LS4VET

Lesson Study for VET

Teachers' Collaboration
for Improving the Quality of
Vocational Education and Training
2020-2023

LESSON STUDY FOR VOCATIONAL EDUCATION & TRAINING

—

LS4VET eCourseBook

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1. LS4VET DESIGN — FOCUS ON PLANNING

1.1 DESCRIPTION OF THE MODULE

1.1.1 AIM

The goal of this module is to familiarise the participants with the development of effective LS4VET designs applying the key principles of Lesson Study as a cross-boundary collaboration through inquiry in the context of VET (Vocational Education and Training). This process requires participants to be able to carry out pre-studies to plan research lessons in collaboration with Lesson Study team colleagues, knowledgeable others from various fields and/or Lesson Study facilitators, as well as with their learners as active participants with a voice in a responsive way. At the end of the module, the participants will be able to set up Lesson Study teams and to design Lesson Study cycles in alignment with negotiated Lesson Study goals.

1.1.2 ENTRY REQUIREMENTS

None

1.1.3 CONTENT

1. Cross-boundary collaboration and learning through collaborative practitioner research in VET

2. Theories, resources, and strategies in Lesson Study design

3. Knowledgeable others, Lesson Study facilitators, and stakeholders in Lesson Study

4. The LS4VET model

1.1.4 GOALS

The participants…

1. understand the key principles of cross-boundary collaboration and learning through inquiry in VET and are able to apply them in effective Lesson Study designs.

2. know resources and strategies to carry out pre-studies to design Lesson Study research lessons based on a theoretical understanding appropriate for VET target groups.

3. know the various roles of knowledgeable others and Lesson Study facilitators and are able to establish collaboration with stakeholders from schools/higher education institutes/the industry to create better learning opportunities for students.

4. are able to plan Lesson Study cycles and collaboratively implement them in LS4VET research lesson designs.

1.1.5 LEARNING OUTCOMES

The participants…

1. know and analyse the role of Lesson Study as cross-boundary collaboration and learning through inquiry in VET.

2. identify and make use of appropriate resources and strategies in pre-studies in alignment with research lesson goals/questions.

3. justify the application of selected strategies to involve VET learners as active participants with a voice in a Lesson Study design.

4. establish cross-boundary collaboration with knowledgeable others and/or facilitators from education and/or the industry to create better learning opportunities for students.

1.1.6 ASSESSMENT

Successful completion of the module requires the participants to

1. create a Lesson Study research design in context of their own VET:

   a) in alignment with selected research lesson goals/questions.

   b) in collaboration with education and/or industry, and

   c) with learners as active participants (group work, 50%)

2. participate actively in e-learning and complete course tasks (individual and group work, 50%)

Assessment is based on a 4.0 criterion-oriented scale (see Appendix).

1.1.7 DURATION OF MODULE, ESTIMATED WORKLOAD AND MODE OF DELIVERY

3 weeks

1 ECTS

40 % e-learning and self-study

40 % digital face-to-face collaboration

20% analog or blended face-to-face collaboration

1.2 PHASE 0: WHY CONDUCT LESSON STUDY IN VET?

1.2.1 INTRODUCTION

To ensure effective, high quality Education, in addition to continuously improving curricula, there is a strong need to introduce systematic approaches to, and opportunities for, the initial and continuous professional development of VET teachers, trainers and mentors. VET teachers/trainers need to continuously improve not only their vocation-specific competences, but also their pedagogical methodological skills.

Lesson study (LS) is a collaborative professional development practice in which teachers work together for improving instructional practices, in collaboration with other stakeholders. It has been in use in Japan since the 1870s. Due to its effectiveness, it has been in use worldwide for some decades in various educational and cultural contexts and fields, but not to VET previously.

Lesson study has the following five big ideas (Goei et al., 2021):

1. **Teachers collaboratively perform research on challenges and opportunities in their teaching practice.** The essence of the first big idea in VET is to improve student learning through teachers' investigation of

new teaching methods and their collaboration (also with industry) in the design, implementation, evaluation, and reflection of research lessons over an extended period of time.

2. **LS involves combining practical knowledge and external knowledge in innovative ways.** In a VET context, the second big idea thus includes establishing cross-boundary collaboration with knowledgeable others and/or facilitators from education and/or the industry to create better learning opportunities for students. LS in VET should expand teachers' horizons through co-creating VET education in collaboration with students, colleagues, industry-partners and other teams, sectors, educational institutes, and countries.

3. **LS is about learning from students' learning.** LS in VET should lead to teacher's better understanding of their students' learning and what kind of VET-pedagogy is effective for students' learning.

4. **LS is a collaborative effort of teachers with each other and with knowledgeable others**. In a VET context, LS involves teachers in job-embedded collaboration and research about theories and methods of authentic teaching and learning, wherever possible in collaboration with the labour market. LS in VET should aim at a learning culture and collaborative professionalism and enable deep collaboration between teachers and stakeholders from industry about challenges and chances they experience in their teaching practice.

5. **LS requires iterative cycles of research lessons**. LS in VET should encourage teacher learning that is disseminated across practices, within and across VET-institutions."

1.2.2   BECOMING ADAPTATIVE TEACHERS THROUGH LESSON STUDY IN VET

In the 21st century, vocational education and training must face and address multiple challenges all around the world: rapidly changing needs of the economy, transforming jobs and working environments related to fast digital technology development, and the challenging task of educating heterogeneous groups of students with diverse learning needs or school experiences. In addition, increasing emphasis is put on creating more and better opportunities for the initial and continuous professional development of VET teachers, with a focus on equipping them with the adequate skills and tools for and through digital technologies.

To fulfil this pedagogical change, there is a need for adaptive VET teachers who have the ability to respond quickly and adequately to new circumstances.

Adaptive teachers are reflective by nature and *"use knowledge of multiple variables and create entirely new and innovative solutions to the complexity of their teaching".*

Adaptive teaching is defined as carefully and proactively planning the curriculum, teaching materials and learning activities, as well as flexibly responding to students' learning needs in the social context of the classroom in order to reach the desired lesson objectives.

LS played a pivotal role in influencing teachers' perceptions, showing how teachers have become more aware of students' different educational needs and how they address these needs accordingly. Therefore, LS was adapted to the context of vet and has three objectives as follows;

1. **Developing adaptive teachers through inquiry** – involves the skill of teachers to deal with unexpected and novel situations. We see this as the foundation and starting point for engaging teachers in Lesson Study.

2. **Cross boundary collaboration and learning** - involves all stakeholders (students, teachers, lesson study facilitators, knowledgeable others, industry-based practitioners). We believe that teachers learn a lot from their workplace in the industry and by observing each other's practices. An implication of this is

that LS4VET teams should always include one or more VET teacher(s) in work- and practice-based subjects (e.g.: chef, pâtissière, bartender, etc.).

3. **Sustainability** - the ultimate aim of the LS4VET model should be that Lesson Study becomes a sustainable process within the institution and possibly beyond. Lesson Study in VET should include aspects of how this sustainability may be attained among participants and actors.

1.3 STEP 0: LESSON STUDY IN VET

1.3.1 LESSON STUDY PROCESS AND LS4VET MODEL

Lesson Study is a bottom-up approach to teachers' professional development based on professional collaboration and practitioner inquiry. It is an activity initiated and carried out by the teachers, in which they investigate a challenge or problem in their daily teaching practice following certain steps. The essence of Lesson Study is for teachers to discover new, more reflective, and effective approaches in their work for the improvement of students' learning.

There are seven steps in the LS4VET process;

Step 1 – Organise the team, set the goal

Step 2 – Study alone and together

Step 3 – Plan teaching unit

Step 4 – Research lesson: teach and observe

Step 5 – Analyse and discuss

Step 6 – Repeat: Revise, improve, teach, observe, analyse & discuss teaching unit

Step 7 – Reflect and disseminate

These steps are important **to carry out** a lesson study, however, the LS4VET model is important for **designing** a lesson study in VET.

In this chapter you will get acquainted with the process and the model so you can design a lesson study with your team.

1.3.2 LESSON STUDY PROCESS

Step 1 Organize the team, set the goal

- Facilitator organizes meetings with the LS4VET team aimed towards identifying a problem/interest/question for conducting a research lesson and for developing a work plan.
- The LS4VET team and facilitator liaise with the LS meta school community and the school manager to present and discuss lesson study design.

Step 2 Study alone and together

- The LS4VET team, supported by the facilitator, engages in research for materials on the identified problem/interest/question.
- The LS4VET team and the facilitator communicate with knowledgeable other/s and/or students to clarify goal/s of the lesson study.

- The LS4VET team, supported by the facilitator, identifies useful resources to inform the planning of the lesson.
- Facilitator shares lesson study design with the school manager.

Step 3 Plan teaching unit

- The LS4VET team and facilitator engage in lesson study research lesson planning and develop observation and interview schedules involving knowledgeable others and students as needed and agreed upon by the team.
- The LS4VET team and facilitator, in collaboration with the LS meta school community, find time slots for teaching the research lesson, interviewing the students, and for holding a post-lesson discussion,
- School manager invites knowledgeable others and observers to observe the teaching of the research lesson as in Step 4.

Step 4 Research lesson: teach and observe

- One LS4VET member teaches the research lesson to a class/group of students.
- Other LS4VET team members and knowledgeable others, which may include the facilitator, observe the research lesson and collect data.

Step 5 Analyze and discuss

- The LS4VET team holds a post-lesson discussion.
- Facilitator leads the session by following the post-lesson discussion guide.
- Based on the post-lesson discussion, one member of the LS4VET team takes note of what worked well and of suggestions for the adaptation of the research lesson.

Step 6 Repeat: Revise, improve, teach, observe, analyze & discuss teaching unit

- Repeat steps 3 to 5.
- Redesign the lesson with amendments.

Step 7 Reflect and disseminate

- The LS4VET team, led by the facilitator, writes a report that documents the whole lesson study process.
- The LS4VET meta school community contributes feedback to the final report in view of organizing future professional development initiatives and lesson studies.
- The LS4VET team and facilitator disseminate the lesson study experience and findings with the school community and beyond.
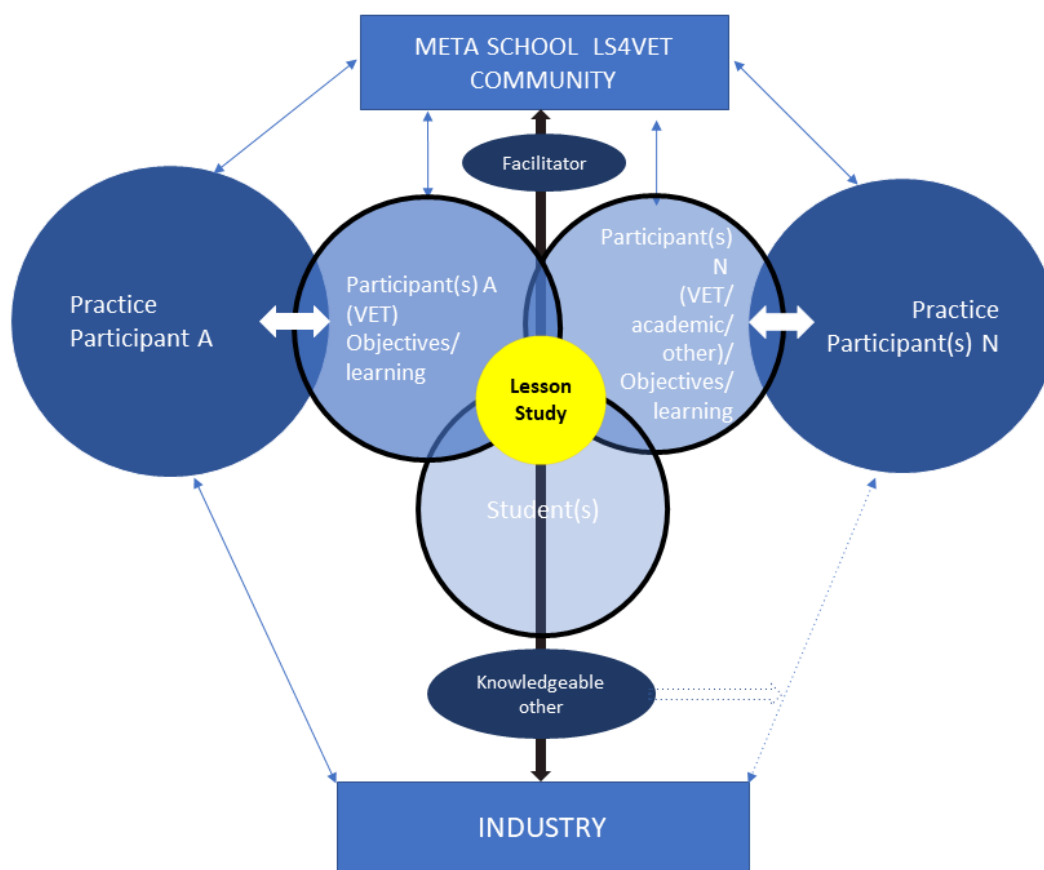
THE META SCHOOL LS4VET COMMUNITY: When LS4VET is first introduced to a VET school, only a few teachers could participate. A Meta school LS4VET community starts only when there are already more than one LS4VET teams in the school. This community does not only describe a clear vision for LS4VET, it also explains what LS should specifically deliver to teachers and students. The LS4VET Community establishes ground rules around facilitation, time, and resources as a whole although each LS4VET team already defines its own vision/ objectives and ground rules. Finally, the LS4VET Community establishes clear communication around all these topics inside and outside the LS4VET Community. At the end of the Lesson Study cycle, the findings are shared in the LS4VET community and are communicated outside the LS4VET Community.

The facilitator has a bridge function between LS itself and the LS4VET community. He/she is well aware of the vision, established by the LS4VET Meta School Community, knows what is needed around facilitation (knows the rules drawn up by the LS4VET meta school community in this regard) and ensures that the facilitation takes place. Given the complexity of the VET system (e.g. the heterogeneity of the teachers, the context of the profession and the intensified role of the student), it seems important to attract an insider who can fully focus on his/her task and therefore does not have a dual role.

The knowledgeable other fulfils (where possible) an important role between the LS and academia and industry. The knowledge that a knowledgeable other brings will always have to be seen in the light of VET pedagogy or the vocational domain. A knowledgeable other can be from industry, from the educational field or from both sites. An industrial expert can reflect on the industrial meaning of the pedagogical goals and findings, and by this role, he or she can modify e.g. the pedagogical plans of the research lesson. He or she could also bring practical as well as tacit knowledge to the LS. But since LS is primarily about student and teacher learning, an academic expert with up-to-date content knowledge and knowledge about VET pedagogy and didactics is highly recommended in LS4VET.

Industry has a special connection with LS. After all, the students' learning and—by extension—the curriculum (and the lesson as a central part of this) must be geared to the changing context of occupation/vocational domains. Therefore, within LS4VET, the industry could be integrated in the process.

THE PRACTICES OF PARTICIPANTS All participants bring their own practices to the Lesson Study. Each of the practices have their own rules (about designing and teaching), divisions of labour (roles of actors) and tools (learning materials, teaching formats etc.) and influence the way that participants conduct the Lesson Study. As mentioned before, these differences in practices can lead to opportunities of learning. Therefore, it is important to think carefully about composing LS4VET teams—when it comes to differences in practices—and inviting other actors (like knowledgeable others) to optimize the learning efficiency. Not only for the participants, but also for the professional contexts they come from. It is not only the team composition that is important for the learning efficiency and the extent to which pedagogy becomes adaptive. Attention is also needed for the team leaders. They have an important role in supporting the participants and in monitoring compliance with the agreements as they are drawn up in the LS4VET Community.

The participants are the 'brokers' between the practice and the Lesson Study. They bring their own rules, divisions of labour and tools and influence the way other participants conduct the Lesson Study. Participants therefore need the capability to cross boundaries and resolve contradictions with members of diverse practices. Participant A and Participant(s) N work and learn together through systematically analyzing students' learning and adapting their pedagogy. Participant A is ideally a VET-subject-teacher—to ensure the connection with the industry—and Participant(s) N is an (are) other participant(s) in the LS-cycle. Participant N:

- could be one or more teachers (also VET or Academic) from his/her team;
- or one or more teachers from a different teacher team, within or across the VET-institution, or from another VET-institution, or from the industry;
- could also be a knowledgeable other. This is only the case when a teacher chooses to individually go through the LS-cycle.

The student(s) in the LS4VET model, engagement of students is guaranteed; participants learn from the student's learning (n.b. how can they apply adaptive pedagogy in such a way that the student learns what he/she should learn) and vice versa. It's important to engage students in a systematic way through asking for their feedback about learning difficulties or barriers and through giving them feedback about their progress. When we look at the possibilities within the LS cycle for students to systematically give feedback, it is important to consider that teachers inevitably have far broader and more informed knowledge of subject content, didactics, and pedagogy than students.

1.4   STEP 1: ORGANIZE THE TEAM

In step 1 the facilitator organizes meetings with the LS4VET team aimed towards identifying a problem/interest/question for conducting a research lesson and for developing a work plan. And the LS4VET team and facilitator liaise with the LS meta school community and the school manager to present and discuss lesson study design**.**

In this chapter you will:

1. Organize the team

2. Get acquainted with setting up a collaboration within the school and outside the school with academia and industry.

1.4.1 ORGANIZE THE TEAM

The LS4VET team leader (can be teacher or school leader who will initiate LS implementation in VET school) needs to decide the LS4VET team size and composition and invite/involve supporting others to the LS4VET team.

LS4VET Team Size

LS4VET team is the group of VET educators making up the lesson study team. The optimal size for a typical LS team is three to six teachers. If your whole department or whole school plans to engage in LS4VET, it is recommended to break into teams of about three to six and plan for periodic meetings as a whole department or school.

LS4VET Team Composition

There are two types of typical LS team, single-subject and cross-subject teams. The single-subject team is a team who bring together teachers who teach the same subject so that they can deepen their knowledge of the standards, curriculum, and teaching strategies specific to that subject. Cross-subject team is a team in which teachers from several subject areas have genuine shared questions that are important across disciplines and collaborate to ask how they can improve students' learning.

Heterogeneity within vocational education and training is high. Heterogeneity is visible on different layers within education. Teacher teams are formed based on different logics in the different VET systems (e.g., subject departments and horizontal departments in Hungary, teacher teams with sub teams formed by sector and focus teams in the Netherlands). In organizing a team, it should be considered how this heterogeneity could be used to optimize learning from each other.

Inviting/ Involving contributing participants to LS4VET team

After organizing the LS4VET team, the team members need to discuss who can support and involve in the LS4VET team. Here are possible contributing participants to the LS4VET team.

- *LS4VET facilitator* – a person (inside or outside the VET school) knowledgeable in lesson study who leads the LS4VET team through the lesson study process and who may be part of the LS4VET team
- *Knowledgeable other (A)* – a person with an academic background who can support the LS4VET team mainly with pedagogical content knowledge
- *Knowledgeable other (I)* – a person from the industry or from the VET school with current industry experience who can support the LS4VET team mainly with VET content and its application
- *Students* – those learners in whose class this lesson study will be implemented
- *School manager* – the person leading the particular VET school
- *LS4VET meta school community* – a team that overlooks the whole lesson study process, maintains ongoing communication with the LS4VET facilitator and supports the LS4VET team when, how and where needed

1.4.2 LESSON STUDY AS CROSS-BOUNDARY COLLABORATION IN VET

One of the aims of LS in VET is to build on and take advantage of the special features of the VET context, such as collaboration with industry, diversity of teachers and students and teaching and learning environments. We call this **cross-boundary collaboration**. Within VET there is a specific opportunity to make targeted use of the knowledge, skills and experiences of all actors involved in LS, due to the heterogeneity of teachers, the collaboration with the work field, the universities and possibly the students, given their age and previous experiences. There are some examples of cross boundary collaboration in VET context:

There are 3 types of boundary crossings between the practices of VET and the industry (Andersson & Köpsén, 2019):

1. when VET teachers encounter the occupational practice through short visits to a workplace to meet an employee who is supervising a VET student, visiting the worksite, doing work in the original vocation, e.g. as a carpenter or chef, and using external contracts involving students in authentic work tasks OR maintaining relationships with the industry by participating in industry arrangements and courses, internet-based networking or student skills competition,

2. brokering of occupational knowledge (where the brokers who bring knowledge from their workplace learning periods, or representatives of the industry/suppliers who present their latest technology and products in the schools and expert professionals invited to the school),

3. reconstructing the occupational practice at school (e.g. by labs, hairdressing salons etc. in the school who do real production/services to the public).

Moreover, it is also a boundary crossing when vocational teachers attend formal VET teacher training (typically while they are already teaching) or within a VET school, when vocational and general subject teachers collaborate on some professional matter, such as LS.

Lesson study is the boundary object; the artefact that fulfils the bridging function. We see the great advantage that – when investments are made in optimizing the principle of boundary crossing in LS4VET– the 'learning' is broadly secured by all 'practices' involved. To strengthen the cooperation between teachers (and teams, institutions, universities, industry and education), it is – therefore - important to optimize the competencies that focus on boundary crossing and on the 'learning mechanism' of boundary crossing itself.

It is important to mention that attention should also be paid to the role of the knowledgeable other, who must have insight into subject content, as well as educational and field innovations and can build a bridge between them. This – even more so than in the lesson study as we know it now – plays an essential role in the success of a lesson study in VET.

In sum, through a LS4VET based on principles of boundary crossing:

- teachers can learn to collaborate, not only within their usual team but across teams and with stakeholders from industry
- teachers learn to become adaptive through reflection and engagement in inquiry, and potentially co-construct new teaching practices
- teachers broaden their horizons related to students' learning and their VET-pedagogy collaboration and outcomes of the LS could be more sustainable

1.5 STEP 1: PRE-STUDY FOR SETTING LS4VET GOAL

1.5.1 PRE-STUDIES FOR SETTING THE BIGGER GOAL

To find out what you want to investigate, you need a starting point. You can do this by approaching multiple sources in, and outside your school. In this way you investigate together what current themes you can focus on. You might already have an idea through the proud VET activity what you would like to work on. But you are going to make this more specific by questioning multiple sources. In any case, ask:

- literature/university/experts
- colleagues
- students
- industry
- and use your own expertise

1.5.2 SETTING THE BIGGER GOAL

Lesson study (LS) can be organized in individual schools, at regional, national or international level. Depending on the form of organization, the objectives of LS will differ. Individual schools usually orient their research focus on specific content, skills or areas of competence to be taught and promoted. Larger networks, on the other hand, generally have broader goals. Focal points can be subject-specific, have an interdisciplinary effect or lie in the area of interdisciplinary learning.

Examples of focal points/ research objectives

Subject-specific	Interdisciplinary Effect	Area of Interdisciplinary Learning
Recognize connections between certain mathematical operations and everyday life	Represent mathematical processes and results in everyday language	Clearly express and justify proposals for solutions and accept and value the ideas of others
Write non-fiction texts and achieve defined professional and linguistic gains in the process.	Illustrate and present texts written in project work	Allow classmates to have their voice and politely formulate and accept feedback
Know the connections between climate and natural disasters	Orally present concepts for improving the ecological condition of one's own living environment.	Develop ecological school spaces

If schools want to work on larger thematic areas, several lesson studies on a research focus can be carried out at different school levels.

In Japan, LS is also conducted at the national level by enthusiastic and highly experienced teachers. Their research lessons are usually shown in the context of large conferences. Often, current developments or new forms of teaching and learning are presented.

Together, teachers involved work on a common understanding of the subject matter, and theoretical foundations for learning are explored collaboratively. Each LS is therefore based on a shared understanding of a specific learning theory (Mewald, 2019).

1.6 RESEARCH LESSON DESIGN

With formulating your research lesson design you will be ready to implement the lesson study with the team and you will finalize module 1.

1.7 TASKS

1.7.1 VET LEARNING ACTIVITY TO BE PROUD OF GROUP WORK (FACE-TO-FACE DISCUSSION OR FORUM)

1. Individually fill in the form " VET learning activity to be proud of".[1]

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[1] VET learning activity that is challenging Course: SEC Hospitality

Class: Year 10

Date: 20/1/2023

What and why

What learning goal(s) did you have in mind regarding the topic of this activity?

Students must be able to understand cuts using knives and blades & correct upkeep, handling and storage of knives.

How does this activity relate to other activities in the curriculum? (Place of the activity in the curriculum) l.

While students were grasping on the concept of justifying the use of different cutting techniques and the skills required to demonstrate such cut, they were also being prepared for the coming Learning Outcomes related to food commodities and rework of food. Additionally, elements of healthy eating and food hygiene and safety were also referenced. Therefore, through this exercise, students did not only revise already covered material but also practised the necessary skills required in a kitchen environment.

What makes you proud of the activity? / Challenging aspect

Seeing students being engaged so much through a real life kitchen activity while working with professional chefs certainly raised interest. In addition, when students were asked to justify the use of each cut, students were able to look at the different cuts on the chopping board rather than on a paper. Furthermore, some of the cuts were used in the preparation of a stir-fry. Other cuts were used in the making of a soup. Another task was given in continuation with this lesson which helped students understand and justify the cuts in the preparation of different dishes. Here students came up with different ideas and they exhibited peer teaching through the presentation of their ideas.

Quite often a major challenge is having a more knowledgeable other who would be available for lesson delivery or to compliment the teacher's lesson delivery. Furthermore, another challenge experienced by students is the

pronunciation of the cuts. Also, students tend to find it challenging to actually carry out the different cuts demonstrated during this lesson.

Challenges and possibilities

Did the students need specific prior knowledge for the topic of this activity? If so, which ones?

Hygiene and safety were topics already established from the previous Learning Outcomes. The input by the chefs supported what had already been learnt. Students seemed to have realised that what had been already taught is actually valid and true.

What was successful for students in this activity? What did you notice about it?

As already explained, when students were asked questions about the different cuts and their uses as part of the recap for conclusion, they were able to see the actual cut on a chopping board rather than on a paper. This made a difference in that their input in answering questions seemed to be higher compared to previous lessons. Also, all students seemed to try answering questions rather than the usual two students. Seeing students who usually give in to demanding questions is certainly rewarding for us as educators. Therefore, this is something which we plan to collaborate upon in the coming years.

What difficulties did you encounter with students? How and when did you find this out? To what extent had you anticipated these difficulties?

The class setup was one of the major challenges in this activity. should this have been in a 'fishbone' style, students would have been in a better position to follow the demonstration accordingly. This was experienced, as the two chefs had to split the class in half and did the demonstration separately (with the group of students they had).

Teaching approach

What activities did your students perform in this activity? Why did you choose just these activities? What had you prepared, and what happened spontaneously?

Students are given a booklet with the relevant notes in link with the lesson. Given the nature of this lesson, which is rather theoretical, it was developed through a hands-on approach to ensure the nature of VET- i.e. bringing theory to life- was kept central during delivery. An A3 poster (printed in colour) was distributed to students so that they took a quick reference with them back home. In order to compliment and show their understanding of this topic, students were given a task for homework to find different recipes where the different cuts were used. Then, they had to present their ideas to their peers. It was felt that by combining a hands-on activity of practical nature with the help of the professional chefs, bringing together a discussion while students, in return, had to research recipes for homework seemed to have been successful in that their level of understanding was higher.

What was your main part as a teacher in this activity?

This was an activity led by two professional chefs and a classroom teacher in a secondary school setting. The lesson took place with a group of seven students aged 14/15. The chefs had the role of showing the cutting techniques as well as the cooking workshops while the teacher was incharge of the lesson planning while asking questions to encourage students to address difficulties or ask questions directly to the chefs as more knowledgeable others.

Learner outcomes

Did your students achieve the goals of the activity? How do you know (what clues did you have to this)?

2. Organize exchange in groups of 3 or 4: each briefly (Max 2 min): What is the content of the activity? Why proud of it? What makes the activity good?

Using a concept map, take stock of what a good lesson looks like. What are the ingredients of a good activity in VET? What do you need for it? Examples of questions you can use to support teachers in creating the concept map:

- What are the goals of the lesson?
- Who are your students? What influences them?
- What are the students doing?
- What does the teacher do?
- What is the role of industry or knowledge from industry?
- What materials do you use? Are they authentic?
- What is most important in your lesson?
- What VET pedagogy principles lie beneath your lesson design?

