. https://doi.org/10.1207/s15430421tip4104_2

Laurillard, D. (2012). Teaching as a design science. Building pedagogical patterns for learning and technology. Routledge. New York

Lepper, M. R., Henderlong Corpus, J., & Iyengar, S. S. (2005). Intrinsic and extrinsic motivational orientations in the classroom: Age differences and academic correlates. *Journal of Educational Psychology*, 97(2), 184-196. doi: 10.1037/0022-0663.97.2.184

Liz, B., David, B., Pal, M., & Adam, W. (1997). *Using Technology in Teaching and Learning* (1st ed.). Routledge.

Lockwood, F. (1998). *The Design and Production of Self-instructional Materials* (Open and Flexible Learning Series) (1st ed.). Routledge.

Mason, R., Rennie, F. (2006). *Elearning. The key concepts*. Routledge. Taylor & Francis Group. London and New York

Mazur, J. (2021). *Nauczanie zdalne. Oswojenie (nie)znanego. Wpływ pandemii COVID-19 na szkolnictwo wyższe*, Inkubator Uniwersytetu Warszawskiego

National Forum. (2021, July 18). Introduction to Open Educational Resources (OER) & Open Licensing – National Resource Hub. <https://hub.teachingandlearning.ie/resource/introduction-to-open-educational-resources-oer-open-licensing/>

National Forum. (2021a, July 2). How to Choose an Open Licence – National Resource Hub. <https://hub.teachingandlearning.ie/resource/how-to-choose-an-open-licence/>

Open Educational Resources (OER). (2021, August 5). UNESCO. <https://en.unesco.org/themes/building-knowledge-societies/oer>

Pollock, J. E. (2011). *Feedback: The Hinge That Joins Teaching and Learning* (1st ed.). Corwin.

Raport NZS. *Sytuacja studentów w czasie epidemii koronawirusa*. Warszawa 2020. https://nzs.org.pl/wp-content/uploads/2020/04/NZS_Sytuacja-studentow_w-czasie-epidemii_koronawirusa.pdf

Redecker, C. European Framework for the Digital Competence of Educators: Report to the European Commission on Improving the Quality of Teaching and Learning in Europe's Higher Education Institutions (June 2013) <https://op.europa.eu/en/publication-detail/-/publication/fbd4c2aa-aeb7-41ac-ab4c-a94fee9eb1fy>

Ryan, R. M., Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.
doi: 10.1037/0003-066X.55.1.68

Salmon Gilly, <https://www.gillysalmon.com/five-stage-model.html>

Salmon, G. (2000). *E-Moderating: the Key to Teaching & Learning Online* (1st ed.). Routledge.

Salmon, G. (2002). *E-Tivities: The Key to Active Online Learning* (1st ed.). Routledge.

Schallert, D. L., Reed, J. H. (2003). Intellectual, motivational, textual, and cultural considerations in teaching and learning with computer-mediated discussion. *Journal of Research on Technology in Education*, 36(2), 103-118

Shank, P. (2007). *The Online Learning Idea Book, Volume 1: 95 Proven Ways to Enhance Technology-Based and Blended Learning* (1st ed.). Pfeiffer.

Shank, P. (2017). *Practice and Feedback for Deeper Learning* (Vol. 2). Learning sPeaks Publications.

The Flipped Classroom Explained | Flipped Learning in Adelaide. (2018). Adelaide.Edu.Au. <https://www.adelaide.edu.au/flipped-classroom/about/>

Flipped Classroom Resources | Flipped Learning in Adelaide. (2018). Adelaide.Edu.Au. <https://www.adelaide.edu.au/flipped-classroom/resources/>

Wiggins, G., & McTighe, J. (1998). Understanding by design. Goglobal.Fiu.Edu. <https://educationaltechnology.net/wp-content/uploads/2016/01/backward-design.pdf>

Wiley, D. , <http://opencontent.org/definition>

When we share, everyone wins. (2021, May 24). Creative Commons. <https://creativecommons.org/>

Żurawski, A. (2020). Raport syntetyczny wyników ankiety dot. nauczania zdalnego. Semestr letni 2019/20. [Raport syntetyczny wyników ankiety dot. nauczania zdalnego semestr letni 2019_2020.pdf \(sgh.waw.pl\)](https://www.sgh.waw.pl/raport-syntetyczny-wynikow-ankiety-dot-nauczania-zdalnego-semestr-letni-2019-2020.pdf)