You can vary in work format depending on the size and/or composition of the team by first having them write down terms individually and silently and then after about 5 minutes having them discuss them. Alternative is the placemat method, where everyone does a brainstorm, and they discuss afterwards.

3. Plenary, answer these questions: What makes a good VET learning activity? How can a lesson study contribute to baking this VET learning activity better? Hold on to these thoughts. They will help you to set the bigger goal for your lesson study in chapter 4

Following this lesson, students have used the cutting techniques in multiple practical tasks they had. Therefore, it has become evident that they have understood the concepts related to the cutting techniques shown and exercised during this lesson.

Were there any learning outcomes that you did not expect? How do you know (what clues did you have to this)?

N/A

Teacher learning outcomes

What would you do the same next time in this activity on this topic and what would you change? Why?

It could easily be implemented in a similar way with the only difference of setting up the class in a different layout.

What insights did you get from (giving) the activity?

(e.g. in the form of a rule of thumb: if X, then Y)

To what extent are these insights also relevant for other contexts (different class, different level)?

Students seemed to have understood the cutting techniques as in their presentation of the recipes researched about each cut reflected what they had learnt.

1.7.2 INDIVIDUALLY: WATCH VIDEO PRESENTATION FOR LS4VET MODEL

1.7.3 GROUP WORK (FORUM, F2F OR HYBRID)

Recap the issues discussed in task 1.7.1. What were you proud of and what can be improved for better VET education?

Set up a possible LS4VET team which can work on the issues identified through a lesson study. Fill in this document and answer the questions in the document regarding the team composition.

Formulate the team members and their role

Team member name	Team member role	Contact information
Kevin Ellul	Knowledgeable other	kevin.ellul@its.edu.mt
Ronald Briffa	Observer	ronald.briffa@its.edu.mt
Ruben Dimech	Teacher	diemchruben@gmail.com

consider and discuss the following, first with your colleagues and then with your school leaders:

Who is the responsible person in the school management responsible for liaising with the LS4VET team?	Ruben communicated with the Head of School for permissions.
Who is the person responsible in the LS4VET team responsible for liaising with the school management?	Ruben
How does the work of the new LS4VET team fit into the school's organization and long-term pedagogical development plan?	Sharing of pedagogical ideas for future delivery of lessons.
What possible changes to teachers' working arrangements (timetables, workload) does the LS4VET team require for its activities, and how can this be secured by the school management?	NIL
What resources (materials, funds, venue) and other technical, logistical or professional support is needed for the LS4VET team's activities?	In our case, since we required different food items for this lesson to be realised, funds were forked out of the school's budget.
Can the teachers' participation in LS4VET be credited in any ways and, if so, under what conditions and how (by what rewards; e.g. by counting it towards the completion of their mandatory professional development)?	Certification
Does the LS4VET team plan any activities for which the presence of school staff other than the members of the LS4VET team is envisaged, or does it plan to invite teachers	No

and professionals from other institutions (e.g. to the research lesson)?	
How does the LS4VET team plan to make the results available at school level or beyond?	Presentation

1.7.4   TASK

Write down individually 2 possible cross-boundary collaboration activities (within or outside your VET school) which could improve quality of your VET pedagogy (which you formulated in the "activity to be proud of" (2.1)

Group work

Discuss and share your individual ideas cross-boundary collaboration activities (within and outside VET schools) which could improve the quality of your VET pedagogy.

And decide WHO from industry, from your school and/or from university can be involved in the lesson study team. And write down their role (participant/knowledgeable other/participant).

Complete the above form with adding possible cross collaboration members to the table.

Contact the members.

1.7.5   TASK

Group work (online, f2f or hybrid) and individual work

Conduct the pre-studies.

Start by asking the following question:

What are current challenges regarding student learning in VET/school/industry?

To the following persons/sources:

literature/university/experts, colleagues, students, industry

And keep on asking to find out what possible new goals for the lesson study could be.

Make a division, who does what and how this is reported in the next meeting (it is advisable to agree on this an how to work together in the study alone and together document)?

Work together in the study together and alone document:

LS team members			
Literature/ **Experts**			

Manuel Fenech	*Benefits and challenges of lesson study: A case of teaching Physical Sciences in South Africa*	*Summarize the most important finding*	*How can we use this for the research lesson?*
	file:///C:/Users/schools_ho me/Downloads/OgegboGaig her2019.pdf		
Colleagues			
What is your name?	*Who did you speak to?*	*Summarize the most important finding*	*How can we use this for the research lesson?*
Students			
What is your name?	*Who did you speak to?*	*Summarize the most important finding*	*How can we use this for the research lesson?*
Industry			
What is your name?	*Who did you speak to?*	*Summarize the most important finding*	*How can we use this for the research lesson?*
Own experience			
What is your name?	*What is the subject?*	*Summarize the most important finding*	*How can we use this for the research lesson?*

1.7.6 TASK

Group work (online/forum/f2f/hybrid)

- Gather all the information from the pre-studies
- Filter the most important challenges
- Agree on the bigger goal of the lesson study

Complete the following form and formulate a START research lesson goal:

Initial Goal (Write the goal you have in mind: Can be subject-specific OR interdisciplinary effect OR lie in the area of interdisciplinary)

1. Specific (What do you want to accomplish? Who needs to be included? When do you want to do this? Why is this a goal?)

2. Measurable (How can you measure progress and know if you've successfully met your goal?)

3. Achievable (Do you have the skills required to achieve the goal? If not, can you obtain them? What is the motivation for this goal? Is the amount of effort required on par with what the goal will achieve?

4. Relevant (Why setting this goal now? Is it aligned with overall objectives?):

5. Time-bound (What's the deadline and is it realistic?):

Research Goal (Review what you have written, and craft a new goal statement based on what the answers to the questions above have revealed):

Extra resource: Examples of some research lesson goals: https://lessonresearch.net/wp-content/uploads/2018/03/Examples-of-Research-Themes-1.pdf

1.7.7 TASK

Individual work

Description of the assignment: create a Lesson Study design in the context of their own VET:

    a) in alignment with selected research lesson bigger goal

    b) in collaboration with education/university and/or industry

    c) with learners as active participants

Content of the Research Lesson Design:

- Smart formulated bigger goal and justification of this bigger goal
- Team composition, justification for this team composition and how this is in line with the LS4VET model
- Illustration of how you plan to collaborate with education/and university and/or industry and how this contributes to cross boundary collaboration
- Illustration of how you are planning to involve students as active participants in the lesson study

- A completed LS4VET Team Protocol Template[2]

Form of the assignment:

The form is free of choice, options are for example:

- Video
- Powerpoint presentation
- Flyer
- Essay

Submission: the completed template on Moodle

Submission

At the end of Module 1 (After 3 weeks)

1.8 BIBLIOGRAPHY

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Pertama, E. (2017). Designing Instructional Materials. Untad Press.

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[2] Worksheet: LS4VET Team Protocol

Describe below what you think is important in your team to make working together as pleasant and productive as possible.

As a team, we are going to;

2. LS4VET IMPLEMENTATION – FOCUS ON PROCESS

2.1 DESCRIPTION OF THE MODULE

2.1.1 AIM

Successful Lesson Study is a collaborative act with all members participating on equal terms. Therefore, Module 2 engages course participants in planning and implementing Lesson Study research lessons collaboratively. At the end of this module, you will have implemented Lesson Study research lessons and observation- as well as interview-/feedback-schedules. Moreover, you will have held post-lesson discussion meetings to create Lesson Study research lesson revisions based on evidence and team consent taking a responsive approach towards the participation of VET students in Lesson Study and learning.

2.1.2 ENTRY REQUIREMENTS

Completion of Module 1.

2.1.3 CONTENT

- Lesson Study research lesson design
- Observation and student voice in Lesson Study
- Dialogic reflection in Lesson Study
- Revising Lesson Study research lessons
- Lesson Study reports

2.1.4 GOALS

The participants…

- are able to develop Lesson Study research lessons in alignment with pre-study research findings, including the exploration of learner needs and interests.
- are able to develop and implement observation- and interview-/feedback-schedules in alignment with the objectives/questions of Lesson Study research lessons.
- are able to use findings from Lesson Study to identify and create new learning opportunities.
- are able to integrate their findings into descriptive Lesson Study reports.

2.1.5 LEARNING OUTCOMES

The participants…

1. create Lesson Study research lesson plans.

2. develop observation- and interview-/feedback-schedules.

3. implement Lesson Study research lessons in two cycles (one in pilot #1).

4. discuss observed learning and learner feedback.

5. create revisions of initial Lesson Study research lesson plans.

6. write descriptive Lesson Study reports.

2.1.6 ASSESSMENT

Successful completion of the module requires:

1. active participation in e-learning and completion of course tasks (individual and group work, 50%)

2. three compulsory portfolio entries summarised in a collaborative Lesson Study report including

   a) goals,

   b) observed performances and results from interviews/feedback (group work, max. 500 words), and

   c) summary of findings (group work, max. 500 words, 40%)

3. One optional component demonstrating any other outcomes from the Lesson Study (individual work, approx. 200 words, 10%)

Assessment is based on a 4.0 criterion-oriented scale (see Appendix).

2.1.7 DURATION OF MODULE, ESTIMATED WORKLOAD AND MODE OF DELIVERY

6 weeks, 2 ECTS

40% e-learning and self-study, 40% digital face-to-face collaboration, 20% analog or blended face-to-face collaboration

2.1.8 MODULE PROFILE

Module 2 has four sections:

1. Planning Lesson Study research lessons

2. Observation and interviews

3. Post-lesson discussions

4. Reporting

Each section has compulsory and optional tasks and templates to guide your learning. Any optional task or template can be omitted or replaced by activities and materials you find more appropriate in your context. However, the way the module has been designed, its components will lead to a report that can be accumulated from the work already done. If you decide on an individual approach, your report may look different from the one presented at the end of this module. Any personalised outcome will be accepted as long as it fulfils the module requirements described in the Appendix.

Task	Type	Forum entry	Content
1	compulsory		LSRL-design
2	compulsory	x	Objectives
I	*optional*		*Explore LSRLS (plans)*
3	compulsory		Objectives
II	optional		*Explore backward design*
4	compulsory		Lesson plan
III	*optional*	*x*	*Forum - feedback*
IV	*optional*	*x*	*Forum - feedback*
V	*optional*	*x*	*Forum - feedback*
5	compulsory		Observation schedule
6	compulsory		Interview schedule
7	compulsory		LSRL implementation, observation, interviews, discussion
8	compulsory		Reflection
VI	*optional*	*x*	*Forum — collaborative discussion*
VII	*optional*		*Explore reports*
9	compulsory		Report

At the end of the Module 2 you will submit a portfolio which consists of the following four entries:

1. a description of the goal(s) of your LS and the learning objectives of your LSRL,

2. a brief summary of the observed performances and results from interviews/feedback, and

3. a summary of findings/changes to the LSRL. This part will be done as group work and should not exceed 500 words.

4. **one optional task** which should demonstrate any other outcome from the Lesson Study. This part is individual work and should be approx. 200 words long.

The submission of the portfolio will be expected at the end of week 6 in one pdf document for each LS4VET-team.

2.2 LESSON STUDY RESEARCH LESSON DESIGN

2.2.1 INTRODUCTION

Welcome to Module 2 and the practical implementation of a Lesson Study research lesson (LSRL)!

This module is comprehensive, and it will take six weeks to familiarise you with four topics:

- planning your LSRL, implementing the LSRL in one class,
- observing and interviewing students,
- holding post-lesson discussions and revising the LSRL, and
- reporting about your experience.

You may already be familiar with some of the content we are presenting here. Please consider any input as an offer to reach the big goal — your learning about Lesson Study — and feel free to take a self-directed path through the module.

As you already know, Lesson Study (LS) is a form of collaborative classroom research. Its origins are to be found in Japanese primary schools, where it is called *jugyō kenkyū*. In vocational education and training (VET), it draws on the LS4VET Model, specifically designed for the VET sector, which you were introduced to in Module 1.

Module 2 concentrates on planning a LS research lesson (LSRL), its implementation and observation, the collaboration with students in the inquiry about their learning prior to, during, and after the LSRL, and the adaptation of the LSRL as an outcome of collaborative analysis and reflection in at least two cycles (one cycle in pilot #1).

At the heart of any LSRL is student learning, which should be developed as effectively as possible through the collaboration of a team of teachers supported by knowledgeable others and/or LS facilitators: the LS-team. A LSRL integrates students in LS: Through their actions in learning and their feedback on learning, students are directly and indirectly involved — not just in the lesson but also in the research process. Feedback about learning gained through observation, interviews, and the assessment of learning outcomes (performances, artefacts etc.) enables the LS-team to change the learning opportunities in a LSRL in a meaningful way. Therefore, student behaviour, performance, and feedback are key elements of the LSRL development process.

In designing a LSRL, a LS-team collaborates on a plan for a lesson/unit or a teaching sequence/project. Each LSRL-plan is dedicated to at least one specific aspect of learning which has been identified and studied in the first two steps of the LS (see Steps 1 and 2 of the LS4VET Storyboard). Moreover, the LSRL-plan is aligned with the LS-design (see Module 1) so that the LS-team can find answers to the negotiated LS-research question(s) and/or interest.

Learning objectives and expected learning outcomes as well as their assessment are discussed in the LS-team, teaching ideas are collected, and collaborative planning is done in online or offline meetings. Moreover, the LS-team develops observation- and interview-schedules to be used during and after the LSRL. It stores, exchanges, and analyses the data collected and finally adapts the LSRL for a new cycle based on their reflections as well as the perceived needs of a new group of students.

Finally, the data collected are collated in a descriptive LS-report.

2.2.2   LET'S GET STARTED

No matter how large or small a LS-design (see Module 1) may be, the teachers involved can always invite experts for collaborative work at any time. These knowledgeable others support the LS-teams in their planning and, if necessary, also in the facilitation of the LS-process, the implementation of LSRLs, as well as in the analysis of observation- and interview-data. They contribute to the LS-teamwork with their specific expertise wherever the team considers it important (Mewald, 2020a; Takahashi, 2013) (See Reader). Together, the LS-team members and the knowledgeable others work on a common understanding of the subject matter and/or in possible aspects of the methodological parts of the lesson. Moreover, the theoretical foundations for learning are explored collaboratively. Each LSRL is therefore based on a shared understanding of a specific learning theory and/or method (see Module 1).

2.2.3   THE BIG GOAL AND LEARNING OBJECTIVES

The design of a LSRL is based on two points of orientation: the curricular requirements and the specific learning needs of the group of students. The big goal of a LS, which is framed by research questions and/or interest (see Module 1), guides both orientations. Planning focuses on the selection of specific learning objectives which reflect the real-world aspects of the big goal and the learning needs of a specific group of learners. Learning objectives are seen as milestones on the students' way to the big goal and formulated as can-do descriptors. At the starting point, you write up the *core objectives*, which describe the learning outcomes that are to be achieved by most learners and which correspond with curricular expectations. Additionally, you formulate objectives that will be achieved on the way to reaching the core objective, the *simpler objectives*, and also the objectives that would represent fulfilment beyond the core, the *more complex objectives*.

This differentiation is useful because a clear representation of the anticipated learning process and outcomes is helpful in planning and in the development of observation schedules. For the purpose of observation, the description of the objectives may be personalised in the light of selected case students to be observed. Moreover, the verbal description of success criteria for the fulfilment of learning outcomes at various levels may also be helpful (esp. in situations where grades should or must be assigned). *Figure 1* is a visual representation of this planning process.
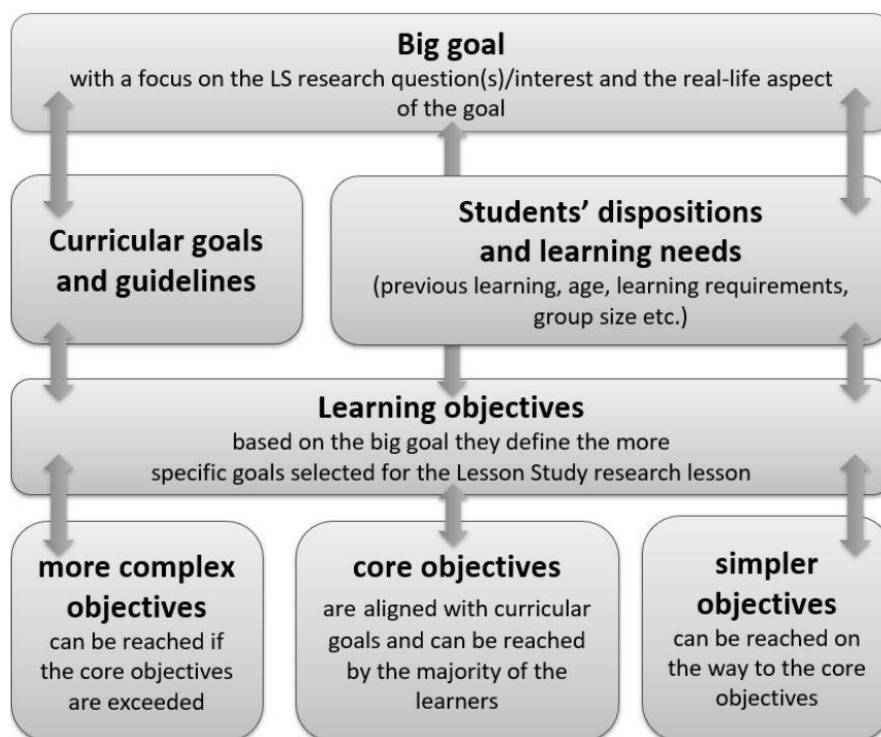
Figure 1:
The big goal and learning objectives in LS4VET LSRL-design (See bigger image) ©Claudia Mewald

As soon as the theme/topic for the LSRL has been selected, the competences that are or will be significant in the learners' private, educational, or professional lives can be described in connection with knowledge, skills, functions, or strategies to be acquired. At the beginning of planning, the focus is always on the *core objectives* (also see LINK).

You may already have a clear idea what a lesson plan should look like and have been using a template of your choice. If your LS-team feels that their own template is the best possible one for their subject, it should be used in the LS-project.

Our example (adapted from Mewald, 2014) suggests four phases: *Contextualisation (c), Focussing (F), Practice (P)*, and *Use (U)*.

For more information about C-F-P-U, read this text.

There are many formats for planning lessons. However, most lesson plans contain some or all of the above-described phases even if they are using different names. While the typical order in our example is C-F-P-U, the components can be sequenced in many ways, depending on the goal and the situation.

Follow-up lessons, for example, may employ a different order. Moreover, individual phases may be used separately and even split into smaller parts to suit the LSRL goals.

2.3   OBSERVATION AND INTERVIEWING IN LESSON STUDY

2.3.1   INTRODUCTION TO OBSERVATION IN LS

In the professional development of educators, reflective action in Schön's (1983) understanding of the *Reflective Practitioner* engages teachers in constantly striving to learn more about their own educational work, to become

better acquainted with the processes of teaching and learning, to experience professional actions more consciously, and to understand themselves and others better (Elliott, 2007; Mewald, 2005, 2019; Schön, 1983).

The link between teaching and learning is complex and fascinating, and most teachers have probably encountered the dichotomy of the two processes: While teaching, they become learners themselves. Often, students become the information-carriers for the learning process of their teachers; in some cases, the learners even become "the teachers".

"Teaching and learning are no longer exclusive roles; they become the provinces of both performances in the classroom: while the teacher instructs, the teacher learns about what must be done next, and while the learner learns, the student gives instruction about what information is lacking." (Zamel, 1981, p. 149)

Zamel describes what usually happens unconsciously in the classroom and what experienced teachers seem to accomplish effortlessly. If the parallel processes of teaching and learning are to be revealed in order to promote professional development through reflection and awareness (If you are not yet experienced in reflecting on your own work, you may wish to read about this topic in 2.4.2 before you carry on), or to provide concrete information for the development of a research interest, it must be observed and described systematically and purposefully.

In LS, observers take a non-participatory role. Depending on the LS interest and the intention of the observation, open or structured approaches can be used. Regardless of the way they are conducted, observations in LS are always based on purposeful, adequate, and carefully selected methods of collecting and documenting information about student learning that eventually become the basis for triangulations, analyses, and interpretations (Mewald & Prenner, 2020).

In LS, observation is an important component of the decision-making process to adapt the LSRL. However, it is not the only one. LSRLs are reflected, adapted, and re-implemented as a result of a collaborative discourse on the planned and experienced learning in cyclical processes. In addition to observation, learners provide important feedback for the LS-team, who adapt their planning and actions to actual learning experiences and identify successful new learning opportunities to avoid barriers for learning. Discourse with learners is therefore sought from the very beginning of planning a LSRL. Learners may be asked about their prior learning and experience in the planned topic area: VET students may already have gained knowledge or skills in the workplace or during internships, or they may anticipate learning barriers from prior experience. Moreover, learners' voices are heard by asking them about their learning experiences during or immediately after learning sequences (e.g., through think-aloud, interviews, questionnaires, etc.). Thus, the role of feedback in LSRLs is two-directional and feedback is given and received by students and teachers alike. Prior to learning, "Feed-up" helps the students understand the difference between their actual learning status and the target goal of the lesson through the information the teacher gives about the learning opportunities that are offered and the learning goals to be accomplished. "Feed-back" is the comparison of the observed performances with the anticipated learning outcomes. On the one hand, feedback provides information to students about what has been accomplished relative to the LSRL-objectives. On the other hand, student feedback about their learning experience informs the LSRL-team about what might be changed in the LSRL-plan to create more effective learning opportunities. For teachers and learners, the discovery of the learning gaps is thus relevant in guiding future teaching and learning. "Feed-forward", as the explanation of the (new) target goal(s) based on the observed learning gaps, provides information to the students about new learning challenges, adaptive self-regulation over the learning process, personalised strategies in accomplishing activities, or more details about what needs to be understood in the future. Student feedback taken seriously is part of the teachers' decision-making process about what the forward-looking changes should be like. Discourse about the latter is motivating for the students and it helps create ownership of learning (Mewald 2020b).

If you want to read more about observation, go to Reader.

In Task 2, you have already thought about objectives and anticipated performances of three students.

In a next step, you will think about observations that can be connected with concrete situations in your LSRL in Task 3. If you are new to observation, try not to get too intensively involved in structured observation. Rather, plan for possibilities to capture what is actually happening in class and what the student/s is/are (not) doing.

This module does not focus on data analysis, but it was mentioned at the beginning that data from observations are hardly ever the only basis for analysis and interpretation. Instead, observations are constantly supplemented with information from other sources (team discussions, documents, notes, interviews etc.) through collaborative discourse in order to increase the quality of the decisions you make as a LS-team.

While in many other cases observations are the sole source of information, LS pays great importance to "student voice" as additional sources for interpretation. Interviews with students are therefore conducted to do justice to the complexity of the learning processes and to complement the experience and perception of the LS-team with that of the learners.

2.3.2   INTERVIEW IN LS

Learning is a very complex phenomenon. LS therefore looks at learning from as many perspectives as possible, using a variety of sources to get to the bottom of learning. The information that can be gathered personally from learners is an important component of *student voice* and the interview as a form of inquiry about learning is therefore an indispensable source for the LS-team.

In LS, observations are often supplemented by interviews to bring the observation results closer to the students' perception of the situation. While observations allow for the possibility of "immersion" in the situation, the observers' perspectives will still selectively and interpretively influence the interpretations of what they "saw". To address these and other shortcomings, LS-teams seek to gather additional information from learners directly involved in the LS.

However, the reasons for taking interviews goes far beyond the effort to detect possible observational errors. Interviews may help uncover the reasons for externally visible and observable behaviour. These include, for example:

1.   impressions, feelings, thoughts, and intentions,

2.   the use of strategies in learning,

3.   causes of behaviour influenced by past experiences or peer-group influence,

4.   attitudes, values, concepts of the students, etc.

These and many other phenomena cannot be observed. A good way to gather information about them is to ask because *"The purpose of interviewing [...] is to allow us to enter one person's perspective." (Patton, 1990, p. 158)*

Of course, it can be argued that learners' impressions, perceptions, feelings, and experiences do not necessarily correspond to "adult reality" and that conversations with students are merely further subjective building blocks in the construction of subjective interpretations. This argument must be countered by the fact that every interview of individuals allows for personal interpretations and that absolutely objective measurements, as they are possible in some areas of natural science, are hardly to be found in education. Moreover, we need to acknowledge that the learners' reality is relevant in investigating their learning and in adapting the LSRL.

As misunderstandings, prejudices, or misinterpretations are potential confounding factors, considering the learners' reality is particularly important when preparing, conducting, and analysing interviews with students.

For both, experienced researchers as well as beginners in the field of interviewing, it is advisable to follow the classic interview forms and avoid frequent difficulties and pitfalls in advance.

If you want to read more about interview techniques, go to Reader.

2.4 DIALOGIC REFLECTION TO REVISE LESSON STUDY RESEARCH LESSONS

2.4.1 INTRODUCTION

In LS, the participating teachers engage in dialogic reflection as an effective means to analyse and revise LSRLs. This process helps improve their students' learning and at the same time it supports the teachers' learning and professional development. Their dialogue helps them look at the LSRLs and learning from multiple perspectives: They identify the strengths and weaknesses of the learning opportunities the LSRL provides and generate new understandings of teaching and learning through collaborative analysis.

Post-lesson discussions offer various approaches to reflection which moves teachers beyond mere reporting about their observations and interviewing. The teachers' dialogic qualities depend on supportive conditions to conduct dialogic reflection, i.e., support which is usually provided by knowledgeable others or LS-facilitators.

2.4.2 FROM REFLECTION TO REVISION

Based on their work with student teachers, Bain et al. (2002) suggest five steps to reflect on learning and teaching through journal writing and Chung (2021) identifies eleven factors contributing to the effectiveness of dialogic reflection.

The two systems can serve as cornerstones in the dialogic development of LSRL revisions. Moreover, they can lead the LS-team from mere description to collaborative reflection:

1. In the phase of *reporting*, the LS-team engages in individual descriptions of their observations with first attempts to compare and contrast simple facts gained from LSRL observations in self-reflection and professional exchange as a team.

2. *Responding* to the experience of observations and interviews uncovers the participants' feelings and thoughts about the LSRL. It raises potential questions the LS-team might be able to answer in a more comprehensive and complex way than the individual alone. Responding adopts multiple pathways in the dialogue about the LSRL and it includes the exploration of the students' experiences and beliefs about their learning. This phase is the first explicit effort to make sense of what has been experienced as a professional team.

3. As the LS-team members co-construct understanding about successful and unsuccessful learning and *relate* their new findings to knowledge and skills they already have, they create a meaningful link to a shared knowledge base, which is empowering because it connects new experiences and creates common ground.

4. In a next step, the LS-team members *integrate* their new ideas in reasoning about theories and methods which might help explain the experience.

5. Relating the teachers' personal response to theoretical constructs thus creates new concepts which help to *reconstruct* their understanding of the learning process and revise the LSRL-plan accordingly. (See Template LSRL-reflection and Figure 2)
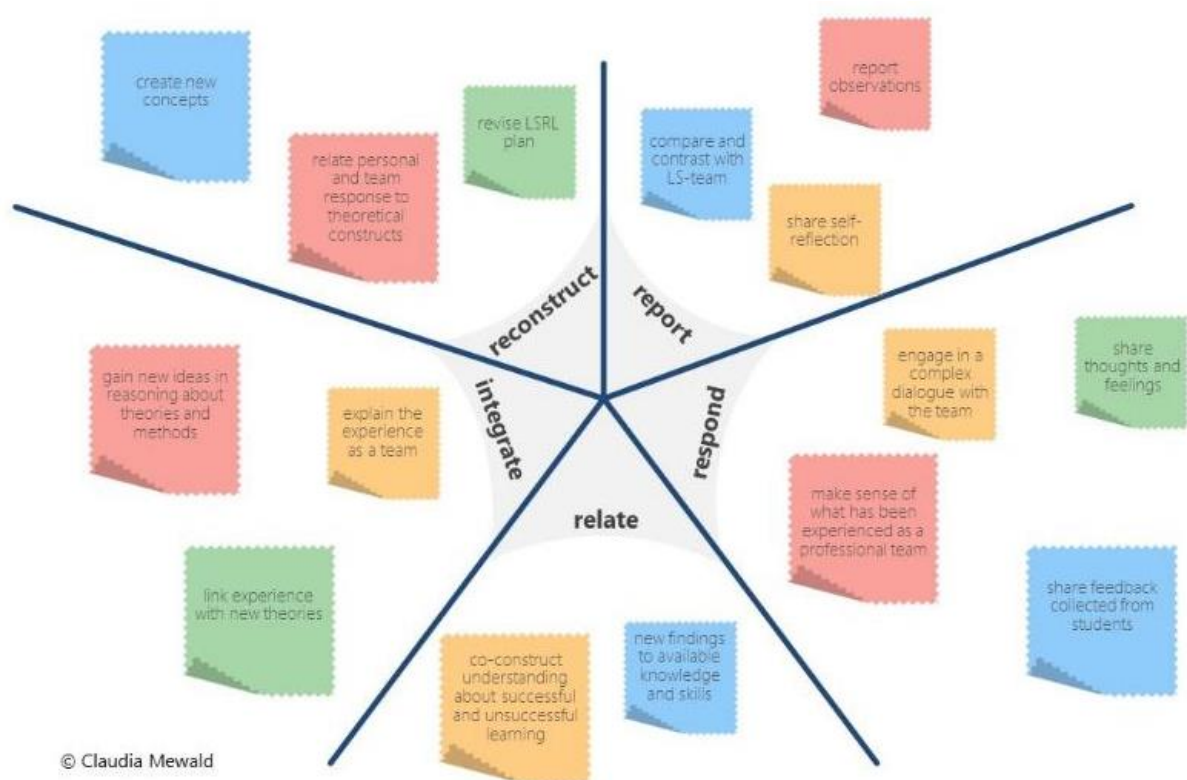
Figure 2: The 5 R in LS4VET LSRL-reflection and revision (See bigger image) ©Claudia Mewald

Thus, the revision of the LSRL is based on

- a descriptive report about the lesson and its successful and unsuccessful attempts to provide good learning,
- a collaborative response to the observations including the feelings and thoughts of all participants including the students' feedback about their learning,
- a co-construction of new perspective through relating their response to already available knowledge and skills, and
- your reasoning of findings in the light of theories and methods facilitated by the knowledgeable other(s).
- Finally, the previous four steps conclude in the revision in the LSRL in a phase of reconstruction.

2.5   LESSON STUDY REPORTS

Sharing LS experiences is an important part of LS dissemination, which is discussed in more detail in Module 3.

A descriptive LS report is the starting point for this process. It is created by compiling in a structured way the LSRL planning, implementation, and revision documents that teachers have already produced. In other words, they draw on texts that have already been written to collate information about work that has already been done. The LSRL report provides information on all the important points of a LS: the research question or interest and topic, the learning objectives, the student group and the LS team, and the learning outcomes.

Our example derives from the first piloting of this e-learning course. It uses templates provided in this course and may look different if teachers use alternative methods of documentation. The contents, however, will stay the same.

Lesson Study Report

Title and General Objective/Research Question:			
Regular Expressions in Programming			
Identifying simple regular expressions by explorative learning			

Learning Objectives (competencies, functions, abilities, strategies):			
(1) Identify simple regular expressions by means of interactive explorative learning methods, (2) generate word sets out of regular expressions, (3) generate regular expressions autonomously.			

Lesson Study Team: *Wolfgang Schermann, HTL Wr. Neustadt* *Harald Haberstroh, HTL Wr. Neustadt* *Claudia Mewald, PH NÖ*		Observers/Interviewers: *Claudia Mewald, PH NÖ, Michael Krebs, HTL Wr. Neustadt*	
Teacher: *Alexander Wöhrer, HTL Wr. Neustadt*		Reflection (Date, persons involved, material): *Above-mentioned persons were present 20 June 2022 from 15.10 onwards* *Instrument of documentation used: minutes/protocol, audio recording*	
Version: *1*	Date: *20.6.22, 14:20 – 15:10*	Location: *HTL Wr. Neustadt, 2BHIF*	Context: *2nd form/10th grade, typically 15 to 16 years of age, 20 students present*

Figure 3: LSRL Report Part 1 (see larger image)

This LSRL report represents the completion of an LS in an Austrian technical secondary school after the first cycle.

It mentions the title and the big goal of the LSRL, the three teachers and two knowledgeable others who originally developed the LSRL plan (see Figure 3). It also shows that one teacher from the LS-team conducted the lesson with a group of students. In order to produce this report, two reflection meetings were held online after the lesson.

Starting competence			
Class	Learner A can	Learner B can	Learner C can
Students know how to hard-code a pattern processing 2nd class (low degree of flexibility) in a programming language such as C++.	hard-code simple patterns autonomously.	hard-code patterns if a description of the pattern is provided.	analyse simple patterns if description is provided. They cannot, however, hard-code independently as errors are not recognised.

Figure 4: LSRL Report Part 2 (see larger image)

The next section of the report deals with the students' initial competence. The general description reflects the curriculum requirements and the specific learning conditions of the group of students. The class teacher provided the descriptions of the initial competences of three case students: Learner A, B, and C. This is relevant information for any external team member joining the LS-team, e.g., a knowledgeable other (see Figure 4).

Target competence (anticipated)			
Class	Learner A can	Learner B can	Learner C can
Students can (1) identify typical uses of simple regular expressions by means of interactive explorative learning methods, (2) generate word sets out of regular expression, (3) generate regular expressions autonomously.	(1) identify all typical uses of simple regular expressions by means of interactive explorative learning methods, (2) generate word sets out of more complex regular expressions, (3) generate complex regular expressions autonomously.	(1) identify some typical uses of simple regular expressions by means of interactive explorative learning methods, (2) generate word sets out of simple regular expressions, (3) generate simple regular expressions autonomously.	(1) identify a small number of typical uses of simple regular expressions by means of interactive explorative learning methods, (2) generate word sets out of simple regular expressions if support is provided, (3) generate simple regular expressions autonomously if supported accordingly.

Figure 5: LSRL Report Part 3 (see larger image)

The LS-team had negotiated learning objectives during the planning phase of the LSRL. These objectives formed the starting point for the next section of the report (see Fig. 5).

The general section states the target for the class. Learner B is expected to achieve this target, learner A is expected to exceed it, and learner C is expected to be able to form only simple regular expressions with help.

Based on the first three parts of this report, the LS-team had developed a detailed lesson plan as well as observation and interview schedules based on the expected performances and learning behaviour.

After the LSRL, the LS-team discussed the observed performances and added summaries of their observations to the report (see Fig. 6).

Target performance (anticipated)			
Class	Learner A can	Learner B can	Learner C can
Students can identify typical uses of regular expressions in data processing, data bases and command line by interactive explorative learning. They can form 3 to 5 word sets out of regular expressions. They can form 3 to 5 regular expressions autonomously.	• identify all typical uses of regular expressions in data processing, data bases and command line by interactive explorative learning. • form 5 word sets out of regular expressions. • form 5 regular expressions autonomously.	• identify some typical uses of regular expressions in data processing, data bases and command line by interactive explorative learning. • can form 3 to 4 word sets out of regular expressions. • can form 3 to 4 regular expressions autonomously.	• identify few typical uses of regular expressions in data processing, data bases and command line by interactive explorative learning. • form 1 to 2 word sets out of regular expressions. • form 1 to 2 regular expressions autonomously.
Observed performance			
Class	Learner A	Learner B	Learner C
Class appeared very concentrated and committed. Intensive notetaking (e. g. Cheat sheet)	generated cheat sheet with metasign exception such as \D or \S or \W. generated all regular expressions at good quality level, i. e. including special cases.	generated cheat sheet without metasign exception such as as \D or \S or \W. generated one regular expression autonomously.	generated cheat sheet without metasign exception such as as \D or \S or \W. generated one regular expression autonomously.

Figure 6: LSRL Report Part 4 (see larger image)

Finally, the team proposed changes to be implemented in another version of the LSRL plan (see Fig. 7).

> Necessary changes: *Authoring the cheat sheet was popular task with the students. However, it required considerable time. Will be replaced by a hybrid of prepared cheat sheet for elaboration to save time OR by a completed cheat sheet, as the teaching time was/is limited to one lesson only.*
>
> Annotation: Students were extremely cooperative and conscious of their responsibility, i, e., to help improve vocational teaching. They even seemed to feel proud to be involved. This alone justifies the effort!

Figure 7: LSRL Report Part 5 (see larger image)

A report is produced during and after every LS cycle and it is not surprising that the proposed changes for the next version of the LSRL plan appear small.

In alignment with the learning demands in a new class, LS-teams create variations of a LSRL plan with each new cycle. These plans are increasingly perfected and still need to be re-organised with each implementation. The collaborative negotiation of new variations sharpens the teachers' focus on individual students' learning in very specific areas. At the same time, these variations contribute to the generalisation of knowledge, because the collaborative deconstruction of old learning opportunities and the construction of new ones generate increasingly deep teacher understanding of individual learning.

2.6   TASKS

2.6.1   TASK 1

Refer to your work in Module 1, download this template and fill in the LS-design overview and timeline. With your LS team, agree on a theme for your LSRL and share the LS-design overview and timeline, the materials and ideas you have already collected. Please rename your document Task 1_LS_team_x and upload a MS Word document.

Deadline: 4 days after beginning of the module

2.6.2   TASK 2

In an online or offline meeting, read the objectives presented in this example. It describes the starting competences as well as the anticipated competences and performances from a general point of view, i.e., the descriptors reflect the core objectives which should be achieved by most learners in the class. Moreover, it demonstrates the available/already acquired competences (i.e., what the students already know and what they can do), as well as the anticipated objectives and performances of three learners (case students), who are typical representatives for students who would be expected to reach the core objectives (Learner A), the more complex objectives (Learner B), or the simpler objectives (Learner C). The information about the case students' readiness for and interest in learning about a certain topic may be known by the class teacher or inquired (interviews, questionnaires, informal conversations…). Discuss how these goals are similar or different from what you usually do when you plan student learning. Post your discussion notes in the Forum.

Deadline: 6 days after beginning of the module

2.6.3   OPTIONAL TASK I

Explore some LSRL-plans and identify ideas you might integrate to your current or future planning. Summarise your findings and discuss them in the **Forum.** Copy your Forum entry to your portfolio, should this be an option of your choice.

LSRL-plans

https://emily.neocodesoftware.com/fmi/webd#ResearchLessonPlans

https://lessonresearch.net/resources/content-resources/

https://www.ph-noe.ac.at/de/fortbildung/spezifische-bereiche/lernen-mit-wissenspartnern-und-lesson-study/englisch

https://www.ph-noe.ac.at/de/fortbildung/spezifische-bereiche/lernen-mit-wissenspartnern-und-lesson-study/informatische-bildung-und-medienbildung

2.6.4   TASK 3

Collaborate on creating a similar set of objectives related to the big goal of your LSRL and the learning outcomes identified for the three case study students in the class you will be teaching. Use this template, rename your document Task 3_LSteam_x and upload a MS Word document.

Deadline: 10 days after beginning of the module

2.6.5   OPTIONAL TASK II

Setting big goals and deconstructing them into learning objectives before choosing activities or content to teach is an essential component of competence-oriented education and reflected in "Backward Design" (Wiggins & McTighe, 2005). It ensures that the content taught is focused and organised towards the objectives to be reached.

Once the learning objectives have been identified, finding appropriate criteria for assessment is crucial before even thinking about "the plan". To conceptualise an assessment before deciding on the activities in lessons is important because "Backward Design" intends to guarantee that the assessment (formative or summative) aligns with the objectives. This ensures that only the planned performances are assessed and assessing something that was not an intended goal is avoided or, if proven important, added in the next LS-cycle. If the assessment is in line with the objectives, the end becomes the beginning, and the path teaching and learning should take becomes distinct and evident. Negotiating performance descriptors and criteria to decide on the level of fulfilment is not just an important part of planning a LSRL. They will also prove to be useful in the development of observation schedules (see Chapter 3).

Watch the two videos about *Backward Design* by Grant Wiggins and/or read about planning using LS (Reader or your own literature research). Write a **Forum** entry about the approach and what benefits it may hold for your practice. Copy your Forum entry to your portfolio, should this be an option of your choice.

https://www.youtube.com/watch?v=4isSHf3SBuQ

https://www.youtube.com/watch?v=vgNODvvsgxM

2.6.6   TASK 4

Collaborate on a LSRL plan. Discuss which parts of the lesson or activities should be observed intensively because your team considers them crucial in the learning process. Highlight these parts yellow.

Use the below templates or your own, rename your document *Task 4_LSteamx_v1* and upload a MS Word document here.

LSRL-plan English

Deadline: 14 days after beginning of the module

After receiving feedback from your course tutor, revise and rename your document *Task 4_LSteamx_v2* and upload a MS Word document as well..

Deadline: 28 days after beginning of the module

2.6.7   OPTIONAL TASK III

Have you ever observed student learning? What did you observe and for what purpose? What was your experience like? Post your thoughts on the **Forum** and provide a question for your peers to answer.

Summarise the discussion and add it to your portfolio, should this be an option of your choice.

2.6.8   OPTIONAL TASK IV

Have you ever used any type of feedback methods in your classes? What kind of feedback methods did you use and for what purpose? What was your experience like? Publish your thoughts on the **Forum** and provide a question for your peers to answer.

Summarise the discussion and add it to your portfolio, should this be an option of your choice.

2.6.9   OPTIONAL TASK V

You may also watch some input about feedback and observation. Discuss your thoughts about it with your peers in the **Forum**.

Summarise the discussion and add it to your portfolio, should this be an option of your choice.

English

https://www.aitsl.edu.au/teach/improve-practice/feedback

https://www.youtube.com/watch?v=n7Ox5aoZ4ww

https://www.kqed.org/mindshift/44948/lesson-study-when-teachers-team-up-to-improve-teaching

2.6.10 TASK 5

Look at the semi-structured observation schedule in our example, copy and adapt the template to match your specific LSRL-plan or use your own template.

The example has structured observation already integrated in the observation schedule because the research interest of this LSRL was to find assessment activities and ways of recording output in a foreign language class. This structure was meaningful because the learning situations created opportunities for such observations. However, you might consider several observation tasks for a short sequence overwhelming. We agree, they might limit the space for your open observation, and you might go for a simpler schedule in the beginning.

In your group, discuss the three selected case students again and copy and paste the expected learning behaviour together with the phase and probably some basic information about its content.

Then, think about the kind of observation you consider meaningful and how you might record your observations.

Use one of the below templates or your own adaptation, rename your document *Task 5_LS team x_version 1* and upload a MS Word document to [please create folders: LSRL-observation, LSFS-Beobachtung — course tutors should be able to comment directly].

LSRL_observation schedule 1

Deadline: 28 days after beginning of the module

After receiving feedback from your course tutor, revise and rename your document *Task 5_LS team x_version 2* and upload a MS Word document.

Deadline: 35 days after beginning of the module

2.6.11 TASK 6

Look at the semi-structured interview schedule below, copy and/or adapt it to your specific LSRL-plan and observation schedule or use your own interview schedule.

LSRL_interview schedule

Rename your document *Task 6_LSteam x_version 1* and upload a MS Word document.

Deadline: 28 days after beginning of the module

After receiving feedback from your course tutor, revise and rename your document *Task 6_LSteam x_version 2* and upload a MS Word document as well.

Deadline: 35 days after beginning of the module

2.6.12 TASK 7

Implement your LSRL, observe and interview the students. Arrange your post-lesson discussion and, if there is a time gap between the LSRL and the discussion, make notes about your experience for your post-lesson reflection meeting.

2.6.13 TASK 8

Look at the reflection templates below and make notes before, during and after the post-lesson discussion. Use your post-LSRL notes and such from observations and interviews during this process.

LSRL-reflection

Rename your document *Task 8_LS team x_version 1* and upload a MS Word document here.

Deadline: 40 days after beginning of the module

2.6.14 OPTIONAL TASK VI

If you are interested in various ways of organising collaborative discussion and dialogue, you might explore the following resources.

You can find an article about reflection here: Reader

You can also find guiding questions & guides for pre- and post-lesson discussions here:

http://www.lsalliance.org/resources/kyouzai-kenkyuu/

https://www.lsalliance.org/resources/facilitating-post-lesson-discussion/

Share ideas about resources you like and discuss your thoughts about them with your peers in the **Forum**.

Summarise the discussion and add it to your portfolio, should this be an option of your choice.

2.6.15 OPTIONAL TASK VII

Explore various LSRL-reports and identify ideas you might integrate to your current or future reporting. Summarise your findings and discuss them in the **Forum.** Copy your Forum entry into your portfolio, should this be an option of your choice.

LSRL-reports in English

[LSRL-report](#)

2.6.16 TASK 9

Collaborate on a LSRL-report and upload it.

Use the below templates or your own, rename your document Task 9_LSteam x_version 1 and upload a MS Word document.

[LSRL_report](#)

Deadline: 44 days after beginning of the module

After receiving feedback from your course tutor, revise and rename your document Task 9_LSteam x_version 2 and upload a MS Word document as well.

Deadline: 48 days after beginning of the module

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3. LS4VET SUSTAINABILITY — FOCUS ON PROGRESS

3.1 DESCRIPTION OF THE MODULE

3.1.1 AIM

Successful Lesson Study is sustainable, and its innovative impact goes beyond the actual study and its immediate outcomes.

This module enables course participants to disseminate Lesson Study with a group of colleagues at their own school, so that its outcomes will become impulses for next projects in Vocational Education and Training (VET). At the end of the module, course participants will have implemented case study research in the context of Lesson Study in VET and communicated its results in collaboration with a knowledgeable other and/or a Lesson Study facilitator to a wider VET community. Thus, their Lesson Study will have developed collaborative professionalism within their Lesson Study teams. They will have established a community to cultivate Lesson Study in VET and to promote continuous knowledge creation and sharing.

3.1.2 ENTRY REQUIREMENTS

Completion of Modules 1 & 2.

3.1.3 CONTENT

- Strategies of dissemination
- Case study research
- Collaborative professionalism
- Lesson Study communities
- Sustainable Lesson Study

3.1.4 GOALS

The participants…

- disseminate Lesson Studies within their VET school and share the results of Lesson Studies to encourage other colleagues to take up Lesson Study in VET
- support a group of colleagues to learn about this process
- implement strategies to build a teacher professional development culture through Lesson Study

3.1.5 LEARNING OUTCOMES

The participants…

- disseminate Lesson Study processes (including, for example, collaborative professionalism and reflective practice) and Lesson Study practices with a group of colleagues at school
- develop a strategy to cultivate a sustainable Lesson Study approach for the group of teachers they are collaborating with
- make a plan to support an additional group of school colleagues to learn about Lesson Study

3.1.6 ASSESSMENT

Successful completion of the module requires:

- An active participation in e-learning and completion of course tasks - 25%
- One portfolio entry: Reflection on the challenges and benefits of the approach they adopted to disseminate Lesson Study among a group of school colleagues (individual work, total max. 300 words) - 25%
- One report/presentation. Present:

  (1) a strategy to make Lesson Study sustainable for the group teachers they are collaborating with; and

  (2) a plan to support a group of colleagues at school to learn about Lesson Study; (group work, total max. 700 words) - 50%

Assessment is based on a 4.0 criterion-oriented scale (see Appendix).

3.1.7 DURATION OF MODULE, ESTIMATED WORKLOAD AND MODE OF DELIVERY

3 weeks

1 ECTS

20% e-learning

50% self-study

15% digital face-to-face collaboration

15% analog face-to-face collaboration

3.1.8 SCHEDULE

	Individual work (Keep written records of reflections and upload work on assessment task in Moodle)	**Collaborative work (without the LS facilitator/e-tutor)** (Upload work on assessment tasks in Moodle)	**Collaborative work (with the LS facilitator/e-tutor) - at the end of each week** (Upload work in Moodle)
Week 1	Activity 3.1 Activity 3.2.2: Assessment task 1	Activity 3.1 Prepare materials for dissemination Identify potential sources for dissemination	Forum discussion 1 (online) for Activity 3.2
Week 2	Activity 3.1: Watch video on the power of lesson study	Activity 3.3 Activity 3.3.3: Assessment task 2	F2F meeting for Activity 3.3 (Discuss challenges in doing a lesson study)
Week 3	Activity 3.2: Watch video on 'What is sustainability?' Activity 3.7	Activity 3.5: Brainstorming Activity 3.6 Activity 3.4.4: Assessment task 3	F2F meeting for Activity 3.8 and Activity 3.9

3.2 PROMOTION AND DISSEMINATION

3.2.1 INTRODUCTION

An important aspect in making Lesson Study a doable professional development (PD) experience is to disseminate it within a group of colleagues and making them aware of its processes and benefits for teacher learning. The following strategies are to be kept in mind:

- Supported by the school leadership team, identify colleagues who are committed to collaborate. The identified group of teachers can be teaching within the same year group or subject department, or who share collegial experiences.
- Schedule a time slot to work with others and make it a part of the teaching responsibilities of your group. You will again need the support of your school leadership team (SLT) for this.
- Keep in mind that collaborative groups are composed of multiple personalities and unique belief systems which can lead to unproductive experiences.
- Technology plays a major role in modern teacher collaboration. Facilitate knowledge sharing by actively participating in a professional learning network that gives you direct access to the knowledge, experience, and resources of countless educators who you may have never connected with in your immediate professional circles. There are many teachers and other practitioners discussing Lesson Study on Twitter, for example.
- Develop and agree upon a shared vision and mutual goals. The level of ownership teachers feel about the process determines how much time and energy they really put into collaborating. Your group should be helped to understand that Lesson Study will enhance their practice.
- Foster a sense of community. Collaboration is all about building relationships. Taking the time to get to know your colleagues and relate on a personal level develops a greater sense of respect and trust.
- Establish group norms and expectations. Unfortunately, collaboration can be stressful and uncomfortable at times. It's important to develop a culture of trust, respect, and humility for everyone to thrive. Your team should delegate roles and responsibilities, as well as protocols for communication and time management.

3.2.2 PREPARING MATERIALS AND DISSEMINATING LESSON STUDY

Step 1: Preparing materials

In order to promote Lesson Study with colleagues, you would need to have gathered materials that can be used for promotional purposes. Usually, such materials are resources or products resulting from your own engagement in Lesson Study. The following are some ideas which can be useful:

- **Photos**
  - Working on planning the research lesson
  - A meeting that the Lesson Study group had with a knowledgeable other
  - The teaching of the research lesson
  - The post-lesson discussion
  - Students working during the lesson
- **Video/audio clips**
  - Teachers discussing the research lesson
  - Teachers observing the research lesson
  - Students working on a task
  - A planning or post-lesson discussion meeting
- **Testimonials (video, audio or written)**
  - Reflections of teacher participants about their experience, benefits and or challenges
  - Comments of students about the lesson or their involvement in the Lesson Study process

- ◦ Comments from a SLT member about the potential of Lesson Study for teacher professional development
- ◦ Comments from knowledgeable others about their intervention
- **Lesson Study resources**
  - ◦ Artefacts (e.g. a chart) showing, for instance, a brainstorming activity during which teachers were identifying the research problem
  - ◦ A lesson handout
  - ◦ A model or poster planned and used in the lesson
  - ◦ The lesson plan
  - ◦ The Lesson Study report

Step 2: Sources for dissemination

In order to promote Lesson Study with colleagues, you may use a variety of promotional platforms, namely:

- *Social media platforms*: Facebook, Twitter, Instagram and others that are mostly followed by colleagues
- *School journals and newsletters*: Printed and/or in electronic form
- *Posters*: E.g. showing the Lesson Study process that your team engaged in or images illustrating the Lesson Study stages
- *Email shots*: Including information about the Lesson Study carried out
- *Testimonials*: E.g. Filmed endorsements that can be shared on school media
- *Staff and/or team meetings*: Whole school or small group staff meetings, professional development sessions and subject departmental meetings

3.3   IDENTIFY POTENTIAL PARTICIPATING EDUCATORS

3.3.1   INTRODUCTION

In disseminating your Lesson Study, you may consider a small group of educators (not more than 6) from Groups 1, 2 and 3 (see table below). You can either decide to focus on just one specific group or identify potential individuals within more than one group. Including educators from Group 4 (SLT) is optional. However, you may consider this as well for Lesson Study sustainability purposes (see section 3.4).

GROUP		TEACHERS
1	**Teachers of occupational skills**	These teachers work within labs, workshops, industry – potentially present an increased challenge to engage in lesson study as they work outside the classroom environment or within industry.
2	**Teachers of key skills**	These teachers are central supporters of occupational development delivering key skills for vocational education – ICT; Languages; Social & Personal Education; Mathematics, etc.
3	**Teachers of occupational theory**	These teachers work within the classroom and are potentially more present within the school – could be easier to engage within Lesson Study.

4	**Senior Leadership Team members**	One could consider inviting SLT members – quality assurance; curriculum development; resource development; industry placement coordinators; are some of the potential participants.

3.3.2 LESSON STUDY: STRENGTHS AND CHALLENGES

Lesson Study has many benefits and according to Dudley (2015, p. 4) it is "the world's fastest growing approach to teacher learning". Its globe outreach is attributed to its robust process that enhances and cultivates teachers' collaborative and autonomous professional learning. Lesson Study includes many features of effective professional development since it is:

- Intensive and an ongoing process
- Collaborative
- Teacher-driven and places teachers as experts
- Connected to classroom practice
- Intended to improve student learning
- Based on and promotes research about teaching
- Includes the support of more knowledgeable others

Benefits

Watch a short YouTube video clip entitled *The Power of Lesson Study*. The clip presents the views of a SLT member on the power of lesson study.

Challenges

Notwithstanding its many benefits, Lesson Study offers a number of challenges for teachers to implement it. This is particularly the case when Lesson Study, which is based on a Japanese model of teacher professional development, is transported and implemented in a different educational context.

The most challenging aspects mentioned by teachers are:

- **Time**: Since Lesson Study requires substantial time, teachers may have limited time availability and opportunities to meet within school hours.
- **Collaborative culture**: Creating a safe and non-threatening environment within which teachers may be willing to expose their work, practices, ideas, challenges and dilemmas.
- **Location**: When groups of teachers work in different locations (e.g. off campus and on campus team members; teachers of VET theory working with those teaching the more practical VET components)
- **Support from SLT**: Teachers may struggle when they do not find the necessary support from SLT. This could be related to solving logistical issues related to finding meeting times, replacement teachers and/or having a genuine interest in the work of the Lesson Study team.

3.4 COLLABORATIVE LEARNING WITHIN SCHOOLS

3.4.1 INTRODUCTION

What are the benefits of working in a group?

Groups tend to learn through discussion, clarification of ideas, and evaluation of others' ideas.

Educational and teaching expertise is a powerful gift, especially when shared. Some teachers may have solved problems with access to the same resources in the same context as others who haven't been able to solve them yet. Sharing each other's experiences can help to discover these successful behaviours and strategies and promote their adoption. Such a practice also greatly benefits the teacher who's sharing it.
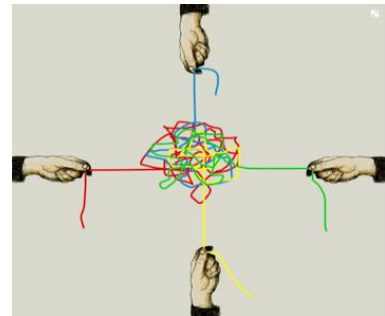
3.4.2 EFFECTIVE TEACHER LEADERSHIP

For effective teacher leadership, your school needs to create a culture of:

- **Empowerment**: expert teachers need to feel confident in their ability to help others.
- **Time**: there needs to be enough time for lead practitioners to meet with their peers, using video could be a way to overcome timetabling issues and relieve time pressures.
- **Opportunities**: teacher leaders need to be given the opportunity to take on a variety of responsibilities, such as coaching and mentoring peers as well as leading collaborative group work around specific areas.

"All teachers have the skills, abilities and aptitude to lead and should be trusted to do so." (Harris and Muijs, 2003, p. 5)

A great way to foster Lesson Study in your school is to establish a Professional Learning Community.

To what extent do you think you can promote collaboration in your school?

1. Establish clear goals

2. Build trust and promote open communication

3. Focus on enhancing problem-solving and critical thinking skills

4. Technology makes collaborative learning easier

5. Value diversity

Reflection

While sharing good practice is a great start, sharing alone isn't enough.

If the sharing also includes mentoring and coaching, then the necessary help and support are at hand, so when problems in the attempted transfer arise, they can be talked through and demonstrated with reassuring encouragement.

Lesson Study can be an effective way of improving practice. It is:

- associated with whole-school improvement,
- continuous not occasional, and
- everyone is an active participant, combining learning and development with practice.

- different to traditional methods of Continuing Professional Development because it requires teachers to work together over time in a trusting and democratic environment to share what they do (not what they know).
- helps teachers build expertise and develop interventions that improve their practice and impact on pupil outcomes.

3.5   SUSTAINABLE LESSON STUDY FOR A GROUP OF TEACHERS IN A SCHOOL

Section 3.5 aims to prepare participants to develop a group strategy aimed at making Lesson Study sustainable for them, as a group of teachers collaborating on this form of teacher professional development in a school.

3.5.1   PREPARATORY WORK

In preparation for the work of Section 3.5, participants are invited to view the 10-minute YouTube video clip entitled *What is Sustainability?* presented by Dr Christian Weisser from Penn State University, Pennsylvania, USA.
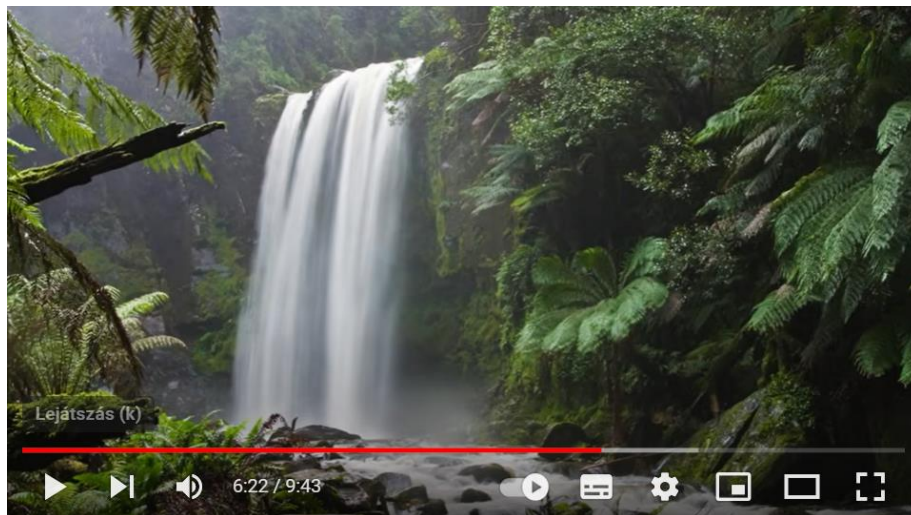
While watching this video, participants are encouraged to focus on gaining a basic understanding of:

- the contexts in which the term 'sustainability' is used;
- what is meant by sustainability; and
- how and why our interest in sustainability developed.

3.5.2   THE NOTION OF SUSTAINABILITY

The term 'sustainability' was coined in the eighteenth century by a German forester, Hans Carl von Carlowitz, when proposing a method for managing forests on an enduring basis. But it was only in the 1980s and 1990s, particularly in the aftermath of the UN Conference on Environment and Development (UNCED) held in Rio in 1992, that this term became widely known and used. Since then, however, the initial focus of linking sustainability to environmental issues has shifted to start encompassing all kinds of disciplines. In fact, nowadays, there is hardly anything that cannot be described in terms of its relation to sustainability. For example, one hears people talk about sustainable cities, economies, energy sources, business, lifestyles, development and tourism. Not surprisingly, the term 'sustainability' has also been linked to issues related to education. These links are explored in activity 3.5.

In reality, the essence of sustainability cannot be readily determined, as different perspectives come into play when sustainability is applied to different contexts. These varied perspectives have led to many definitions that

are, at best, not easily comparable. Nevertheless, for the purpose of this module, it suffices to define sustainability with reference to what Costanza and Patten (1995) argue is its 'basic idea', that is, the understanding that something is sustainable if it manages to survive or persist.

When speaking of sustainability, the three key issues to keep in mind are:

- an indication of 'what' is to be declared sustainable;
- the understanding that sustainability revolves around issues of change, innovation or adjustment; and
- sustainability implies some form of relationship between what is declared sustainable and its supporting environment.

Consider, for instance, the introduction of a new assessment policy that aims to introduce an element of continuous assessment as part of how students are assessed in class by their teachers throughout the scholastic year. This policy would be deemed sustainable if it retains its stability, coherence and integrity over time, and in so doing achieves its intended goals. But how would this new policy measure up against the three key issues of sustainability? In this case:

- The 'what to be declared sustainable' would refer, for instance, to the specifics of the new continuous assessment policy, including among other things its rationale, aims, implementation strategies and resources, actors and their actions, and timeframes.

- Being a new policy, it would satisfy the criteria of being an 'issue of change, innovation or adjustment'. However, the specifics of how the new policy relates to current practices would depend, for instance, on whether it introduces new assessment ideas or else complements or modifies pre-existing assessment policies.

- The 'supporting environment' would include, for instance, the national and/or regional assessment and certification policies, the school culture and leadership team, the monitoring system, and the preparation of teachers, students and parents for the new reform.

In Activity 3.6, the participants will gain an understanding of how educational initiatives / activities (including Lesson Study) could be analyzed from a sustainability perspective.

At this point, we would like to propose the following definition of sustainable Lesson Study in the context of a group of teachers who are collaborating to implement Lesson Study in their school:

Lesson Study becomes sustainable for a group of teachers when their involvement in this professional learning activity 'survives' or 'persists' beyond the initial try-out, which is often led and supported by external professionals with expertise in Lesson Study.

However, in recognition that definitions need to be understood and also to be fit for purpose, the participants are invited now to take part in Activity 3.7. This activity aims to facilitate their understanding of the proposed definition and also, if need be, to help them amend it or even come up with their own definition of sustainable Lesson Study.

3.5.3   TOWARDS SUSTAINABLE LESSON STUDY

To achieve sustainability, the implementation of an initiative / activity needs to be sensitive to the embedding context. In fact, the implementation of Lesson Study outside Japan, where it originated during the nineteenth century, is characterized by adaptations to make it suitable for the local context. It is however important that these adaptations do not change the nature of Lesson Study, as otherwise one might risk rendering their form of Lesson Study indistinguishable from other forms of non-Lesson Study teacher professional development initiatives. The literature suggests that a professional development initiative for teachers, in order to be

considered as Lesson Study, needs to include four crucial components, namely, 'study', 'planning', 'doing' and 'reflecting'. Consequently, the search for sustainable Lesson Study in a school by a group of teachers has to keep in mind two things:

- It has to be a form of professional development that includes, in some form or another, all the important components of Lesson Study.

- It has to be a form of professional development that is sensitive to the school context and the wider local educational and cultural contexts.

Consequently, sustainable Lesson Study would imply that any adaptations to the format of the professional learning initiative and all other forms of action undertaken by the group of teachers do not jeopardize the substance of either Point (a) or Point (b) above. A good starting point when a group of teachers proceeds in this direction would be to negotiate among themselves how they would define 'sustainable Lesson Study'. This brings us back to the definition that was selected by the group during Activity 3.7. Using this definition, the participants now engage with Activity 3.8, which invites them to reflect on the impact that contextual elements have on the sustainability of Lesson Study.

Activity 3.8 seeks to create awareness of how the embedding context (which, like an onion, could consist of various layers) could help or hinder the implementation of Lesson Study on a sustainable basis. The next step, however, is to explore what you can do to render the context in which you operate more amenable to a sustainable approach to Lesson Study. Given that you are a group of teachers working on your own, it is highly likely that at this point you would want to address the 'elements' that you included in the intersection between 'school context' and 'impede sustainability'. This brings us to Activity 3.9, the last one, during which you explore what you can do as a team of teachers to render, as far as possible, Lesson Study sustainable for them.

Notes

- Videos from Youtube can be pasted by copying the link. The e-learning environment (VLE) has its own video player application, so learners can watch the video within the VLE without having to go to Youtube.

- If you insert a diagram you have drawn, please attach the PPT in which you edited it.

- For all other figures, pictures, if it isn't your own, please give the source.

3.6 TASKS

3.6.1 ACTIVITY 3.1

Discussion:

Individual work:

Take some time to reflect on the above strategies and decide which of these you would apply to disseminate lesson study with a group of colleagues. Identify a strategy that involves the SLT for support and explain why it could be effective for dissemination purposes.

(5 minutes)

Whole group work:

Come up with, at least, two strategies you could apply in your school.

(15 minutes)

Note: Please record the individual work so you can share it with the whole group.

3.6.2 ACTIVITY 3.2

Discussion:

Whole group work

Discuss the following questions. You can also identify potential teachers.

- *Which group/s would you consider?*

- *Why?*

(15 minutes)

3.6.3 ASSESSMENT TASK 1

Task 1 - click on this text to access the templates and to submit the task!

3.6.4 TASK 1

Write a reflection on the challenges and benefits of the approach you adopted to disseminate Lesson Study among a group of school colleagues (individual work, total max. 300 words)

Deadline: 14 days after beginning of the module

3.6.5 ACTIVITY 3.3

Discussion:

Think-Pair-Share

Discuss the following questions

- *Besides the challenges outlined above, what other challenges did you encounter in doing your lesson study?*

- *Select one challenge and explain how you attempted to address it.*

Think: Reflect on the above questions on your own

(3 minutes)

Pair: Discuss your reflections with a colleague

(5 minutes)

Share: As a whole group share your insights

(7 minutes)

3.6.6   OPTIONAL TASK II

Discussion:

- What are the challenges of promoting collaboration in your school?

- Identify at least two main challenges and discuss how you might overcome these.

(5 minutes)

3.6.7   ASSESSMENT TASK 2

Task 2 - click on this text to access the templates and to submit the task!

3.6.8   TASK 2

Present a plan to support a group of colleagues at school to learn about Lesson Study (group work, total max. 350 words). Provide details of the key steps that you would take.

Deadline: 21 days after beginning of the module

3.6.9   ACTIVITY 3.5

The group brainstorms to answer the following question:

What education-related initiatives / activities come to mind that could be likewise linked to sustainability?

(2 minutes)

Note: (i) participants cannot choose Lesson Study in this activity; and (ii) one of the participants takes note of the suggestions made in preparation for the next activity.

3.6.10 ACTIVITY 3.6

Collaborate as a group:

- select one of the initiatives / activities that were identified in Activity 3.5;

- discuss how this initiative / activity could be presented in relation to the three key issues of sustainability;

- repeat Step 'b' for Lesson Study; and

- record your responses for step 'c' in writing.

(8 minutes)

Note: The records kept in Step 'd' could be referred to by participants when they work on the next activity.

3.6.11 ACTIVITY 3.7

You have been presented with the following definition of sustainable Lesson Study for a group of teachers:

Lesson Study becomes sustainable for a group of teachers when their involvement in this professional learning activity 'survives' or 'persists' beyond the initial try-out, which is often led and supported by external professionals with expertise in Lesson Study.

On the basis of your viewing of the video entitled *What is Sustainability?* and the issues raised during this session, you are encouraged to discuss the following questions:

- What do you think of this definition? Would it work for you? Why?

- Would you consider changing / amending it? Why?

- Would you like to propose an alternative / amended definition? Which? Why?

(10 minutes)

Note: By the end of this activity, the participants will have to decide and note which definition of sustainable Lesson Study they will be adopting: will they retain the one being suggested, amend it, or go for a new one?

3.6.12 ACTIVITY 3.8

Refer to the definition of sustainable Lesson Study that you selected, as a group, during Activity 3.8. Then:

- Identify the elements in your school context, the industry and the wider educational and culture contexts that would support you to attain this understanding of sustainability and those that would impede you from achieving this.

- Position the selected elements across the four 'boxes' shown below:

Sustainable Lesson Study	support sustainability	impede sustainability
Elements in the school context that:		
Elements in the wider educational and cultural contexts that:		

(10 minutes)

3.6.13 ACTIVITY 3.9

- Refer to the elements identified in Activity 3.8 that belong to the intersection between 'school context' and 'impede sustainability', and divide them into two categories: those that you can do something about and those that you cannot do anything about.

- Focus on those elements that you can do something about. Come up with a minimum of 3 ideas of what you could do, within the affordances of your status at school and the collaboration from the industry sector, to change / modify these elements in a way that makes them less problematic for, and possibly conducive to, the sustainability of Lesson Study.

- Discuss how you could go about, as a group of teachers in a school, to realize the identified changes / modifications to the elements discussed in Point (b) above. The idea is to draft a plan of action (i.e. a strategy) aimed at making the school context more amenable to the sustainability of Lesson Study.

(20 minutes)

3.6.14 ASSESSMENT TASK 3

Task 3 - click on this text to access the templates and to submit the task!

3.6.15 TASK 3

Present a strategy to make Lesson Study sustainable for the group of teachers they are collaborating with (group work, total max. 350 words)

Deadline: 28 days after beginning of the module

3.7   BIBLIOGRAPHY

Costanza, R. and Patten, B. C. (1995) Defining and predicting sustainability, *Ecological Economics*, *15*(3), 193-196.

Dudley, P. (2015) *Lesson Study: Professional Learning for Our Time*. New York: Routledge.

Harris, A. and Muijs, D. (2003*) Teacher Leadership: Principles and Practice*. Nottingham, UK: National College for School Leadership.

4. LS4VET IMPACT — FOCUS ON LEADERSHIP — OPTIONAL MODULE

4.1 DESCRIPTION OF THE MODULE

4.1.1 AIM

Although Lesson Study is based on the voluntary collaborative work of teachers, the role of the school is also very important in this process. The school by its leaders provides the organisational context for the Lesson Study cycle(s), supports teachers in their work, and at the same time strives to develop as an institution which learns from Lesson Study activities, including the school leaders, teachers' groups in the school, and individual teachers.

The aim of this optional module is to familiarise the participants with the possible organisational aspects of Lesson Study. The module enables the participants to develop and utilize their leadership abilities in their Lesson Study teams. It prepares them to collaborate with the school leaders who can secure the organisational support for the introduction and sustained use of Lesson Study and who can support Lesson Study teams to identify the organisational learning opportunities of the school and to collaboratively implement organisational development strategies. The module also enables the participants to develop the institutional sustainability of Lesson Study in Vocational Education and Training (VET) contexts.

4.1.2 ENTRY REQUIREMENTS

None for chapters 4.2 and 4.5

Completion of Modules 1-3 for chapters 4.3 and 4.4

4.1.3 CONTENT

4.1 General introduction

4.2 LS4VET and school level leadership/management. Processes and challenges of organisational adaptations and implementation

4.3 Lesson Study and the school as learning organization

4.4 Sustaining LS4VET in your school

4.5. Collaboration, communication and conflict resolution at team and organisational level

4.1.4 GOALS

The participants…

- are able to create development plans on implementing the principles, general concepts, and processes of LS4VET in the context of a learning organisation.

- are able to identify stages in team development and challenges for team and school leadership/management in enabling VET teachers to initiate, implement, internalise and sustain Lesson Study with necessary local adaptations.

- know strategies to support VET teams in the implementation of Lesson Study in the school and in the broader VET community, to detect relevant factors in change agent success, and to establish and support a learning culture of collaboration in VET.

- know leadership principles of Lesson Study which support change and reflect on how to embed new structures, beliefs, and values into existing VET cultures.

4.1.5 LEARNING OUTCOMES

The participants…

- develop a LS4VET sustainability strategy (concept plan of the sustainability of LS4VET in the school as/for a learning organisation, adaptation, implementation and internalisation: organisational processes and tasks and ground rules) in collaboration with the school leaders.

- develop a plan on the continuous LS4VET dissemination activity of the school.

- develop a collaboration, communication, and conflict resolution plan for LS4VET teams and school leaders.

4.1.6 ASSESSMENT

Successful completion of the module requires:

- active participation in e-learning and completion of course tasks (individual and group work, 50%)

- 3 portfolio entries (50%): plans prepared in group work for

  1. the adaptation, implementation and internalization of LS4VET in the school (LS4VET sustainability strategy) (2 pages)

  2. the continuous Lesson Study dissemination activity of the school (1 page)

  3. team level collaboration, communication and conflict resolution (1 page)

Assessment is based on a 4.0 criterion-oriented scale (see Appendix).

4.1.7 DURATION OF MODULE, ESTIMATED WORKLOAD AND MODE OF DELIVERY

3 weeks

1 ECTS (25-30 class hours = 18.75-22.5 hours, depending on the national regulations)

70 % e-learning and self-study (18-21 class hours = 13.5-15.75 hours)

30 % digital face-to-face collaboration

4.1.8 LEARNING GUIDE

Step-by-step instructions will be provided by your e-tutor on how to proceed through the module. You are asked to use your personal blog in Moodle for the reflective activities in the module. This should be included with the module assignment at the end.

4.1.9 SCHEDULE

	Individual work	Collaborative work (without the LS facilitator/e-tutor)	Collaborative work (with the LS facilitator/e-tutor) - at the end of each week

Week 1	reading chapters 4.1.-4.3. and reflection (recording reflective activities 1-4 in personal blog)	-	Online: Forum discussion 1 F2F meeting 1 (questions/activities, working on Task 1 and planning Week 2)
Week 2	reading chapters 4.4. and reflection (recording reflective activities 5-8 in personal blog)	working on Assignment 1	F2F meeting 2 (questions/activities working on Assignment 1 and planning Week 3)
Week 3	reading chapter 4.5	working on Assignments 2 és 3	Online: Forum discussion 2 F2F meeting 3 (questions/activities, discussion of Assignments 2 and working on Assignment 3)

4.2   GENERAL INTRODUCTION

One of the most important features of Lesson Study is that teachers set up and run their Lesson Study (LS) teams autonomously. This allows them to focus on topics that they themselves consider important for their teaching work, rather than topics assigned by the school management or other governing bodies. One of the reasons why LS experts support this method of developing teachers' work is that it can enhance developing teacher autonomy. By doing LS, innovations can be generated in the context of education that are not alien to the educational culture of the schools concerned, and which do not waste or distort innovation or the functioning of the school organisation but fit in with it and are capable of producing real, bottom-up local improvements. It is also important to note that, in the process, teachers themselves are "forced" to develop professionally, since in doing LS they are not only recipients, passive adopters as in the case of central innovations, but researchers, developers, adapters, quality controllers and further developers of their own professional growth.

However, many descriptions of Lesson Study focusing on the technical steps of LS itself forget that LS does not take place in a vacuum, in a self-acting group of teachers, but that this self-acting group itself exists as part of one (or sometimes more than one) institution(s). Teachers who engage in LS4VET should therefore be aware that they are working as part of an institution and must take into account its legal and social environment, the written and unwritten rules and customs of their school. Furthermore, doing LS work may have organisational and even financial implications, and therefore the LS4VET team should liaise and communicate with the school leaders at certain key points. Finally, creating the conditions of sustaining Lesson Study in the school requires the continued commitment and support of school leaders and the continuous smooth collaboration between them and teachers doing LS. In the LS4VET Model, creation of a Meta School LS Community is recommended to enhance the sustainability of LS4VET in the school.

Teachers engaging in Lesson Study should also be aware of the fact that their activities can make a significant contribution to the institutional development of the school, which is in the interest of the school leaders as well as the teachers themselves. The professional value that the LS4VET team creates can also contribute to the continuity and survival of LS4VET in the school, as it is important for an educational institution to retain, disseminate and further develop its most valuable and usable innovations. An important feature of Lesson Study is the horizontal working relationship between the teachers who make up

the LS4VET team. This allows teachers to explore difficulties in their work in a confidential and trustful professional environment, to share knowledge that can help to solve these difficulties, and to test new solutions in a safe professional environment. However, this is not contradicted by the fact that, in practice, the LS4VET team still needs some kind of coordination and a spokesperson because in group activities many situations may arise that require ways of negotiating and making final decisions.

In Module 4, based on content from the literature provided in this Module as well as on reflection on your own experiences, we will discuss issues related to the organisational embeddedness of doing Lesson Study, the school level collaboration processes, and the conditions of sustaining LS4VET as an established method of teacher professional development in the school. Finally, we will get to some aspects of team-level dynamics as regards collaboration, communication and conflict resolution, since these are in connection with team management.

In Module 4 there are some topics you may have also learnt about and discussed in other modules of this course (eg. how to start lesson study [Module1] or sustainability [Module 3] etc). However, in this module the main focus will be on the organisational aspects and to a lesser extent on team management.

4.3   LS4VET AND SCHOOL-LEVEL LEADERSHIP/MANAGEMENT: PROCESSES AND CHALLENGES OF ORGANISATIONAL ADAPTATION AND IMPLEMENTATION

4.3.1   INTRODUCTION

Although teachers perform an autonomous activity within the LS4VET team, they must take into account the organisational characteristics of the school as an educational institution, and as part of this, the fact that the professional and legal responsibility for all activities in the school rests on the shoulders of the school leaders or school managers. The school leaders/managers may have visions for the pedagogical development of the institution which the LS4VET team could usefully inform and discuss the alignment of their LS activity with this vision.

The content, form and process of this discussion and negotiation with the school leaders/managers will depend to a large extent on the institutional characteristics of the school, the style and specific methods and the educational beliefs of the school leaders, and whether Lesson Study is being introduced for the first time in the history of the institution or whether it has an established tradition in the school.

4.3.2   LS ADAPTATION AND IMPLEMENTATION IN A VET SCHOOL — BEFORE STEP 1

Lesson Study is traditionally based on teachers' autonomous activity in the school – still, they have to take into account the fact that schools are organisations with a school leadership/management (in American terms: school administration) that holds full legal responsibility for everything that happens there. Naturally, school leadership is not only important because of their legal responsibility, but also because of their important role in shaping the pedagogical reality and future visions in the school. This is why it can be said that "*Without at least one administrator who understands and values lesson study, it will be difficult (***if not impossible***) to sustain it*." (Stepanek et al., 2007; p. 18. *highlighted by authors of Module 4*). On the other hand, as the American authors continue, "*Administrators who are involved in the process, will help ensure that teachers have the resources and support they need, and will provide encouragement to teams as they face the many challenges of lesson study. Ideally, administrators will support lesson study as a means of increasing their own knowledge about teaching and students and finding new ways to support effective practices throughout the school or the district*." (Stepanek et al, 2007).

Therefore, before starting LS4VET, teachers who are planning to form an LS4VET team should consider the characteristics of their school management in terms of the following three aspects.

(1) The structure of school management

FOUR COMMON STYLES OF SCHOOL LEADERSHIP	DESCRIPTION AND RELEVANCE FOR LS4VET
AUTOCRATIC	Autocratic school leadership seeks to exercise a broad degree of directive control. Although LS is a self-regulated activity of teachers, in the case of autocratic school management it is advisable to agree in advance with the school management on all aspects of LS activities and to clearly clarify and even put in writing the information on the activities of the LS4VET team members. They should also agree in advance when (at which points of the activity) they will share this information with the school management.
PATERNALISTIC	In the case of a paternalistic school leadership with a strong personal vision there is a risk that the school leadership favours and promotes the pedagogical development of the school only in line with its own pedagogical vision. Thus, even if the school leadership is in favour of innovative pedagogical work in the school, it may prefer its own top-down innovations rather than bottom-up innovations. With this style of school leadership, it may be particularly important to agree with the school leadership on the topic the LS4VET team will focus on, in order to avoid future conflicts. If the topic is acceptable to the school leadership, it opens up the possibility for the LS4VET team to continue its research and development activities with the professional freedom that LS requires.
LAISSEZ-FAIRE	The laissez-faire style of school leadership is not favourable to the LS4VET team's activities because, although it allows teachers a wide degree of freedom, it offers them little support. For this style of school leadership, it is particularly important to find the organisational structural elements that can still provide the necessary logistical and professional support for the LS4VET team(s).
DEMOCRATIC	A democratic and transformational style of school leadership is most conducive to LS work. Such leadership is open to and supportive of development ideas from the teachers. It can provide the necessary freedom, but also the required professional and logistical support for the LS4VET team to prepare and carry out its LS work.

LS4VET team members should consider if the school leadership is divided into professional/educational and managerial leadership, what the division of labour and responsibilities is between them, and how the job and responsibilities of the deputies assisting the headmaster (principal) are structured.

The objective is to identify the person or persons in the school leadership who are responsible for coordinating the professional development of teachers in the school leadership.

In schools where there is a distinction between professional and managerial leadership, this person or these persons are likely to be found among the professional leaders.

(2) The style of school management

There are many ways in which school leadership styles are identified and distinguished in the educational literature (e.g., Browne, 2021; Chua, 2019; see Table 1). This is something that LS4VET team members should be aware of because it has a major influence on how closely they should work with school leadership, or at which points in their activities, or to what extent, they can work independently of school leadership. The style of school leadership depends not only on the personality traits of the school leader(s), but also on the teaching/leadership culture, institutional traditions, the way they deal with mistakes and create an environment in which to learn from them is enabled, and other factors that are specific to the educational system or type of school.

(3) Pedagogical views of the school leaders

Studies have found that the quality and fidelity of the implementation of Lesson Study in a school very much depends on the school leaders' educational beliefs as these influence their understanding of the general idea of LS (Boom-Muilenburg et al., 2021). Since the essence of Lesson Study is focusing on student learning, it matters how the school leaders think about teaching and learning, whether their pedagogical beliefs are more teacher- or student-oriented. It also matters how school leaders conceptualise teacher professional development (PD). Lesson Study is a form of PD through collaboration, and therefore school leaders will appreciate and understand LS only if they are aware of the importance of teacher collaboration and of teacher learning as construction and participation, and do not think of PD simply as acquisition of knowledge in a more or less formal setting (such as by participating in a teacher training programme or reading professional literature). Finally, since Lesson Study is a form of research, it is also of importance how the school leaders think about education research, if they appreciate and value practitioner research.

Before the start of a LS4VET cycle, there are several questions and issues that a LS4VET team should discuss, clarify, and agree on with the school leadership Taking into consideration the management structure, school leadership style and educational beliefs of your school leaders, you should consider and discuss the following, first with your colleagues and then with your school leaders:

- Who is the responsible person in the school management responsible for liaising with the LS4VET team?

- Who is the person responsible in the LS4VET team responsible for liaising with the school management?

- How does the work of the new LS4VET team fit into the school's organisation and long-term pedagogical development plan?

- What possible changes to teachers' working arrangements (timetables, workload) does the LS4VET team require for its activities, and how can this be secured by the school management?

- What resources (materials, funds, venue) and other technical, logistical or professional support is needed for the LS4VET team's activities?

- Can the teachers' participation in LS4VET be credited in any ways and, if so, under what conditions and how (by what rewards; e.g. by counting it towards the completion of their mandatory professional development)?

- Does the LS4VET team plan any activities for which the presence of school staff other than the members of the LS4VET team is envisaged, or or does it plan to invite teachers and professionals from other institutions (e.g. to the research lesson)?

- How does the LS4VET team plan to make the results available at school level or beyond?

4.3.3   LS ADAPTATION AND IMPLEMENTATION IN A VET SCHOOL — DURING STEPS 1 TO 7

Step 1 – Organise the team, set the goals

The composition of the LS4VET team does not need to be agreed upon with the school leaders, unless it requires changes in the teachers' work schedule that are not possible without their agreement.

The setting of objectives in some school cultures (Mynott, 2017) and leadership styles is done completely independently of school leadership, but in others this is done in consultation with the school leadership.

Step 2 – Study alone and together

This activity again does not require any special agreement with the school management, only if the selected knowledgeable other is a person from outside the school. In that case, the school leaders must be informed, and in some schools they must also approve and, if needed, secure the required funding for, the collaboration of the school's teachers with an external expert.

Step 3 – Plan the teaching unit

No collaboration with the school leadership is foreseen.

Step 4– Research lesson: teach and observe

It is strongly recommended to invite member(s) of the school leadership responsible for teacher professional development to this activity. This is the most important activity in which the school leaders can learn about the pedagogical results of the work of the LS4VET team.

If the LS4VET team wishes to invite other members of the teaching staff, the whole teaching staff or people from outside the school to this event, they must discuss it with the school leaders, as this may require changes in the school's organisation of work for the duration of the event and , considering the legal and logistical aspects of the presence of people from outside the school, and possibly also representation tasks on the part of the school leaders.

Step 5 – Analyse and discuss

If someone from the school leadership was involved in the observation of the research lesson, it is important that they also participate in the post-lesson discussion and have the opportunity to share their experiences, thoughts, and suggestions with the LS4VET team. However, it is important for the school leadership representative to bear in mind that s/he is present in the meeting as a member of a group characterized by horizontal organisation, communication and decision-making and as such s/he can only make comments and suggestions for work on an equal footing with any other participant.

Step 6 - Repeat

In this step, the school leadership should be consulted on the same issues as in steps 2 to 5; there is no further new specific consultation to be done.

Step 7 – Reflect and disseminate

Reflective discussions and note-taking throughout the LS4VET cycle should be carried out by the LS4VET team itself - although if the school leadership has been active throughout the work process and has been able to adopt to the team's horizontal working style, it is worth inviting a representative of the leadership to this part of the work as well.

However, in carrying out the dissemination part of the LS work, it may be necessary and of considerable professional benefit for the LS4VET team to work with the school leadership. In some schools, it is only the school leadership that can ensure that the documents summarising and synthesising the LS4VET team's activities are

preserved and made available to the wider professional community of the school. By playing an important supportive role in the dissemination of the LS4VET team's results and innovations within and beyond the school, the school leadership can make a significant contribution to the sustainability of the professional results achieved by the LS4VET team, as well as to the dissemination, maintenance and impact of the LS4VET team's pedagogical results in wider circles outside the school. This can also be a key point in disseminating and maintaining the culture of LS in other VET institutions.

4.4   LESSON STUDY AND THE SCHOOL AS A LEARNING ORGANISATION

4.4.1   INTRODUCTION

Lesson Study itself is a very valuable tool for teachers' learning and continuous professional development. However, teachers' individual or team learning is not necessarily a learning process for the school as an organisation: it takes place in the school as an organisation but the school as an organisation does not learn during/by this process.

Therefore, in this section of Module 4 we discuss aspects of LS4VET and the school as a learning organisation.

4.4.2   LESSON STUDY AND THE SCHOOL AS A LEARNING ORGANISATION

Peter Senge, "the father" of the learning organisation concept defined it as "*an organisation where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continuously learning to see the whole together*" (Senge, 1990, p. 3.). An organisation can become a learning organisation only if it is open to its social and cultural environment and also to new knowledge and innovation that are relevant from the interrelated aspects of the organisation and the environment. Organisational learning is a crucial aspect of the organisational sustainment of LS4VET activity and its results.

"Learning" is of course a phenomenon that applies only to living organisms, not to organisations. Yet this metaphor has a very important meaning. If an organisation is not a learning organisation, if only the people who work in the organisation are learning, then the organisation loses the knowledge they have acquired and built up when they leave the organisation (e.g., they look for another job, or retire etc.). An important goal of organisational learning, in addition to organisational development, is that the presence of the knowledge acquired by individuals, in this case, teachers in the school, should not depend on whether or not they stay as employees of the institution - their knowledge should become a part of the school culture.

Kools et al. (2020) state that schools can be considered as learning organisations if they can be associated with eight dimensions:

a)   a shared vision centred on the learning of all students,

b)   external partners contributing to school vision,

c)   continuous learning opportunities,

d)   team learning and collaboration,

e)   a culture of enquiry, innovation and exploration,

f)   systems for collecting and exchanging knowledge and learning,

g)   learning with and from the external environment, and

h)   modelling learning leadership.

From the aspects of LS4VET, all these points are meaningful and relevant:

a) a shared vision centred on the learning of all students. LS4VET is about shared visions of the teachers on student learning. It is not only about sharing the already existing visions of the teachers on student learning, but a collaborative process of developing a shared vision and practice on student learning.

b) all stakeholders (teachers, students and parents) contributing to school vision. As already discussed previously in this Module: teachers' LS4VET activity is meaningful from the aspects of the school if it is in harmony with the school vision on teaching and learning (while it is also improving this).

c) continuous learning opportunities. LS4VET provides one of the best opportunities for teachers' continuous learning, continuous professional development.

d) team learning and collaboration. LS4VET *per se* is team learning and collaboration in the school.

e) a culture of enquiry, innovation and exploration. LS4VET is an on-site-type enquiry on teaching practice, carried out by the practitioners themselves. However, it is not only exploration, but innovation as well: the teachers develop their teaching practices.

f) systems for collecting and exchanging knowledge and learning. The LS4VET Model recommends creating a Meta School LS4VET Community (see in chapter 4.3.3) to be in charge of collecting and exchanging knowledge and learning related to LS4VET.

g) learning with and from the external environment. Partly this is why KO(s) are so meaningful and important for a LS cycle. Some authors also draw attention to the possible importance of school-university partnership (Sarkar Arani et al., 2007). Our LS4VET model builds on or at least promotes both school-university and school-industry collaboration.

h) modelling learning leadership. This is one of the reasons why the collaboration between school leadership and the LS4VET team through the Meta School LS4VET Community (MSLC), which we recommend in the LS4VET Model and will discuss later in this module under 4.4.3 is so important. The MSLC can play a crucial role to shift an LS4VET team's learning and innovative activity to the level of organisational learning and innovation processes, and to adapt/upgrade the innovation(s) of LS4VET team(s) to a school level or even to a broader context (like school district, university teacher education etc.).

4.4.3 LEARNING: TO ACQUIRE NEW KNOWLEDGE AND TO FORGET — LEAVE BEHIND — SOME OLD KNOWLEDGE

Organisational learning is not only about acquiring and/or constructing new knowledge: many authors argue that it involves forgetting as well (see e.g., Kluge & Gronau, 2018). It does not literally mean forgetting in the sense of human learning, but rather leaving behind concepts and routines that are not effective anymore, and to bring new ones in their place, or make a new combination of old and new knowledge concepts and routines.

LS4VET is not only about an exchange of the professional concepts of the teachers, but it also involves the development of their new practice in the classroom – based on their shared concepts. As a part of learning, it is not easy to change the practice: to leave the old practice behind and to start a new one. Sometimes teachers avoid the 'leaving behind' part because they are uncertain about the change. The collaborative aspect of LS helps in this. As the proverb says in many languages: More eyes see more. Team discussions (also with KOs), long collaborative preparation processes, trial and discussion periods etc. can make the teachers involved in the process more confident that the old concept and practice can be abandoned because there is a new, better, more appropriate one.

We can conceptualise organisational learning and forgetting in a similar way - and that is not easy either. It is actually about introducing new practices, while the school "forgets" - leaves behind - certain other practices that have already become irrelevant. In the learning side: the school as a learning organisation can be more confident in upgrading the new knowledge and practice even on a whole school level, which was originally developed by a certain LS4VET team, so LS activity of the teachers can support this process very well.

4.5 SUSTAINING LS4VET IN YOUR SCHOOL

4.5.1 INTRODUCTION

In Modules 1 and 2 of this course, you have already carried out a Lesson Study with your colleagues and had the opportunity to reflect upon your experiences with regards to what and how you have learnt during this process. In Module 3 you have also learnt about the notion of sustainability and reflected on elements in your school context and the wider educational and cultural contexts that support or impede your **LS4VET team** to keep on doing LS4VET in your school. In this section of Module 4 we discuss how LS4VET can become sustainable as an established method of teacher professional development in a school, focusing on the **organisational level** conditions and support.

LS4VET is an educational innovation designed by researchers in collaboration with practitioners, based on the traditional Japanese Lesson Study and its many Western adaptations. The LS4VET Model is an **adaptation** of the Lesson Study "approach" for the context of vocational education and training, building on the special features of VET, such as the heterogeneity of VET teachers, students and programmes and its close links with the industry. When a team of VET teachers decides to engage in LS4VET, they are not only **implementing** but, in a sense, also **adapting** this Model to the special local conditions of their school and their team (school culture, leadership, educational beliefs etc.). However, in order to sustain LS4VET in their own practice and in their school in the long term, they also need to **internalise** LS4VET. It is very important that, as a result of their individual and collective sense-making (Coburn, 2001) and positive experiences during their own "piloting" of LS4VET, they begin to feel it no longer as an external reform imposed on them but as a practice that they "own" (Coburn, 2003). When the concept and practice of LS becomes "natural" in the school, when it becomes an "organisational routine" (Wolthuis et al., 2020a), we can say that it is "internalised" also from an organisational aspect.

4.5.2 KEY ORGANISATIONAL CONDITIONS OF SUSTAINING LESSON STUDY

Sustaining the use of Lesson Study for VET (LS4VET) as a method of teacher continuous professional development (CPD) in a school ultimately depends on two key conditions (Khaled et al., 2021):

1. that at least some of the teachers are sufficiently motivated to engage in and then keep on doing LS, and

2. that these teachers get sufficient support from their school to do this, so that the external conditions are favourable and promote and recognize the LS4VET teams' work.

Teacher motivation

Teachers' motivation to engage in and then keep doing a Lesson Study depends on, on the one hand, their perception of LS as a useful and meaningful activity (Wolthuis et al., 2020a). This perception in turn is subject to both:

- their own **educational beliefs** about teaching and learning (teacher- or student-oriented), about teacher professional development (acquisition or construction, individual or collaborative) and about educational research (researcher- or practitioner-oriented), and also

- their **experiences obtained in doing an LS**, which is dependent on the quality of that LS.

When teachers have already done a Lesson Study, the perception of usefulness or "meaningfulness" of Lesson Study is shaped by its impact they had experienced on their own and on their students' learning. This depends, on the one hand, on the effectiveness of Lesson Study as a CPD method in a general sense. On the other hand, the **quality of the implementation of the LS** they were involved in is crucial in this respect (Lim et al., 2018). In order to implement high quality LS, teachers need to properly understand the general script and key components of LS correctly (Akiba & Wilkinson, 2014; Wolthuis et al., 2020a, Yoshida, 2014), they need to hold the required skills (lesson planning, observation and reflection), and there should be experienced knowledgeable others/facilitators available to support them (Lim et al., 2018). Misconceptions about LS such as the belief that it is for creating original lessons, or that it is not useful to conduct only a few lesson studies, can greatly discourage teachers to engage in or keep doing LS (Chokski & Fernandez, 2004). Wolthuis et al. (2020a) argue that a key factor for Lesson Study to be productive is that teachers should "view teaching as research and to develop their identities as researchers''. Open discussion of failure, mistakes or uncertainty in research lesson designs detached from individual teachers but focused on student learning; the development of new educational beliefs, accepted through collegial dialogue and reflection; the appreciation of collaborative practitioner research and opportunities to celebrate success in staff meetings, conferences, or open RLs; and the sharing of leadership by developing teacher confidence in selecting and adapting strategies that drive school development and innovation are all important features of a successful Lesson Study (Mewald & Mürwald, 2019). Knowledgeable others such as outside experts are also important to maintain critical insights in LS teams (Chokski & Fernandez, 2004).

Some further **general (organisational or system-level) conditions** also influence whether teachers are willing even to "try out" and then continue using LS as a form of their continuous professional development, such as:

- whether they have the **time and energy** to participate in LS;

- whether they have a **collaborative department/team culture**.

Obviously, too much workload and lack of time are major barriers to engaging in any form of professional learning. While these might largely depend on system-level conditions (e.g. number of mandatory class hours, required tasks above teaching etc.), **school leaders can still do a lot** to ensure that teachers doing an LS have enough time to do it (by changing schedules, exempting participants from other tasks etc.), and also, that teachers' time investment is appreciated and credited.

In spite of the general "overload" of teachers, **teacher professional development** in one form or another is expected or even mandatory in most countries. In some educational systems, teachers are required to "collect" a certain number of credits within a certain time, primarily through participating in formal in-service training courses. In others, less formal types of activities such as participating in educational development projects, educational conferences or short industry placements are also recognized forms of teacher professional development. In some countries, teachers are even afforded dedicated time built-in their schedules when they can do PD activities alone or in collaboration with colleagues. (If you are interested in the PD practices and requirements of VET teachers in other EU countries, you can read about it in this Cedefop report and the related national reports.)

Since Lesson Study is an activity based on collaboration, teachers' motivation for engaging in LS also depends on their prior experiences in and attitudes towards working together with their colleagues. A **collaborative team culture** is one in which teachers are used to discussing and sharing their ideas, experiences, or concerns with colleagues, giving and asking for advice, or maybe even planning and co-creating together. However, collaboration and collegiality may not always be conducive to teachers' professional development and innovation. Little (1990) urged paying attention to both the variable form and content (the collectively held beliefs, ideas and intentions) of collegial relations, as these may lead to very different consequences: conserving the present or promoting change. She distinguished four ideal types of collegiality that reflect increasing degrees

of interdependence among teachers and "*present changes in the frequency and intensity of teachers' interactions, the prospects for conflict, and probability of mutual influence*":

- *Storytelling and Scanning for ideas* involves opportunistic, sporadic and informal exchange between teachers, at some distance from the classroom, not necessarily focusing on pedagogical matters; here teachers gain information and assurance in the quick exchange of stories, but collegial relations depend only on social and interpersonal interests;

- *Aid and Assistance* refers to the ready availability of mutual aid or helping, which, due to the inherent psychological and social costs of asking for or accepting help (loss of self-esteem and status), also may rather sustain than alter the traditional individualistic culture;

- *Sharing* means routine sharing of materials and methods or the open exchange of ideas and opinions through which teaching can be made more public, the collective pool of ideas and methods expanded, and coordination of work becomes possible, but the actual impact depends on the form of sharing and the prevailing norms of non-interference versus experimentation; and finally

- *Joint work*, when collaboration implies the interdependence of teachers (shared responsibility for the work of teaching, which is the main motivation for their collaboration), collective conceptions of autonomy, support for teachers' initiative and leadership, and group affiliations grounded in professional work.

Doing a Lesson Study is indeed one form of such joint work, when teachers collaborate towards a common goal, depending on each other's work and contribution. Since it is based on the voluntary collaboration of teachers, it also avoids the pitfalls of "contrived collegiality" (Hargreaves, 1994), when collaboration is administratively regulated and controlled, compulsory and implementation-oriented, which does not contribute to the development of teachers' professionalism and may have detrimental effects. Collaborative team cultures that enable successful LS are characterised by a relatively high level of trust and good interpersonal relations. They make a safe professional environment in which teachers are not afraid of sharing their problems and failures, nor of conflicting their professional views as part of professional discussions and development. LS leads to productive conversations about teacher practice only if teachers can negotiate the balance of politeness and critical honesty (Chokski & Fernandez, 2004).

While doing a successful LS is dependent on a collaborative team culture, doing LS also **contributes to** developing the collaboration skills of participants. The uniqueness of the LS4VET Model is that it is built on the idea of **boundary crossing** between different teacher and teaching practices (e.g., teachers of vocational subjects and teachers of general subjects, teachers of VET and the industry), and thus it involves collaboration with teachers and experts or practitioners from the industry with whom they had never before worked together.

Organisational support

Lesson Study for VET (LS4VET) can be sustained in a school only if:

- the **school leaders** understand LS4VET properly, recognize it as a valuable form of teachers' professional development and are committed to its sustained use in the school; and

- the **cultural and structural conditions** in the school allow LS4VET to become embedded as an "organisational routine".

Research has found that school leaders' educational beliefs are critical to the quality and fidelity of the implementation of LS as these influence their understanding of its general idea (Boom-Muilenburg et al., 2021, Wolthuis et al., 2021a, 2021b). Leaders' student- and collaboration-oriented beliefs are crucial for continuing the work of LS in a school. The 2nd step of the LS cycle, studying data, publications and lesson materials, which enables in-depth reflective professional inquiry, may be omitted due to leaders' holding researcher-oriented

beliefs about educational research as opposed to practitioner-oriented ones, or because of the organisational context, which mediates whether leaders can act on their beliefs.

School leaders play a critical role in providing **administrative-logistical support** for teachers, which includes:

- crediting teachers' time investment,

- rearranging teachers' schedules, and

- providing the financial and other resources required for teachers to do LS.

To ensure that the organisational preconditions are set up in a way that is functional and useful, it is vital that **school leaders and teachers make time to communicate and collaborate** about the required organisational work and carry shared responsibility for setting up the organisational tasks and processes (Wolthuis et al., 2020b). Saito et al. (2015) argue that LS should be conceptualized as a comprehensive vision and framework of school reform, which requires that the ways of management and leadership should also be included as objectives. They explore the idea of Lesson Study for Learning Community (LSLC) and suggest that reform for the culture of the school is needed in order to change learning levels among the children, teachers and even parents. Sustainable educational innovation is not only about facilitation in time and resources, but also concerns (internal and external) support, a well-informed school management and a vision about the intervention (NRO, 2018).

In the LS4VET Model, we recommend that once one or two teams of teachers have already done a few LS4VET cycles, in collaboration with the school leaders they create a **Meta School LS4VET community** (MSLC).

4.5.3 CREATING A META SCHOOL LS4VET COMMUNITY (MSLC)

In some countries where Lesson Study is widespread, there is a specific school organization that brings together LS work in the given school and links LS4VET teams with the school as an organization. The school organization that organizes and brings together the activities of the LS teams in the school is called Meta school LS4VET community or **MSLC** in our LS4VET Model.

Organizing a Meta School LS4VET community

Irrespective of the management style of the school, it is highly recommended to convince the school management of the need to set up a MSLC.

MSLC acts as a bridge between the school as an institution, the school management and the LS4VET teams in terms of supporting the LS4VET teams and managing the innovations that can be created by these LS activities. It links the present LS4VET team activities to the realities of the school's traditions and even more to the future of the institution, thus also promoting the continuity of the LS4VET teams' activities and the sustainability of the innovations they create.

In order to carry out these tasks, the recommended size of MSLC is 4-6 people, including:

- one person from the school management

- one person from a general school subject department

- head of a VET subject department

- a teacher who is familiar with LS

- a teacher expert in pedagogical innovation

- an administrative staff member for supporting logistical issues.

Thus, MSLC integrates the school management with members of the middle-level management and practising teachers and covers all the necessary activities.

Some schools have so-called innovation LS4VET teams. If the school has such a unit, it can be further developed to meet the objectives, functions and scope of MSLC described here.

Main tasks of the Meta School LS4VET community

➔ support the organisation of LS4VET teams in the school

➔ coordinate the organisational-level activities of LS4VET teams in the school:

- coordinate the harmonization of the work of the LS4VET teams with the pedagogical development objectives of the school;

- coordinate the LS4teams' activity with each other;

- ensure logistical support;

- ensure the provision of the necessary financial and other resources.

➔ support the LS working group regarding issues with group dynamics, if necessary

➔ support the inter-school professional contacts of the LS4VET teams, if necessary or required, and provide the institutional background for this

➔ provide the necessary institutional support for the invitations and reception of invited guests

➔ actively participate in working sessions in which an LS4VET team requires it (e.g. observation and analysis of the research lesson)

➔ ensure that a portfolio summarising the work of the LS4VET teams is produced and made available to the school's teaching community or wider community of interest

➔ analyse the pedagogical developments generated by the LS4VET teams in terms of the extent to which the innovations can be used at institutional level

➔ if an innovation has been created by an LS4VET team that can be used institutionally in the long term, it works towards ensuring its long-term institutional exploitation.

➔ In terms of the 7 steps of the LS4VET cycle, the tasks of the MSLC are as follows:

Step 1 - Organize the team, set the goals

Coordinate all LS4VET activities taking place or planned in the school, harmonize the topics to be chosen by the teams, even make suggestions about the composition of LS4VET teams. If required, assist teams in choosing LS4VET topics by, for example, sharing results of previous LS4VET teams, and connecting individual teachers interested in LS4VET to form LS4VET teams.

Step 2 - Study alone or together

A member of MSLC, who is familiar with LS and/or an expert in the chosen pedagogical topic or a practitioner in the vocational field can become an LS facilitator or a knowledgeable other (A) or (I) in a LS4VET team.

Step 3 - Plan the teaching unit

In case the knowledgeable other in the LS4VET team is a member of MSLC, he/she will participate in this Step in the same way as if the knowledgeable other in the LS4VET team were an outside person.

Step 4 - Research lesson: teach and observe

The MSLC can provide support in the logistics of the research lesson, and one or more members of this community can participate in the observation of the research lesson in the same way as any other LS4VET team member.

Step 5 - Analyse and discuss

In case one or more members of the MSLC participated in all previous activities of the LS4VET teams or at least in the observation of the research lesson, it is important that they participate in the analysis and discussion of the research lesson the same way as the LS4VET team members.

Step 6 - Repeat

In case one or more members of the MSLC have been involved in the LS4VET team's previous activities, they may participate in the planning, observation and analysis of the new research lesson in the same way as the other members of the LS4VET team.

Step 7 - Reflect and disseminate

The MSLC can play a crucial role in the dissemination of the results of the LS4VET team in and out of the school, and by this it can play a crucial role in the sustainability both of the research results and innovation of the LS4VET team, and the LS4VET activity itself in the school. The more continuous the LS4VET activity in the school is, the more continuous and variable dissemination activity the MSLC can do both inside and outside the school. The opportunities for this can be developed according to local conditions, starting with simple methods such as entering the LS4VET teams' portfolio in the school library or uploading it to the digital communication system of the school. These can be followed by more complex activities like whole-school programmes for introducing the new LS4VET results for the whole staff, or between-schools programs in the local educational district, even publishing the teams' results in professional periodicals, or on national or international professional digital platforms etc.

What the Meta school LS4VET community is not responsible for

While, as can be seen, the existence of a MSLC in the school is highly recommended for the creation, functioning, management of results and sustainability of LS4VET activities, it is worth pointing out some of the things that are not the responsibility of the MSLC.

→ MSLC is not responsible for controlling the staff composition of LS4VET teams.

→ MSLC does not have to exercise professional supervision and close control over the activities of the LS4VET teams. In the activities of LS4VET teams, there is always the possibility that the team will ultimately conclude its work unsuccessfully: it will fail to find an appropriate solution to the chosen issue. However, MSLC must not lose sight of the fact that LS4VET activity is essentially research and, in connection with this research, development: there is no scientific research or research and development activity that is guaranteed to have a tangible output that is proven to be working everywhere and every time. However, it is crucial for the activities of those carrying out research/research and development that they have sufficient intellectual and professional freedom to deal with the pedagogical issues they wish to research and develop, otherwise they cannot carry out creative and innovative work.

→ MSLC doesn't have to offer financial background for costs necessary for the LS4VET team to exercise control over its activities. These costs are usually negligible compared to the overall costs of a school anyway.

➜ MSLC does not have the task of managing conflicts within the LS4VET team, although it can be involved in conflict-management if requested by the team members themselves.

Diagram 1 from our LS4VET Model report (Khaled et al., 2021) presents the main functions of the MSLC.
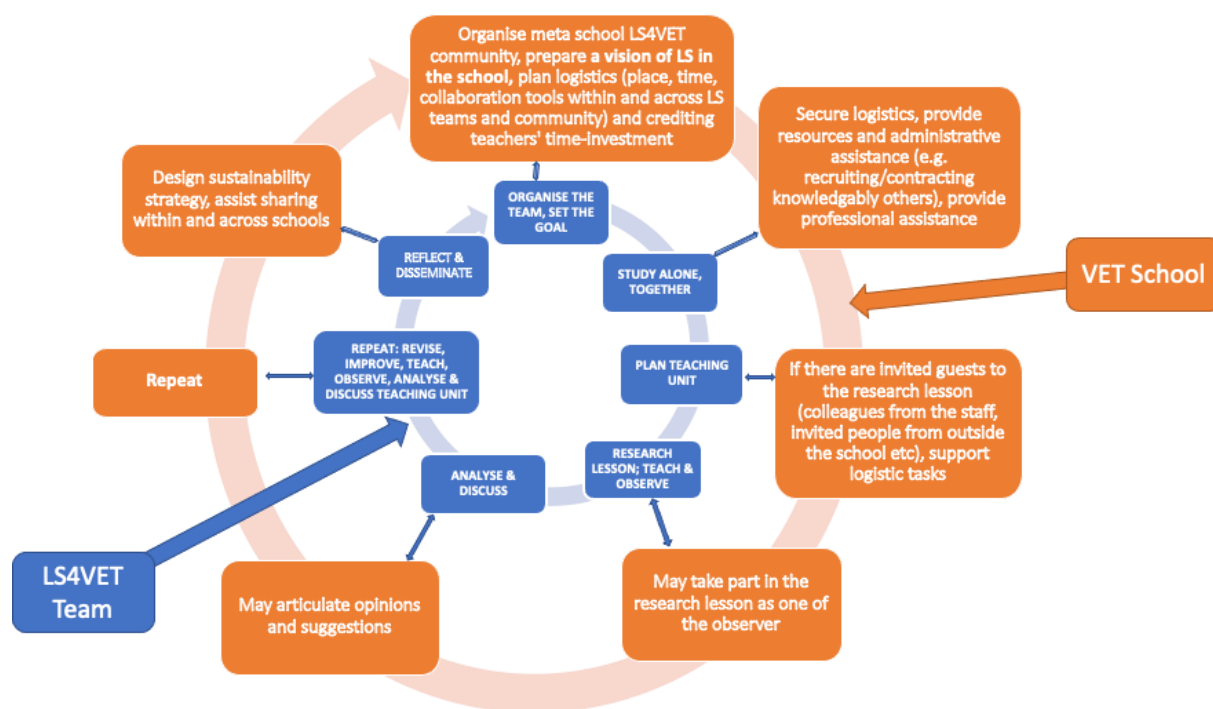

Diagram1: The main tasks of the Meta school LS4VET community (MSLC)

4.5.4 CREATING AN LS4VET STRATEGY

It is recommended that the ground rules of collaboration within MSLC and its main functions are discussed and agreed upon in a written document, the school's LS4VET strategy. This short written document describes:

1. the **vision** of using LS4VET in the school as a preferred form of teacher professional development (what is expected of LS, how it is related to the school's vision), and

2. the related **administrative and logistical processes and tasks** (forms of crediting teachers' time investment, organisational processes and tasks related to LS4VET, and the ground rules of collaborating in MSLC).

4.6 COLLABORATION, COMMUNICATION AND CONFLICT RESOLUTION AT TEAM LEVEL

4.6.1 INTRODUCTION

One of the most important features of the LS4VET team functioning is that it is a horizontally organised group (flat team): group members enter the group and collaborate with each other on the basis of their own choice, and they have the same opportunities in all aspects of collaboration, such as communication and actions. In theory, no one is the boss of the other. In this type of group organisation, many people hope that the horizontal

nature of the group organisation is so much about unity and cooperation that it inherently contradicts the possibility of vertical organisation, and that the principle of equality precludes the possibility of conflict.

However, there is no human organisation in which there are no vertical elements, and there are no horizontally organised human groups in which there are no conflicts. In many ways, the effectiveness of LS4VET as a horizontally organised LS4VET team depends on how the members of the group deal with the vertical team elements that are or will necessarily arise, and how conflicts are managed.

Doing Lesson Study involves many tasks related to the organisation of the work of the LS4VET team and their collaboration and communication with the larger school community. If the LS facilitator is a teacher employed in the school, many of these tasks can be carried out by her/him (the tasks of the LS facilitator related to LS cycle are described here). However, often the LS facilitator is an outsider (possibly a Knowledgeable Other from academia), in which case s/he does not have direct relations and contacts with the school community and leaders. In such cases there is a need for one or more teachers within the LS4VET team to perform these tasks. Practice shows that often one teacher of the LS team informally or formally becomes a spokesperson undertaking these tasks and functions.

4.6.2   COORDINATING THE WORK OF THE LS4VET TEAM

In this section, we list the tasks related to the organisation of the work of the LS4VET team and their collaboration and communication with the larger school community. These can be carried out by either the LS facilitator and/or the informal/formal spokesperson of the LS4VET team, depending on whether the LS facilitator is an outsider or not:

- organize team meetings and online communications and the logistics of the Lesson Study research lesson;

- negotiate with the school leaders about the resources and support requested by the team;

- ensure that the agreed pedagogical goal remains the focus of work;

- support the LS4VET team's work to improve the ways teachers can learn about teaching through research and development (to improve student learning);

- support and encourage all team members' work, especially those who are new to the LS4VET team or have never been active as LS team members;

- takes every opportunity to maintain and strengthen the mutual respect and trust as the basis of team cooperation;

- liaise with the school leaders and, if there are any, with other LS4VET team members within and outside the school;

- pay attention that all her/his activities and communications be transparent and can be monitored by the team.

4.6.3   CONFLICT RESOLUTION

Human cooperation, including teamwork, always involves - or at least has the potential to involve - conflict. Two types of conflict are worth distinguishing here:

(1) conflicts in pedagogical views, beliefs, regarding the solution of the chosen pedagogical problem (research topic of the Lesson Study)

Differences in pedagogical views, beliefs and opinions regarding the solution of the pedagogical problem or research topic chosen by the LS4VET team should be seen as cognitive dissonance between group members (Mynott, 2016) and thus as a fundamental feature stimulating collective creativity in finding a solution, rather than as a conflict in the most common sense of the word. In this respect, the team leader should take care to ensure that the clash of views is not partisan, i.e. that it does not stall, but rather moves the collective work towards creative, innovative professional practices. It is also worth communicating that the dissonance of views is really a dissonance between views and not a conflict between persons.

(2) personal conflicts affecting the way work is done

These are different in nature from dissonances in pedagogical views because they can become destructive and can block the team's work.

Although there are numerous studies on conflict resolution in the pedagogical literature, the vast majority of them focus on the teacher-student relationship; descriptions of conflicts that arise in teachers' collaboration and the ways in which they can be resolved are rare. Here we give some very simple general advice:

- the team leader should ensure that the members of the LS4VET team agree at the outset - and may even put this down in writing—how they will deal with any interpersonal conflicts that may arise;

- if interpersonal conflicts are not yet too deep, try to shift the focus back to the pedagogical problem; this is in line with the fact that LS focuses on the pedagogical issue rather than on the individuals (for example, during the research lesson, the focus is not on the teacher who is conducting the research lesson, but on the teaching activities developed jointly by the team);

- in the case of deeper conflicts, it is better to involve a professional (school psychologist, school counsellor, etc.).

Although it rarely happens, it must be accepted that sometimes interpersonal conflicts do not resolve themselves. In such cases, one or all the teachers in conflict with each other may leave the LS4VET team or, even if they do the LS4VET work, they may not start LS4VET in other groups.

4.6.4   TEAM COORDINATION

Since one of the main characteristics of LS is that teachers work together and collaborate as equals, many people think that they will find a working environment in an LS team where there is no leadership and no conflict. However, there is no social human activity in which hierarchical relationships do not develop spontaneously or in a direct way, and there are no shared human activities in which disputes and disagreements do not develop openly or covertly. In fact, this is what LS is all about: for teachers to discuss with each other professional topics, concerns and challenges, about which they necessarily have different ideas, and from these differences to understand those pedagogical phenomena in different aspects, and at the same time to learn how they can ultimately develop from these different approaches, interpretations and ideas some kind of common practice. The success of the LS4VET team thus depends not on whether the working relationship between teachers remains horizontal in all its aspects, or whether they can avoid conflicts and disagreements during their collaboration, but on how they can manage the spontaneous or intentional vertical relationships that characterise their LS4VET team, and how they resolve the unavoidable conflicts that arise during the work processes.

Selection/election of a spokesperson

Some LS4VET teams decide to choose a spokesperson for themselves. In other groups it is more of a spontaneous process that the group considers someone as the quasi-leader of the group. In the former case, the group members choose the teacher who will act as their spokesperson in accordance with some commonly agreed

principles and processes. The latter is a spontaneous group process. In either case, the spokesperson is sometimes the same person who suggested or initiated the formation of the self-organised LS4VET team, and sometimes it is the person who came up with the research topic for the team. This is natural, since in such cases it is the person who actually started to motivate the colleagues to organise the LS4VET team in the first place, or who found a topic to attract other teachers to the team, arousing their professional interest. So we can say that this teacher is so obviously motivated to pursue the LS4VET activity that it is a good choice for the other teachers to accept/consider her/him as the spokesperson of their team.

However, the LS4VET team does not have to be organised exactly in this way. A lot depends on the working culture of the school, whether team members have worked together before and have an established pattern of collaboration or whether they are working together for the first time. Groups can also work effectively without a fixed quasi-leader, but with an agreed system of teachers taking turns of acting as the spokesperson.

Skills required of a spokesperson

Ideally, the LS4VET team spokesperson should be someone who

- holds the professional respect of his/her team members

- has good organisational skills

- is a good communicator

- is effective in managing team processes

- is effective in advocacy

- is able to place current team activities in a longer-term professional vision.

A. Professional respect

Professional respect should be based on good knowledge and a convincing amount and quality of experience in the subject area and research topic chosen by the LS4VET team.

B. Good organisational skills

The work of the LS4VET team involves a lot of organisational tasks, both large and small. This can be done by the **LS facilitator** (especially if s/he is a teacher employed in the school), but many teams decide that it is easiest if these tasks are done by the person who implicitly or explicitly organises the whole LS team activity, quasi or explicitly leading it. In case the LS facilitator is an external expert, such administrative and logistical tasks should be carried out by the LS4VET team spokesperson.

C. Good communication skills

The LS4VET team spokesperson must have good communication skills, because her/his role is double folded: despite the fact that practically she/he is functioning in the LS4VET team as a spokesperson, s/he is also one of the team members with the very same rights and position as the others have. This complicated situation needs a kind of well-developed and sensitive style in communication.

D. Effective management of team processes

Practice and experience help a lot in managing group processes, so it is better to have a more experienced teacher than a beginner as a team spokesperson.

E. Effective advocacy

The LS4VET team is doing complex and innovative work within the school. In doing so, non-predictable situations may arise when the interests of the team need to be promoted or advocated in front of school leaders or other

staff members on unplanned issues. It is also good if the spokesperson can communicate effectively with the parents or the students.

4.7 ASSIGNMENT

You will compile **one** portfolio in your LS-team containing

   a)   a strategy for the sustainability of LS4VET in your school (1000 words),

   b)   a plan for the continuous dissemination activity of your school related to LS4VET (500 words), and

   c)   a collaboration, communication, and conflict resolution plan for your LS4VET team (500 words).

These documents will be created in group work

Each team member will add the outcome of their individual reflections recorded in their personal blog. Participation in Forum discussion will also be counted towards successful completion of the module.

Submission: End of week 3 in one pdf document per team here

Evaluation: Assessment is based on a 4.0 criterion-oriented scale (see Appendix).

4.8 TASKS

4.8.1   REFLECTIVE ACTIVITY 1

Please reflect on these questions briefly in your personal blog.

   1.   What is your school's vision and mission (may be formalised in a statement of the school)?

   2.   What is the leadership style like in your school?

   3.   What is the management structure in your VET school?

   4.   How do you think your school leaders think about teacher professional development and educational research in general, do you think these are in line with the general idea of Lesson Study?

4.8.2   REFLECTIVE ACTIVITY 2

Please reflect on these questions briefly in your personal blog.

   5.   Rank the steps that you found were the easiest and the most challenging to cooperate with the school management and briefly explain why.

   6.   How do you think the difficulties that you faced could be solved?

   7.   What further suggestions would you have regarding cooperation between the school leadership and the LS4VET team before the start of the LS4VET cycle or during steps 1-7?

4.8.3   FORUM DISCUSSION 1

Please participate in the Moodle Forum discussion started by your e-tutor, reflecting on your experiences on how leaders in your school supported your LS4VET activities and sharing good practices.

4.8.4   REFLECTIVE ACTIVITY 3

Please reflect on these questions briefly in your personal blog.

1. How would you describe your school, in what aspects and to what extent does it show characteristics of a learning organisation?

2. Analyse the possible constraints of organisational learning by LS4VET in your school and think of some possible solutions for them.

4.8.5   REFLECTIVE ACTIVITY 4

Please reflect on these questions briefly in your personal blog.

1. What similarities and differences do you see between human and organisational learning?

4.8.6   QUESTIONS/ACTIVITIES FOR F2F MEETING 1

1. Watch this video from 6:08 until 6:56. Discuss the school leader's strategy on the institutional aspects of LS.

2. None of the authors we referred to in section 4.4.3. mention the students' possible roles in organisational learning. Prepare a mind map figure on the (possible) roles of the students during the LS4VET cycle in a school which is a learning organisation. In the core of the mind map there are the *students* (as collaborators in LS4VET as organisational learning). Repeat the same considering the possible role of students.

3. Can you mention some concepts and practices in teaching in your school that you think would be worthwhile to change by new, more relevant and effective concepts and methods? Which are the push and pull factors to change or not to change them. How could the constraints be solved?

4. Start working on Task 1.

5. Plan Week 2 (finalising Task 1).

4.8.7   TASK 1

Based on what you learnt in this chapter and your reflections on your LS4VET experiences, in group work prepare SWOT analysis[3] of doing and sustaining LS4VET in your school.

Deadline: F2F meeting 2

Submission: Submit your SWOT analysis in Moodle (click here to submit the task)

4.8.8   REFLECTIVE ACTIVITY 5

Please answer these questions briefly in your personal blog BEFORE you read the following paragraphs.

- Do you plan to do a Lesson Study again with your colleagues? If you do, what motivates you? If you do not, why not?
- How do you think your colleagues, who have not yet participated in this course nor in any LS before, could be motivated to do one?

4.8.9   REFLECTIVE ACTIVITY 6

Please answer these questions briefly in your personal blog BEFORE you read the following paragraphs.

- Was your participation in your Lesson Study for VET recognized or awarded in any form?

- Did your attitude towards and opinion about collaboration change as a result of participating in an LS? Can you mention any insights or skills you have learnt/developed regarding collaboration?

4.8.10 REFLECTIVE ACTIVITY 7

Please answer these questions briefly in your personal blog BEFORE you read the following paragraphs.

- What kind of support did you get from your school for doing LS4VET?

- How do you think LS4VET could be more effectively supported in your school?

4.8.11 REFLECTIVE ACTIVITY 8

Please answer these questions briefly in your personal blog.

- Which steps of the LS cycle do you think are those in which the MSLC can play a role even when the school management is not or not necessarily active?

- Is there an institutional innovation working team or any similar already in your school? If so, do you think it could be adapted to serve the functions of MSLC?

4.8.12 QUESTIONS/ACTIVITIES FOR F2F MEETING 2

1. Present your finalised SWOT analysis (Task 1).

2. Work on Assignment 1.

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[3]In SWOT analysis a certain phenomenon is identified from 4 perspectives: strengths, weaknesses, opportunities, threats. The 4 perspectives are typically represented by a matrix of 4 fields. See more Keany (2017).

3. Plan Work 3 (working on Assignments 2 and Assignment 3).

4.8.13 ASSIGNMENT 1

In group work, create a LS4VET strategy for your school (portfolio item 1).

Deadline: end of Week 3

Submission: Moodle (click here to submit the task)

4.8.14 ASSIGNMENT 2

In group work, create a plan for the continuous dissemination activity of your school related to LS4VET (portfolio item 2).

Deadline: end of Week 3

Submission: Moodle (click here to submit the task)

4.8.15 FORUM DISCUSSION 2

Please participate in the Moodle Forum discussion started by your e-tutor, reflecting on your experiences on what worked well and what difficulties and conflicts emerged in your previous teamwork while doing LS4VET in your LS4VET team and what solutions did you choose to try.

4.8.16 QUESTIONS/ACTIVITIES FOR F2F MEETING 3

1. Present your Assignment 2.

2. Watch the video from 9:25 until the end and analyse the team communication. Based on their communication, are the teachers in a horizontal or a vertical relationship with each other? Pay special attention to the vice principal's communication!

3. Work on Assignment 3.

4.8.17 ASSIGNMENT 3

In group work, create a collaboration, communication, and conflict resolution plan for your LS4VET team (portfolio item 3).

Deadline: end of Week 3

Submission: Moodle (click here to submit the task)

5. 21ST CENTURY TEACHING METHODS — FOCUS ON DIGITAL WORLD

5.1 DESCRIPTION OF THE MODULE

5.1.1 AIM

The rapid changes in technology and labour market as well as the learning needs and attitudes of students require a shift towards learner-centred, active teaching methods in VET. Closed sets of professional knowledge and skills are no longer enough, companies of the digitalised economy need workers with a wide range of skills and the ability of life-long-learning. Vocational schools are forced to respond quickly to upcoming demands, which requires them to change traditional knowledge transfer and assessment Practice into learner-centred, participatory learning-teaching activities supported by digital tools and open educational resources (OERs).

The goal of this module is to prepare VET teachers for integrating innovative classroom management techniques and teaching methods into their daily practice through Lesson Study. They will be able to use digital tools for increasing the responsibility of students for their own learning outcomes and develop their 21st century skills including communication, collaboration, critical thinking, and creativity effectively in their academic and professional learning.

5.1.2 ENTRY REQUIREMENTS

Completion of Modules 1-3.

5.1.3 CONTENT

- Active learning/teaching methods in the VET classroom

- Virtual learning environments in VET

- Open Educational Resources in VET

- Pedagogical potential of digital tools for VET

5.1.4 GOALS

The participants…

- are able to create a plan for a Lesson Study research lesson with the goal to analyse the effectiveness of one of the active learning/teaching methods in the VET classroom.

- are able to define the concept of virtual learning environments (VLE), to explain their key features and services and to analyse their support for teaching and learning in VET schools.

- are able to develop a concept for using Open (or integrating) Educational Resources (OER) and relevant resources and to describe how they can be reused in VET classroom work for promoting digital equality.

- are able to describe the pedagogical potential of digital tools, to explain how they are used to achieve the didactic goals of Lesson Study research, teaching, and learning in VET contexts, and to analyse their effectiveness in inclusive learning.

5.1.5   LEARNING OUTCOMES

The participants…

- describe advantages and challenges of active learning methods and explain new roles of VET teachers.

- know 21st century teaching and assessment methods relevant to the age group, subject/topic, and the didactic aims of the lesson.

- develop research lesson plans collaboratively by applying selected 21st century teaching methods.

- describe advantages of using virtual learning environments with students in case of face-to-face analog and digital classroom work.

- know national and European (online) OER databases and search for OERs for the subject/topic of the lesson.

- know digital tools for making classroom work more effective aligned with the learning goals and didactic aims of the lesson.

5.1.6   ASSESSMENT

Successful completion of the module requires:

- active participation in e-learning and completion of course tasks (individual and group work, 30%)

- draft concept of a research lesson plan applying a selected active learning method (group work, 40%)

- selection and/or development and implementation of digital tools and OERs (group work, 30 %)

Submission of the assignments will be based on a well-structured template with rubrics to fill out and questions to be answered in group work.

Assessment is based on a 4.0 criterion-oriented scale (see Appendix).

5.1.7   DURATION OF MODULE, ESTIMATED WORKLOAD AND MODE OF DELIVERY

3 weeks

1 ECTS

20% e-learning

50% self-study

15% digital face-to-face collaboration

15% analog face-to-face collaboration

5.2 NAVIGATION BY ICONS

	Course component	Explanation
	Page	The icon represents a simple document, for reading, like: • General information about the course • Learning guides • Structure of the course • Bibliography
	Forum	When you find a question to discuss with others, or you face problems in the learning environment, please visit the forum!
	Moodle e-Book	This icon represents longer learning content structured in e-book with interactive navigation tools and the table of content. The learning content of module 5 is included in such an e-book.
	Assignment	Clicking this icon you will get a detailed description on the assignment, you have to submit it here in the learning environment. Your e-mentor will assess your work inside the platform, and the system will send you a message about it.
	Feedback	By clicking this icon you will be asked to evaluate the module, to give your feedback about your experiences.

5.3 INTRODUCTION TO THE MODULE

The course is dealing with Lesson Study methodology, which is a less-known method of developmental collaboration of teachers in VET in which the use of digital tools is unavoidable. This module seeks to provide insights into how digital technology can be used to support active learning methods to improve the quality of learning.

In the first part of the module, we briefly map out 21st century demands for vocational training. In the second part we deal with active learning methods and their versions adapted to the digital era, through examples that can be used in vocational education and training.

To find their way among the multitude of digital tools has become an increasing challenge for educators. It is a real race against time: to find the latest opportunities, to choose the tool that best suits the age of the students and the subject, to learn using it confidently, to create digital content, to design how to apply it in class.

How can open educational resources help this? What are the considerations when choosing a digital tool? Is there a tool that works well in curriculum development, collaboration, and in the classroom? In the third part of the Module, we try to find possible answers to these questions.

This module is optional, however fundamental changes in pedagogical approach towards active learning methods and using digital tools in the classroom is no more optional.

5.4 RESPONSIVE VOCATIONAL EDUCATION

The accelerated speed of technological developments, the proliferation of robotics, automation, artificial intelligence, and highly complex digital systems have brought about much deeper and more radical changes than the previous industrial revolutions.

What does this „acceleration" mean? It took 200 years before printed books became widespread. The internet took 50 years, the mobile phone was available to all of us 5 years after it was invented. How could be able the education system keep pace with that?

With the occupational competences are being in a change, the demand from the side of the labour market has been focused on the need for non-occupation-specific, transferable skills, so-called "transversal skills[4]" necessary for adapting to changes in the workplaces. In 2020, the World Economic Forum[5] published a forecast on the top ten transversal skills, which are expected to be in greatest demand in the labour market in 2025. They grouped the skills into four categories as follows:

Source: own figure, based on the publication of World Economic Forum 2020

"Active learning and learning strategies" (within the self-management category) is in second place in the rank of the top ten, demonstrating that life-long learning has no longer been a utopia, it is a "must". The employees of the near future will be expected to renew their professional knowledge and skills several times during their career if they want to keep their jobs.

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[4] Transversal skills: Skills that are typically considered as not specifically related to a particular job, task, academic discipline or area of knowledge and that can be used in a wide variety of situations and work settings (for example, organisational skills), UNESCO IBE 2013, Global https://unevoc.unesco.org/home/TVETipedia+Glossary/filt=all/id=577 .

[5] World Economic Forum 2020

The WEF forecast was confirmed by the CEDEFOP's analysis (EU Skills Panorama, 2020), finding that the most frequent labour market expectations in job advertisements in 2020 were as follows:

- *working with others,*

- *accessing to and analysis of digital data,*

- *using digital tools for collaboration*, content creation and problem solving,

- *providing information and support to people.*

Source: Skills Panorama (CEDEFOP, 2020)

Vocational schools are asked to give relevant responses to the challenges, and the main areas of the global, European and national strategies and initiatives are in accordance with the requirements concluded both in the WEF and CEDEFOP forecasts:

- **Identifying market needs** and emerging professions (demand side), enhancing the responsiveness to labour market needs (supply side), cooperation with enterprises.

- **Developing transversal skills** such as critical thinking, entrepreneurship, creativity through transdisciplinary, learner-centred, and challenge-based approaches.

- **Applying digital pedagogies** with pedagogical aims in the centre, rather than just using of tools and technologies.

- **Supporting the active participation of students** through personalised, collaborative and project-based learning.

- **Strong lifelong learning strategies** for preparing students to adapt or update skills that their future jobs require.

The "Innovation & Digitalisation" report of the ET 2020 Working Group on Vocational Education and Training of the EU Commission 2020 put "*Teaching & Learning*" into the centre of the action plans for the near future. The new pedagogy, scaffolded by digital learning technologies is emphasized in the report again as urgent organisation level interventions surrounded by the list of areas in the external ellipses where system level interventions are needed.
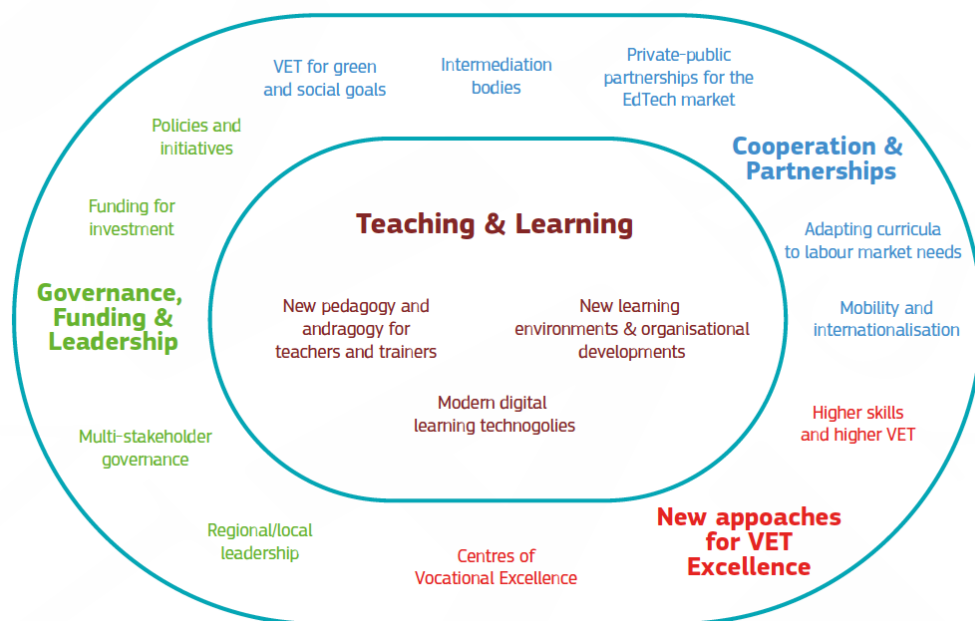
Source: Innovation & Digitalisation

Effective use of ICT tools in education has not proved to be as simple as we thought at the beginning of the computer revolution in the 1990s. The last 30 years clearly demonstrated how difficult it is to achieve fundamental changes in the teaching practice, and the enthusiasm in believing that the technology would be the key to this reform, was a mistake. Till now, all educational stakeholders were aware that it was far enough to equip the classrooms with computers.

In the absence of careful pedagogical planning, digital technology can only reinforce and extend traditional, teacher-centred teaching methods rather than trigger real educational innovation. The problem is much more complex than we thought 30 years ago and the main question is how technology can best support innovative, student-centred pedagogies and active learning has remained till now. (Szűcs, 2018).

„Among all factors in the school environment, teachers are considered to have the greatest impact on students' learning outcomes.... (It is) an obvious yet sometimes forgotten fact: teachers are the cornerstones of our education systems. (Education and Training Monitor 2019)

For the workers of the future, high-level professional skills are not enough to thrive, the labour market requires specific skills to collaborate, continuously self-educate and adapt to technological change.

Learning is the most complex task in human life, and teachers can do much to make it a success. In addition to the traditional transfer of knowledge, teachers are asked to help students to take responsibility for their own learning through innovative methodological tools like lesson study research), they are asked to reflect on your own teaching, and to seek continuously for they can change through joint work and development in line with the expectations of the 21st century, the digital age.

5.5   ACTIVE LEARNING / TEACHING METHODS

5.5.1   PEDAGOGICAL CHANGE BY APPLYING ACTIVE LEARNING

In traditional methods, the teacher is at the heart of the learning process, teaching is a one-way communication process. The teachers are transferring the knowledge from textbooks, the students are listening and repeating,

and their main interest in learning is passing the exam. This approach can and should be changed if the school wants to prepare students to think critically, process information, and adapt to challenges in unknown circumstances.
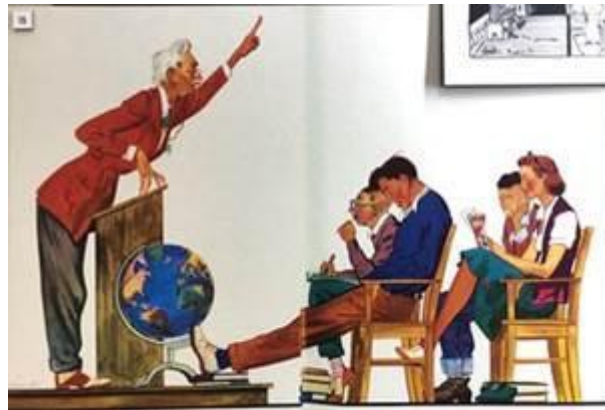
Source: Flickr (UC Berkley, BLUE & GOLD, the 1939 college yearbook)

Activities and ongoing reflections provide more opportunities to develop skills and abilities than passively listening to a teacher's presentation.

"Yet it seems increasingly clear that the chief impediments to literacy are not cognitive in nature. It is not that students cannot learn; it is that they do not wish to. If educators invested a fraction of the energy, they now spend trying to transmit information in trying to stimulate the students' enjoyment of learning, we could achieve much better results." (Csikszentmihalyi, 1990)

When the external control is reduced, students' autonomy and responsibility for learning outcomes increases.

The belief is that what the student does is more important than what the teacher does. The focus is on the student. (Rogers, 1951)

There are several pedagogical methods which support active learning beginning from simple working forms, like group work, till more complex methodologies like flipped classroom method. The main effort of each of them is involving the students actively into their learning process and to make them responsible for their own learning. For the effective use of active learning methods, reform pedagogists have formulated some basic conditions:

- Inclusive and open atmosphere that fosters joy, awakens intrinsic curiosity.

- Learning content based on real-life problems connected to the prior experiences of students.

- Offering opportunities for the students, for practising social and democratic behaviour.

One of the most prominent early proponents of the method was John Dewey, who summarized in his 1897 work "My Pedagogical Creed" why and how to arouse and keep students curiosity and awake to make them feel ownership for their learning.

This video gives an insight to the work of John Dewey[6], titled "My Pedagogical Creed" published in 1897. Please, watch it. It'll take only a few minutes!
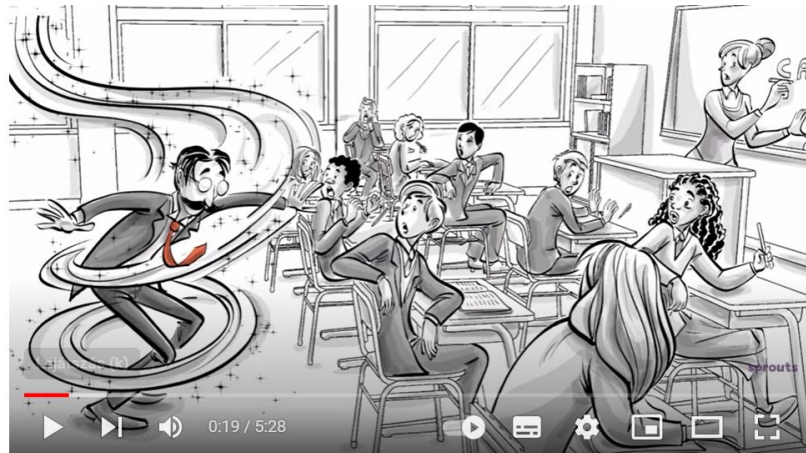
John Dewey's 4 Principles of Education — a video by Sprouts[7]

5.5.2   DISCOVERY-BASED ACTIVE LEARNING

The method is referred by two different names in the literature, depending on the level of autonomy of the students and the extent the teacher(s) is(are) involved into the preparation and implementation:

- Inquiry Based Learning (IBL)

- Research Based Learning (RBL)

Both methods aimed at active participation of the learners, but while in inquiry learning the teacher asks the initiating questions, he/she guides the experiments (discovery) and drawing of conclusions, in research-based learning the students are given more autonomy, independency and the learning process are closer to the steps of scientific research (problem definition, initial questions, formulating hypotheses, conducting experiments, carrying out investigations, collecting and analysing data, drawing conclusions).

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[6]John Dewey (1859 – 1952) was an American philosopher, psychologist, and educational reformer in the first half of the twentieth century.

[7]An enthusiastic small team is sharing free cartoon animations for classroom teachers on the Youtube channel of Sprouts. It is worth visiting, and to patronise the team! (https://www.patreon.com/sprouts). The videos are freely available for teachers and students licensed by CreativeCommons. Read more: https://sproutsschools.com.
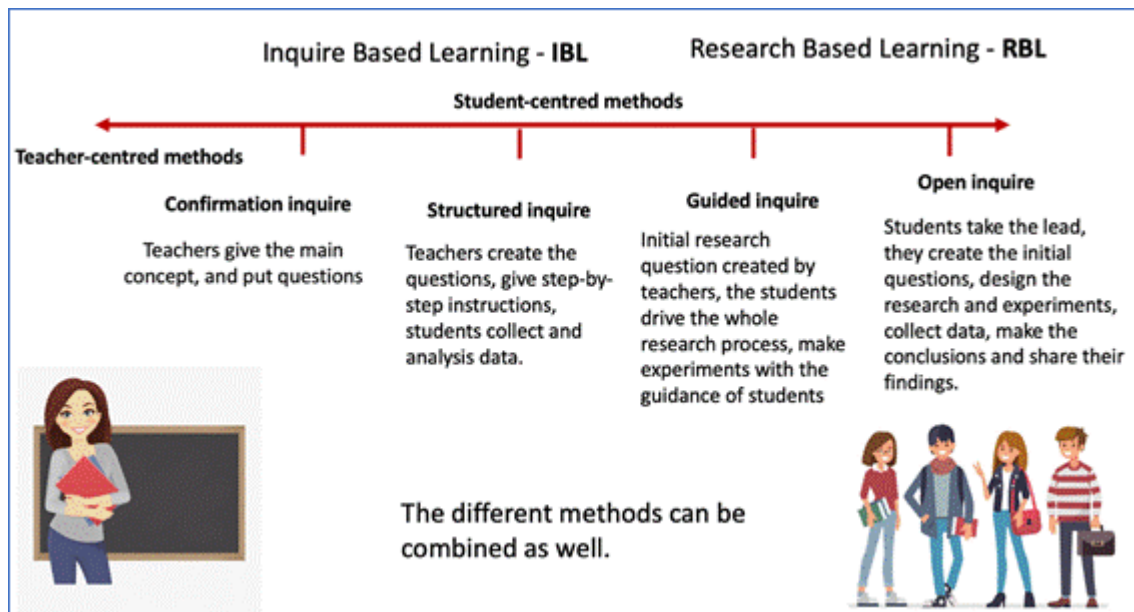
From IBL to RBL

The steps of the process are the same in both methods:

- Orientation, defining the focus - choosing the topic, discussing the problem

- Formulating the concept for the investigation – gathering information, formulating initial questions, hypotheses, designing experiments and methods for the analysis

- Conducting experiments, studies - data collection, data analysis

- Conclusion - evaluation, formulation of results

- Sharing results - publishing the results with wider audience (peers, parents, teachers)

The first step of both methods is the responsibility of the teachers: they have to arouse the curiosity of the learners. In the background is the age-old experience: the children are interested in everything; they are always asking questions. The innovative teacher can awaken this "wanting to know" through the inquiry-based method.

Advantages

- The topic selected by the students will be built on their prior knowledge. Investigation is focused on solving real-life problems, which inspires learners, increases motivation, responsibility for learning and promotes understanding.

- Increasing the students' autonomy and engaging in democratic teamwork.

- Students are active participants, and they experience a sense of achievement through experimentation and investigation.

- A deeper understanding can be achieved of the topic, the students have the opportunity for self-reflection.

- Cooperation improves their social and communication skills, critical thinking, the ability for arguing

- The teacher can better assess the level of knowledge and skills of students and recognise their typical errors.

Challenges

Even though the method itself goes back thousands of years (since Socrates himself used questions to help his students understand the "subject matter"), its application is still counted as an innovation compared to traditional knowledge transferring teaching. Like all innovations, it bears the difficulties of leaving the "beaten track", although it offers real pedagogical success for both the learner and the teacher.

- The use of these methods always requires considerable preparation from the teacher, regardless of which end of the previous diagram, exploratory or complex inquiry-based, is closer. He or she must plan the task very precisely and develop precise criteria for evaluation.

- The other issue, and difficulty, is the integration of time-consuming learning process into the curriculum. The related activities are about flexibility and dynamism, which is difficult to match with a standard curriculum.

List of the digital tools for using together with the method:

Choosing the topic: Mindmap; Google Forms

Discussion, investigation: Google Meet,

Collaboration: MSTeams; Meistertask

Sharing results: Genially; Canva; H5P; Book Creator; Prezi

5.5.3   FLIPPED CLASSROOM METHOD

The flipped classroom is a learner-centred method. "Flipping" approach is that the learning process does not start with the usual teacher explanation, but with the students studying a digital content (video, picture, text) at home before class. The digital content is shared by the teacher before class. In class, they continue to work on the material together or in groups, under the guidance of the teacher.

Experience shows that the method represents a shift from traditional teacher-centred teaching to personalised student-centred teaching.

This approach allows students to learn about the topic at their own pace, and when they arrive to class, they are prepared to join discussions on it. They can apply the knowledge they have gained through active learning at home and will spend the class time with more active and collaborative activities as well.

Like other active learning methods, the idea of the flipped classroom was born long before the 21st century. At the beginning of the 19th century in West Point Military Academy in the USA, students were required to work through the learning content before class and spent the class answering questions and solving problems in groups.

In the 1990s, Eric Mazur, a professor of physics at Harvard University, used what he called "peer-to-peer" teaching" learning methods.

"I started turning the traditional information transfer model upside down. The collection of information is now entirely the responsibility of the students. They need to read the material before class, so the lesson

> *can be devoted entirely to discussion, interaction between peers, processing and thinking. I teach by asking instead of telling" (Mazur, E. 2009).*

Its widespread adoption came only a few years ago, when creating and sharing digital learning content, videos, pictures, digital texts on the internet became available for everybody even with basic level digital competences.

The method was rediscovered by two American high school teachers, Jonathan Bergmann and Aaron[8] in 2000, who decided to record lessons on video, sharing them online with students who were often absent due to their obligations at sports events.

Simplifying Flipped Learning

In this video (6 minutes) Jonathan Bergman gives a short and very simple explanation of how flipping the classroom is linked with the Bloom-model, and how it helps to develop the higher order thinking skills (HOTS) of students.

His explanation makes it clear that the flipped classroom method is not about flipping homework and classroom activities.FC is a possible solution to the fundamental problems of pedagogy: how to motivate students, how to get them interested in learning, how to get them out of passivity. The new generation of students go online several times a day to see if they can find something exciting, they are open to acquire information, just not in the same way their parents used to do it.

In flipped learning the use of digital tools is partly transferred from the community space to the individual learning space. In the classroom, active learning, cooperative and collaborative methods, problem-based learning, and peer learning get more space.

> *"Flipped Learning" is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter." (formal definition by the Flipped Learning Network)*

How to apply?

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[8]Jonathan Bergmann and Aaron Sams initiated the foundation of the Flipped Learning Network (FLN) in 2012, the non-profit organisation and online community of teacher who are interested in FC.

There is no single prescribed way to apply a Flipped Classroom method.

Elementary classroom in Alaska, 2007 (Source: Wikimedia Commons. A teacher in Alaska published by using Creative Commons Attribution 2.0 Generic Licence)

The method presupposes the teacher's pedagogical creativity and unlimited freedom in choosing of tools. However, the community of Flipped Learning Network defined some crucial conditions to start it:

- **Flipped Learning requires flexible environments**. As in-class activities in a flipped classroom can vary from collaborative group work to independent study to research, educators often rearrange the physical space in a classroom to accommodate these variants.

- **Flipped Learning requires a shift in learning culture.**Flipped classrooms shift the focus from teacher-led to **student-centred learning** for learners to experience topics in greater depth through active, more meaningful approaches to learning.

- **Flipped Learning requires intentional content**. Educators evaluate which materials should be presented to students in advance and which content should be taught directly to help students "*gain conceptual understanding as well as procedural fluency*" through constructivist approaches.

- **Flipped Learning requires dedicated, professional educators**. The use of the flipped classroom approach, particularly with the presentation of materials through digital media and technologies, is not intended as a replacement for educators. Class time is crucial for the educator to determine if students have, inter alia, gained understanding of a topic.

Advantages

The flipped classroom model has the potential **to adapt to the needs of diverse learners**. With asynchronous access to lecture material, perhaps in more than one format, students who need time to review information or to pause and process can do so, while students who are ready to move on to the next concept can do so right away.

> *"It is not an exaggeration to classify this as a radical educational innovation, because what is happening here is that education is taking place in the space created by ICT and multimedia technologies, making use of them, significantly transforming the way learning is organised, the way teachers work, the nature of teaching and the way students learn.... An important element of the flipped classroom as an innovation is the redistribution of learning time and energy, and the reorganisation of the division of labour between students and teachers. This is because part of the teacher's work is shifted to the students, and part of the teacher's time is shifted to activities that were previously not done or were done to a lesser extent." (Halász, G., 2016)*

Students can benefit from reflecting on the material through questions and discussions with the teachers and with their peers to solve problems based on lecture content, by demonstrating or arguing their own solutions to classmates and the teacher, by checking their understandings through in class experimentation and lab work, and by peer tutoring or creation of learning objects".

In school, there are many opportunities for activities to promote understanding, such as

- discussing with the teacher and peers around questions,

- solving problems related to the subject matter together,

- presenting and discussing individual solutions with classmates and the teacher,

- joint experiments and laboratory work to check understanding of the subject matter,

- working in pairs on small units of knowledge.

Challenges

Despite the increasing popularity of the flipped classroom model, several challenges have been identified. The teachers are reluctant to apply the method because they feel that they aren't familiar with creating, editing, and sharing videos online.

What are the cons?

- A mobile phone is now often enough to make and share videos, and if the teacher doesn't want to do it, they can involve the students - to further strengthen collaboration.

- During the COVID period, videoconferencing systems have become a daily tool and are an excellent way of making a video recording of a lecture.

- Finally, it is very important to make clear that the digital material given to students before class is not necessarily video. It can be any form of shared, high quality digital content or free educational resource that the teacher finds appropriate for the learning objectives.

The teacher is free to decide how to use the method, and to choose the best individual solution for his/her students, class and subject.

Finally, although the use of technology is closely related to the flipped classroom method, the focus is not on the technology but on the learning goals. Learning and teaching using technology for its own sake, without prior consideration of the pedagogical objectives, will not be very effective with the flipped classroom method.

List of the digital tools for using together with the method:

Video creators: Animoto; Biteable, Canva; h5p; Bandicam; Powtoon

Tasks/tests: Mentimeter; Kahoot; Quizizz, BookWidgets; Symbaloo; Quizlet; Google Forms

Reflections of VET students and teachers
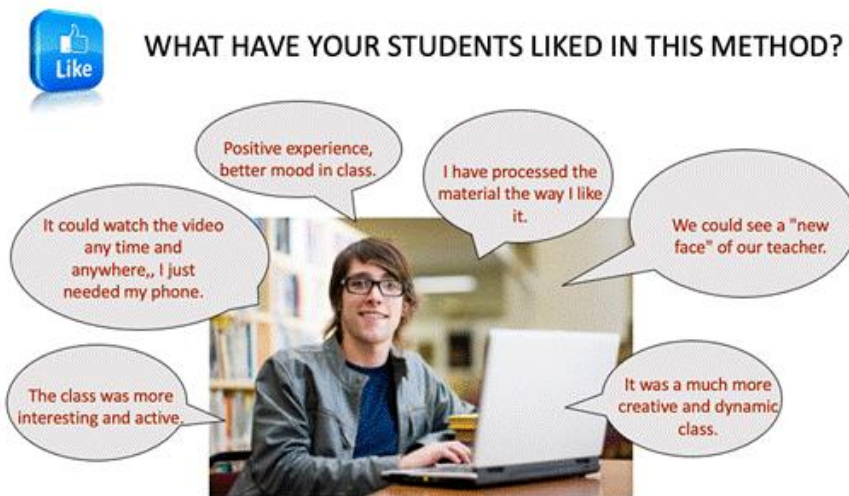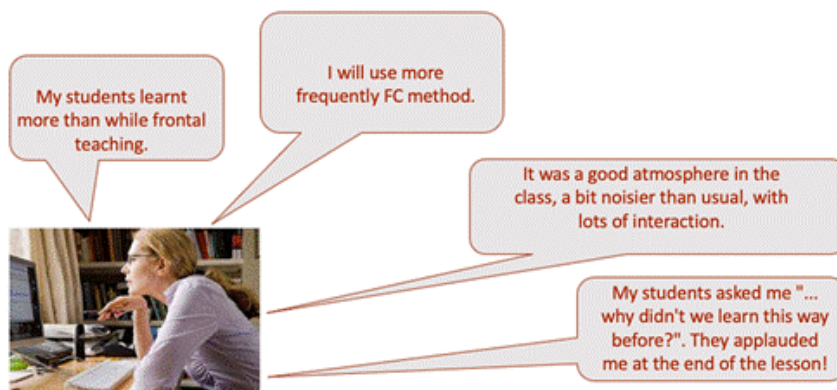
Source: Flip-IT! Erasmus+ project, 2015-2018

Case study

This report is written about an English teacher who didn't create a new video for flipping, but searched for an existing freely available one and transformed it into an interactive solution by embedding quiz questions into it.

School, age group:	Grade 10
Subject:	English language
Topic:	London Attractions

From the lesson plan …	
Approach	Student-centred lesson, connected to the interests and abilities of the students, taking their former experiences into account.
Learning goal	London's landmarks. Students should be able to speak about them in English.
Skills to develop	• *Speaking skills*: students should be able to say in a few sentences what London locations are famous for. Can you answer "Where is it? What is it famous for? How can I get there?" • *Listening comprehension:* extensive comprehension of text, identifying keywords while listening. • *Development of social skills*: students work in groups or couples, help each other. They practise being objective and cooperative in the evaluation.
Method	• *Applying flipped learning connected to the interest and motivation of students (they want to travel to London)* • *Tasks that link the pre-assignment to the lesson and school to reality*
Homework	Learn on London's landmarks by watching the video shared before the lesson
Digital material	An interactive video based on Youtube video "London's landmarks" Digital tool: H5P application Link: https://h5p.org/node/215787.

Reflections and conclusions of the teacher

I did the experiment with a group of 10 students. When I explained the task, they became very curious. In class the students worked in groups. The groups were given cropped images of London, which they had to put together and determine what they saw in the pictures. Then, about the buildings seen in the pictures, the groups had to collect as much information as possible that they could. My aim was to engage the students to help each other, to complement each other's knowledge and to learn from each other. In group work, it was unambiguous who has not watched the short video at home, as questions related to the content seen or heard in the video.

In my experience, the advantage of this method compared to traditional lessons is that students know in advance what we are going to cover in the lesson and can read the published material if they want to. Students said that this kind of task is also good because they have their phone with them all the time and can use it even if they only have a short time, on the bus or while waiting. From the teacher's point of view, the advantage is that they don't have to check their homework in the traditional sense, they don't have to beg to do it because they feel like doing it. Students can utilize and even to develop their digital skills and experience. My students were also interested in how to make interactive videos.

For more information, practical application and real case studies of the flipped classroom method, download this book that has recently been issued in four languages, specifically for **vocational education:** Flipped Classroom in Practice.

5.5.4   PROJECT BASED LEARNING

The problems like, how to get schools closer to the real world, how to motivate students, how to make them responsible for their own learning are with us centuries. One of the teaching methods to reflect on these problems in vocational education is the project-based learning (PBL) which received special attention in the period of the reform pedagogy. In vocational education, where the main goal is to give quick response for the labour market needs, PBL is particularly relevant and useful.
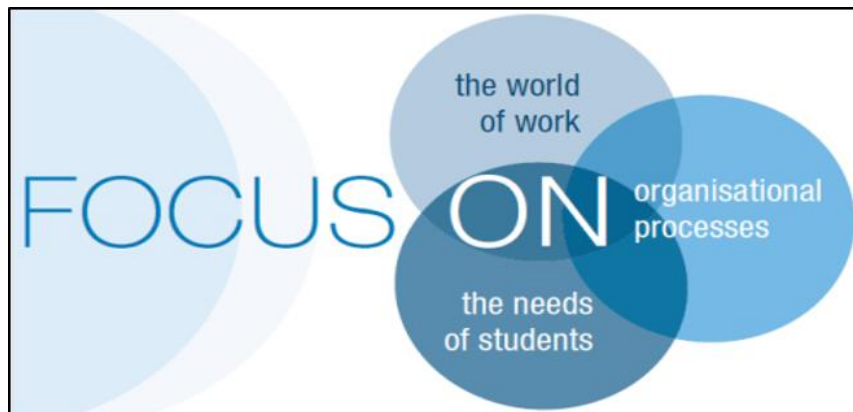
Source: CEDEFOP, 2015

The schools frequently implement their own projects like developing new curricula, building new infrastructure, or starting a collaboration to introduce a new teaching method into their practice. The school leadership needs high level project management skills for operating the organisation effectively, and even teachers do, for instance in classroom management, especially when they are applying active learning methods with their students.

Before dealing with project-based learning, let's give a very short summary about the term "project" itself, which is used everywhere around us. The projects are part of the everyday life of education as well, when the school starts the development of a new curriculum, or a new infrastructure will be established. A project is complex tasks with well-defined objectives in time and space, which can be achieved through coordinated activities consistent with the objectives set and the resources available. It has

- Clearly defined start and end.

- Concrete, measurable results.

- A team involving professionals and managers with predefined responsibilities.

- Planned activities to achieve the objectives.

- Specific time, cost, and performance requirements.

QUALITY

"A project is a unique system of processes with a group of activities undertaken, coordinated, and controlled to meet specific requirements—time, cost, resource—with management tasks and completion deadlines." (International Organization for Standardization, 1994)

The wireframe of the projects is often described by the so-called PDCA cycle adapted by European Quality Assurance for Vocational Education and Training (EQAVET) as well as a cycle for a continuous improvement of teaching & learning process in VET schools.
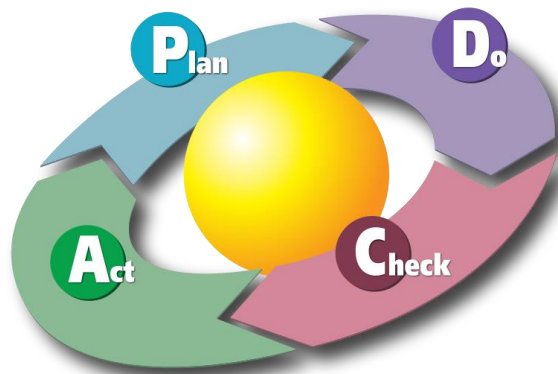
PDCA cycle (Source: Diagram by Karn G. Bulsuk, https://www.bulsuk.com/)

PDCA figure is a visualisation of the repetition of the crucial steps in each project:

- **PLAN**: Goal-setting and planning (building project team, distributing responsibilities and rules, scheduling the activities.

- **DO:**Implementation of results and monitoring according to predefined goals.

- **CHECK**: Analysing for identifying the deviations and revise the results if needed.

- **ACT**: Intervention, planning for improvement and starting a new cycle.

PBL as active learning method

Some parts of features described above are relevant and should be applied in PBL as well, however the projects in PBL are always connected to the pedagogical aims of the curriculum. PBL is for providing new knowledge, developing skills and competences during the teaching-learning process with a special, complex methodology. It is based on a complex pedagogical strategy by placing the students and teams of students into the centre of the learning process, establishing active learning with teachers on the side acting as facilitators. PBL serves as a tool for achieving pedagogical aims.

- PBL serves as a tool for achieving pedagogical aims, so it is strongly aligned with the standard curriculum. It has well-defined goals on the new knowledge to acquire and on the skills and competences to develop by the students.

- The project aim should be related to a real-world problem, and it should be relevant to students' former experiences or their future lives.

- The students demonstrate their knowledge and skills by presenting the results to a public audience by inviting guests from outside the classroom. The assessment of the results and the work of the team members happens by using special methods and is usually public for the team.

- The project in PBL is scheduled precisely following the project plan (like, in any other project), and delivered as a collaborative work of students and teachers. The teachers have significant work in the planning phase, but the main part of the project goes on in a collaboration of students. The students get a pre-approved guideline, and they have freedom to make choices in defining their own project, starting with driving questions around the content they need to learn.

Advantages

Interdisciplinary, multidisciplinary topics need to be processed - it requires complex thinking. In vocational training, projects can also be launched in which students from several professions participate and work on a common topic. The final result of the project is one or more complex products. Students have a high degree of freedom and independence, as they are offered several methods, from which they choose the most appropriate solutions during the implementation.

The project enables a high degree of student autonomy, provides a way to integrate knowledge, get to know the world outside of school, build relationships, and acquire the skills necessary for democratic public life.

Challenges

The implementation of the project may cause a breakdown in fulfilling the requirements of the standard curriculum, it is difficult to fit into the usual timeframe and organisational structure of the school, and it presupposes a new kind of teacher-student relationship.

List of the digital tools for using together with the method:

Planning: Bubbl.us, Mindmeister,

Scheduling, managing: Timetoast, Google Workspace, Meistertask, Slack

Collaborative content development, organising content: Google Workspace, Mural, Wakelet

Online meetings: MSTeams, Zoom

Publishing the results: Prezi, Canva, Blogger

An example of applying PBL

In this project, students studying for "Carpenter of the Wood Furniture Industry" qualification, were asked to prepare a gift made of wood while learning about the different properties of the tree species. Research was carried out for understanding the organic process of photosynthesis, which causes the different properties of each wood species. While making their wood products, they got familiar with a wide range of manual machining from old decorating techniques to CNC. They learnt how to explore and find the material and the solutions to solve the project task, how to identify possible problems, plan the steps of their project and above all they practise working in collaboration and share tasks.

The aim was to get the students acquainted with the concept of measurement in the wood and furniture industry, the SI system of measurement, the concept of measurement accuracy and measurement errors, the measurement of length and its measuring tools. Be able to put these concepts and tools into practice, determine the required dimensions, perform area, perimeter and volume calculations, interpret measured and calculated values, use units of measure and their conversions.

They were asked to plan independently the production operations, to prepare the work area, and to produce the product itself. Be able to create the conditions for safe work, to comply with the regulations, the sequence of operations for the given task.

Students had to select the raw materials by taking the natural and aesthetic values of the materials into consideration. They wrote the figures into a simple text, created a cut-to-measure list, material standard table using Excel spreadsheets.

Steps of the project

1. Forming the project team and distributing the different roles and the responsibilities among them.

2. Defining the aim of the project: production of a nicely decorated chest suitable for a gift.

3. Identifying the equipment and material requirements for the task, including: analysing the different wood species as materials and the possible techniques of elaboration.

4. Planning the project product, doing calculations, measurements, applying technical drawing, scheduling.

5. Manufacturing the product as planned.

6. Evaluating the project product and their job.

7. Refining the project product and summarising what they've experienced through the project.

Source: Digital Well-being Programme, Digital Theme Week, Sample projects (accessed 22 April 2022)

Forum discussion

Please join the forum and share your views in the question below:

Developing students' transversal skills VET schools are expected to develop students' transversal skills (communication, cooperation, creativity, critical thinking). How can teachers reflect this need in their own teaching practice? How can digital tools help? Share your experience with us!

5.6   DIGITAL TOOLS FOR PEDAGOGY

5.6.1   DIGITAL TOOLS IN THE LESSON STUDY RESEARCH

Vocational schools and their teachers are under enormous pressure to meet today's labour market expectations. System-level changes are usually taking a long time, so the bottom-up initiatives within the schools are of key significance. Lesson Study offers an opportunity for schools to use internal resources to take a small but effective step towards improving learning outcomes.

LS4VET Model (Khaled A. et al., 2021)

Digital tools can be useful in the LS cycle in two ways: they can help collaboration in all seven steps (sharing documents, collaborating on a project in Google Drive, for example), but they can also be linked to the research objectives of the lesson.

The following chapters will focus on the pedagogical use of digital tools. There are still many open issues and problems to be solved in the use of technology in education, as we have seen in the pandemic. Therefore, the question "Did the digital tool used in the classroom help or hinder the achievement of learning objectives?" may be of interest as an observation aspect of the research lesson.

5.6.2   LEARNING DESIGN FOR THE DIGITAL AGE

One of the prominent initiators of the move away from frontal teaching towards active learning methods is the American researcher Benjamin Bloom, who argues that the effectiveness of learning is determined by three fundamental factors: the prior knowledge of the learners, their motivation and the quality of the teaching. Bloom's taxonomy (1956), named after him, and its various revisions, are still relevant today.

According to Bloom, active learning occurs when learners are given a task that can arouse and sustain their motivation to learn at the level of thought, emotion and will. The taxonomy categorises levels of learning outcomes on the basis that teaching moves learners from lower levels of thinking (knowledge, understanding, application) to progressively higher levels (analysis, synthesis, evaluation). Bloom's theory describes learning operations in three domains.

- **Cognitive Domain** (thinking skills, like understanding, analysing and evaluating)

- **Affective Domain** (attitudes, perception, appreciation, acceptance)

- **Psychomotor Domain** (physical skills, performance of actions such as construction, assembly and disassembly)

At the beginning of the 21st century (2001), American psychologist David Reading Krathwohl proposed a modified version of the taxonomy. The nouns were replaced by verbs indicating learner activity (memorise, understand, apply), the synthesis was moved down one level, and the highest level was taken by 'create', which refers to independent creative work.
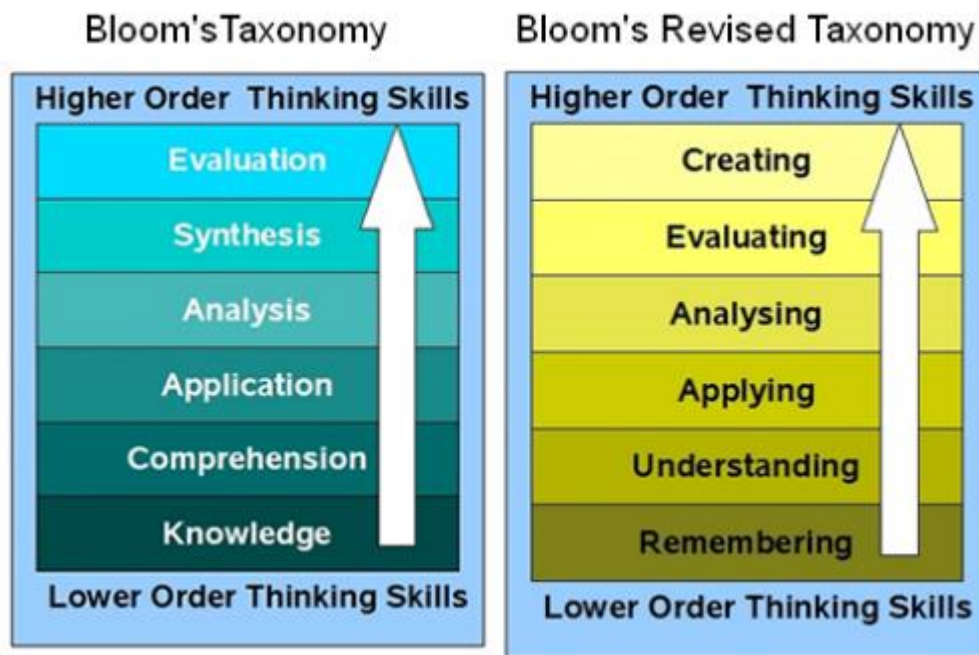
(Source: Churches, 2008)

In 2007 Andrew Churches[9] adapted it to the digital age, and new version has become an indispensable tool for designing learning and teaching in the 21st century. Bloom's Digital Taxonomy helps teachers to select and use digital tools not for their own sake, but consciously, in line with the pedagogical objectives and the learning goals of the lesson.
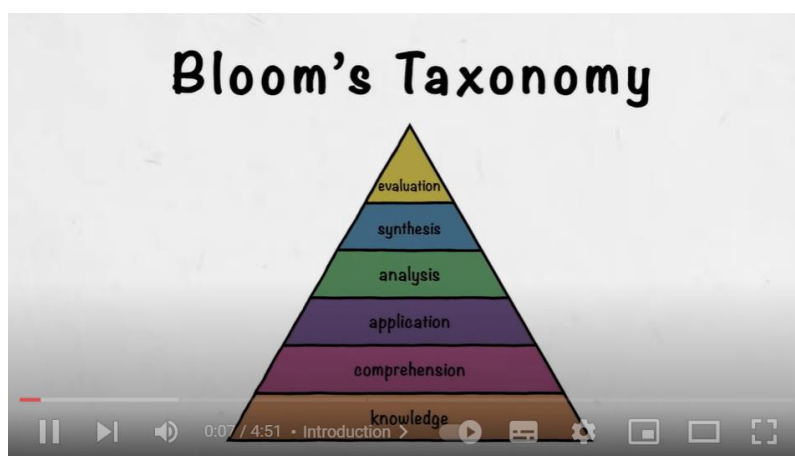
Bloom's Digital Taxonomy, a video by Common Sense Education[10]

The video shows the history of taxonomy and the essence of its digital version in a very illustrative way. Let's look at some examples of how a specific digital tool can be linked to a learning objective.

In an agricultural vocational school, students are learning about ploughing and the lesson starts from the lowest level of "memorise" in Bloom's scale.

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[9]Andrew Churcher ICT teacher, he is the Vice President of the Global Digital Citizen Foundation, https://globaldigitalcitizen.org/

[10]Nonprofit szervezet, amely ingyenes digitális tananyagokat tesz közzé pedagógusok számára age. https://www.commonsense.org/education/

> Sample verbs suggested to use in writing learning outcomes at that level:
>
> Recognising, listing, describing, identifying, retrieving, naming, locating, finding. (Churches, 2008)

Learning goals

At the end of the lesson, the learner will be able to

- list the main characteristics of ploughing,

- list the means of ploughing,

- …

Suggested digital tool: an online mind-map plotter (e.g. bubble.us)
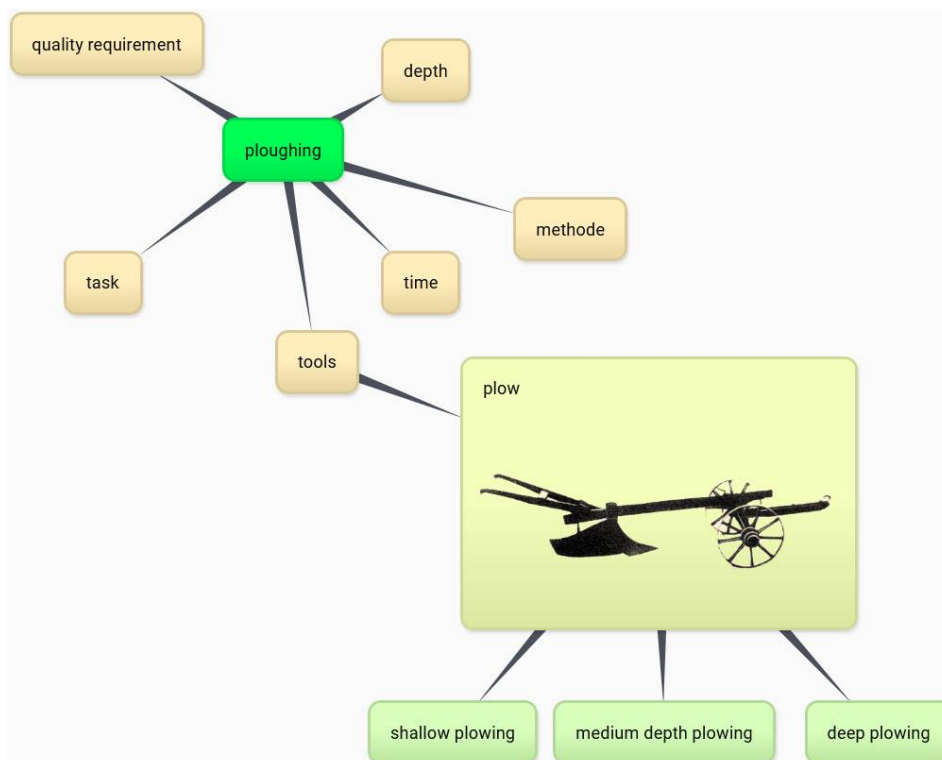
Source: Digital Menucard (https://dmc.prompt.hu/hu/forrasok/eszkozok/bubblus)

Discover more!

https://www.schrockguide.net/bloomin-apps.html

5.6.3   USING DIGITAL TOOLS IN TEACHING — WHAT ARE THE DIFFICULTIES

The number of digital devices is growing exponentially every day, to the point where it is almost impossible to keep track. The abundance of choice makes both choice and application difficult. Registration is mostly compulsory, the interface is different everywhere, often with menus and learning materials in English only. Different applications have to be used for creating mind maps, storytelling, presentations, reports, sharing content online, etc., user names and passwords have to be remembered.

It's not easy to change overnight but increasing the intensity of knowledge sharing among the teaching staff, launching collaborative developments such as the Lesson Study research, offer real opportunity to overcome challenges with the power of the community.

The internet offers a new learning environment, free of time and space constraints, which does not close in the evenings, summers and holidays like schools and libraries. Virtual environments—such as Moodle, Facebook, SecondLife, Twitter, blogs and wikis are a new agora of learning communities, which the teachers must join if they don't want to be left behind. Navigating the virtual environment, using digital tools and online applications confidently requires a lot of effort and time, which might be too much of a burden beside the daily schoolwork.

A few decades ago, teachers all taught from standard textbooks, there was no expectation to write coursework alongside teaching, apart from shorter assignments, tests and homework for students. The digital age has brought a fundamental change in this area. Today, it is almost mandatory to produce digital learning materials that motivate and inspire students, and to provide additional content that was missing from the textbooks published years ago. Writing and editing the digital learning materials in a creative, interactive digital format with pictures, quizzes and other interactive components is time-consuming, even for a single lesson.

What strategy can help teachers overcome these difficulties? What are the criteria for selecting the digital tools best suited to their pedagogical objectives? Let's look at some possible answers to these questions in the following paragraphs.

Collaborate!

For centuries, teaching was a solitary occupation: the teacher sat at his desk, correcting papers, preparing for his lessons. In the past, collaboration and sharing of teaching materials between teachers was not common practice, but today it is essential.

Together, it's easier to discover new tools! Active and collaborative learning should become part of everyday work, not only in the classroom but also in the classroom. It is much easier to innovate and use a new digital tool effectively if, for example, the IT teacher, the subject teacher and the English teacher work together.

Involve your students!

Never in history have young people had to teach their parents or teachers, but in the digital age this should become natural. Students can edit and make videos or creative presentations more quickly; we save time by accepting their help and involving them can even increase their confidence and responsibility for their own learning outcomes.

Search for and use Open Educational Resources!

We create digital learning content for motivating and inspiring our students. To achieve that, a presentation with pure text won't be enough. The internet is full of attractive digital assets (photos, pictures, videos, animations, etc.).

However, care must always be taken to comply with the rules of fair use, especially when modifying source material. The next chapter of this module aims to help you with this.

Share your own digital content as open!

Global communities committed to publishing educational resources for free invite us to share our own digital textbooks, courses, videos, lesson plans and even smaller works like quizzes for students. If joining global communities seems too big a task, we can start "small", within our own school.

The best way to do this would be to start a project within the school to create a common repository of digital materials and invite all the teachers to join and build this repository together. While such a solution does not

require any additional IT infrastructure, it can save time for all members of the teaching staff and can initiate a common, cross-curricular collaboration in the development of digital learning content.

5.6.4   DESIGNING E-LEARNING COURSE

Course design for using it in a virtual learning environment is a complex process depending on the target student audience, chosen pedagogy and instructional design. The diagram below illustrates the spectrum of delivering a course in face-to-face form, or fully online, without any F2F activities.

(Currie, K., 2010, in Tenegen handbook)
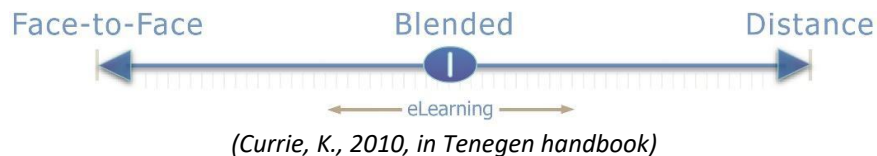
If you are creating a digital curriculum for a classroom lesson (left edge of the diagram), you don't need to work out all the details in the curriculum, as there is the possibility to explain the missing parts.

As we move away from planning classroom lessons towards designing courses for self-paced, online learning (left to right on the line), e-learning materials need to be developed in much more detail, as we will not be there with the student as they work through the material.

The blended learning design seeks to exploit the advantages of both forms of learning (classroom and distance learning) at the same time. Many trainers consider this to be the best form of training today. The e-learning course material should also be designed to support independent learning and knowledge checking, but the more difficult to understand parts can be explained in the classroom.

Distance learning, which is marked on the far right of the line, requires the most detailed and accurate design, as the learning process runs without direct teacher support. Online training is usually delivered in a complex learning environment, in an e-learning framework. One such framework is Moodle, which learners can use with unlimited time and space. In this case, the courseware must support the entire learning process, with almost no teacher intervention — i.e. the teacher must build all the necessary functionality into the e-learning framework in advance (Currie, K., 2010). While it is true that the latest versions of e-learning frameworks offer more and more possibilities for online (teacher-student, student-student) collaboration and communication, they cannot fully replace the teacher's personal presence, even if online conference calls can be held.

Course components in VLEs

As mentioned above the latest versions of the VLEs offer more and more options for including interactivity, supporting collaboration and communication among the students and among the teachers and students as well. Beyond the basic course components, like digital learning materials for reading and assignments, the e-learning developers can integrate several external apps and web 2.0 tools for emerging more active learning of the students.
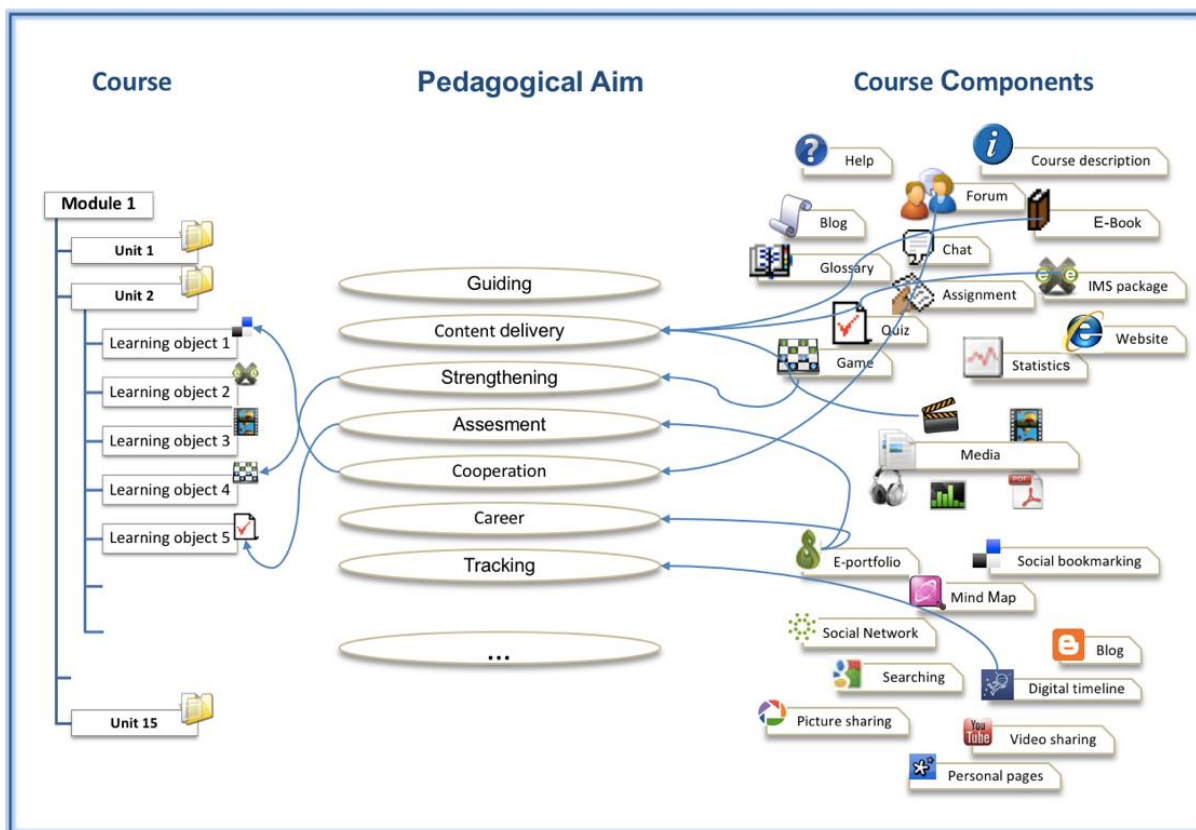
Source: Tenegen, 2010.

The aim of careful e-learning design is to ensure that there is not a single digital component in the system that is not linked to at least one of the learning and pedagogical objectives of the training.

5.6.5   HOW TO CHOOSE?

In this section, we bring together some considerations that can help you make the right decision: what to take into account before spending more time getting to know the features and working environment of an online tool that seems useful in the classroom.

Multilingual interface

A serious barrier to progress is if the user interface of the tool is only available in one language (usually English). The number of multilingual platforms is gradually increasing. Before deciding, it is worth checking whether there is a solution for the task you are looking for in your own language.
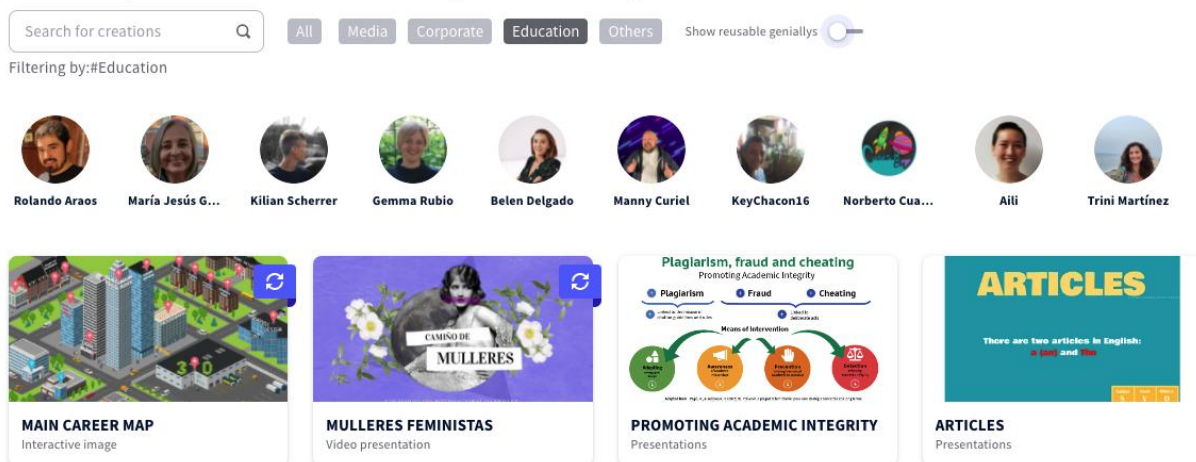
A widely used example is Learning.Apps (https://learningapps.org/)

Rich selection of creative templates

A wealth of research shows how important visuality is for today's students. Visual, interactive online games, YouTube videos and infographics have become part of their everyday lives. PPTs with long texts are boring and unmotivating for them. At the same time, teachers cannot be expected to produce attractive graphics in addition to focusing on the technical content of the curriculum, as graphic design is a profession in its own right.

Searching for free images, photos and diagrams can help, but there are better ways. The latest online editors offer a wealth of eye-catching templates, richly decorated with graphic elements, for free. One such tool is Genially, for creating interactive presentations. It offers an unlimited number of eye-catching templates, with the drawback that its user interface is not in Hungarian (English, Portuguese, Spanish, French and German are available), but hopefully the list of languages will be constantly extended, the presentations can be in Hungarian and the editing interface is easy to use.

Genially (https://app.genial.ly/)

We tested Genially by creating an interactive presentation on Flipped Classroom, you can check it as an embedded Youtube video, an H5P interactive video and a simple quiz from LearningApps.

https://view.genial.ly/6214dbf25d2ab600124b63da/presentation-vibrant-flipped-classroom-presentation

Multiple ways to share content

An important feature of educational applications is the ability to share online content with students and, if necessary, download it in different formats. If you want to use your online presentation without an internet connection, you can download it in PPTX, PDF format. Finally, it is also very important that digital content can be embedded in different websites, e-learning frameworks, blogs and especially in the online learning environment where we usually work with learners.

Remark: if you aren't familiar with how to embed a digital content like a Youtube video, please, read the short guide in the Annexes.

Look for an "all-in-one" app!

The latest trend in the development of web 2.0 tools is to integrate multiple functions into a single application. Developers have realised how inconvenient it is to have to use multiple applications for a single workflow, registering and remembering passwords for each one separately. More and more applications are tackling this problem by offering so-called "Social Auth Login" registration in the most popular social applications, such as Google or Facebook accounts. When choosing an app for regular daily work with students, it is worth looking for one that supports the learning process in a variety of ways, offering a range of features

Check the business model

There's nothing more annoying than when you've got to know an app quite well, but while you're working you get a message: you can only use this feature if you subscribe! The next step is to pay or decline, and when the app only offers a one-year subscription, we usually opt out, even if they give us the option to unsubscribe.

However, there is another, more convenient business model, which has recently been offered by some educational apps. On these platforms, most features can be used without a subscription and many templates, images and videos are available for free. You only have to pay for the special stuff, such as a more complex video, artistic photo, diagram or music, and these usually cost only a few dollars. In the next section, we will briefly introduce the Canva online application, which offers a "many things in one" business model.

5.6.6   A TEASER FOR CANVA

Canva is an online tool for producing creative digital content with rich multimedia components such as images, videos, graphic elements, music, etc. It helps teachers to overcome the most difficult tasks while they want to prepare a motivating learning content for their students with attractive graphic design. Canva offers hundreds of templates for different types of contents for education, for marketing, or for personal purposes like writing a CV. Only a registration is needed to use most of its functionalities, the vast majority of templates and media elements.

It has a multilingual, user-friendly interface, and operates on different devices, tablet, mobile and laptop, and supports working in teams.
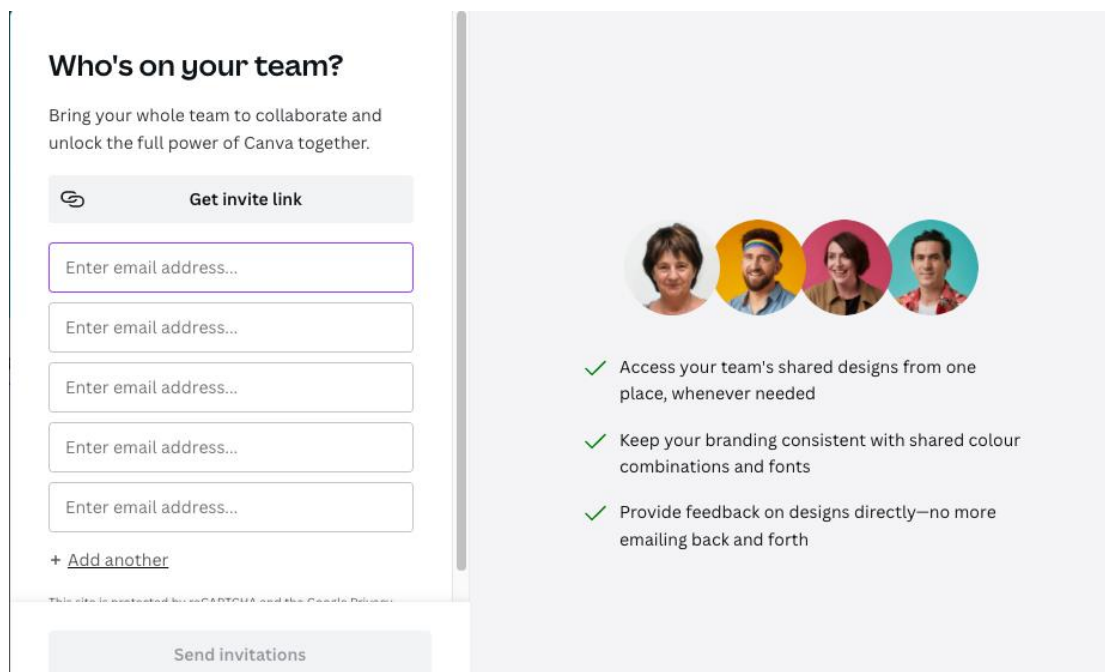
Even beginners can create sophisticated, printable graphics and documents (presentations, flyers, certificates, CVs, etc.) by using one of the wide range of well-categorised templates.
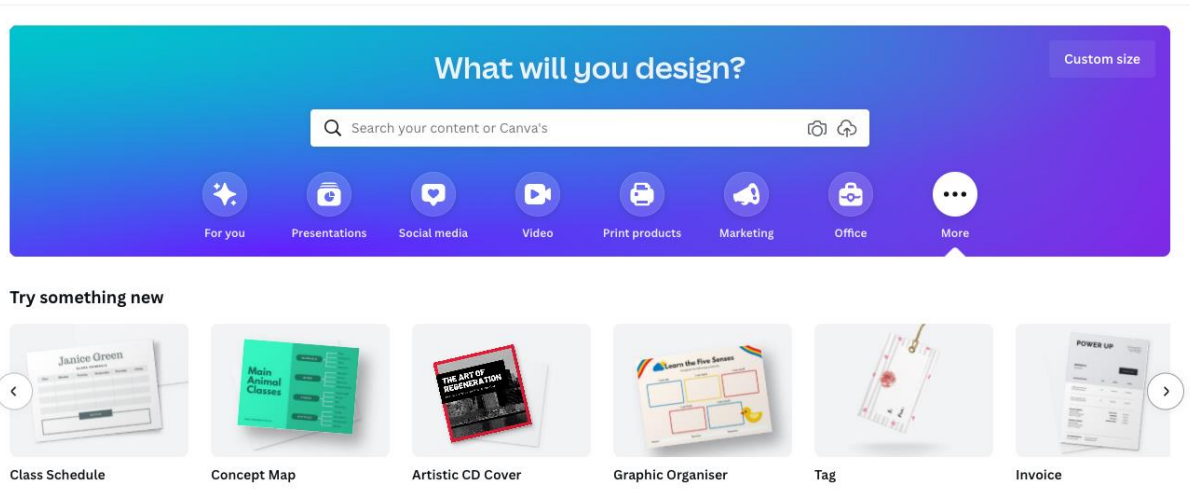
The first creative work can be ready in a few steps, but it will not be saved without registration!

1. Search and select a template for concept map.
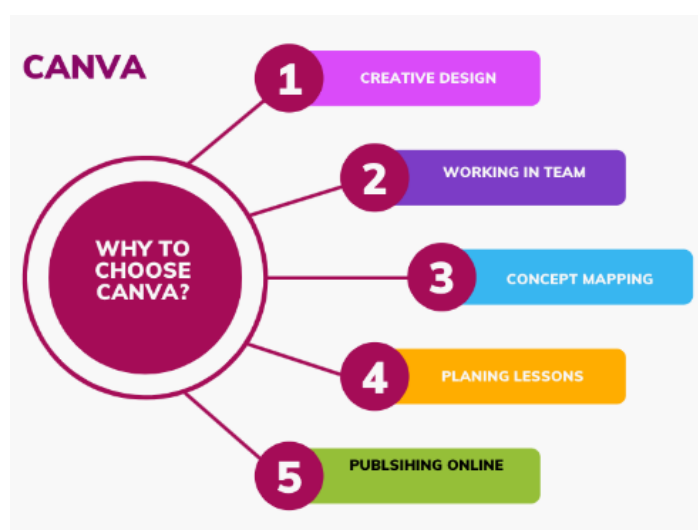
2. Change the text in the picture.

The next steps, saving the work, sharing it with others are also not allowed without registration.

Now let's look at an example of how to share, download the completed creative work with others. In the picture below you see that we selected a template for planning a project, and after adapting the texts and pictures to our purposes, we started to publish the work by clicking on the "Share" button in the upright corner. From the drop-down menu you get plenty of options to choose from, from embedding into a website, publishing in social media, or downloading as a PPT presentation, according to what you need just now.
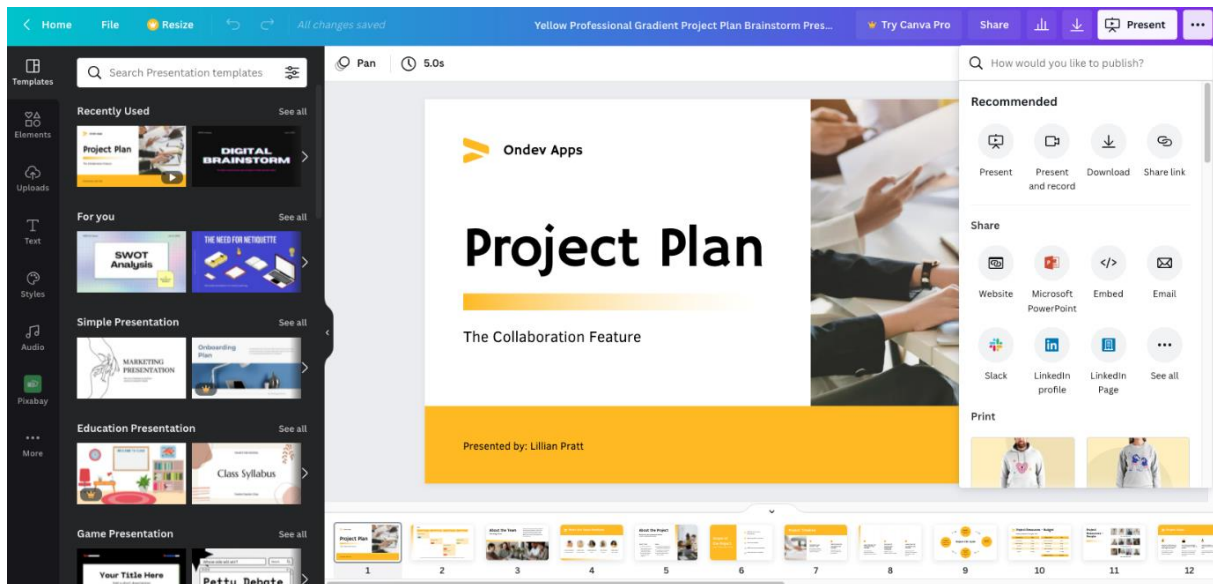
We created 2 examples of the kind of creative products that might be appealing for teachers and can be used for collaboration in a Lesson Study cycle. The first one is a pretty simple presentation to be shared within the team in the phase of identifying the problems in class and how to explore them.
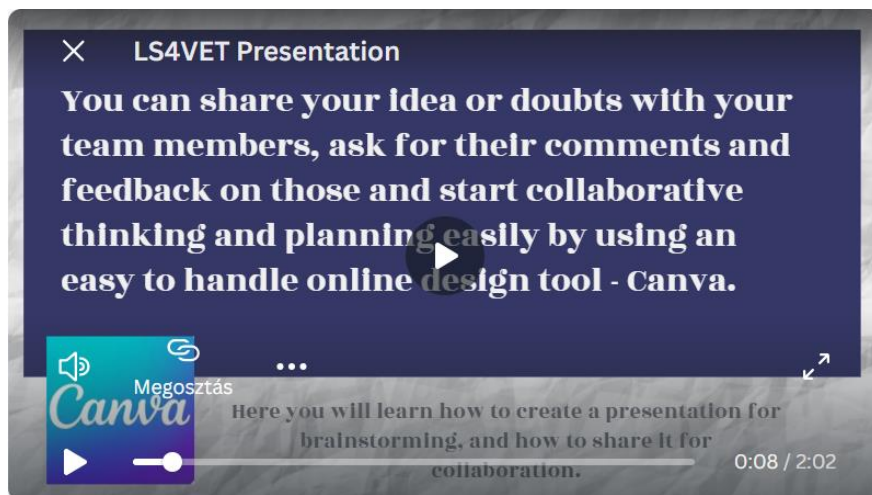
LS4VET Presentation by Kacsur Annamária,
https://www.canva.com/design/DAE5vnRbejE/watch?embed

The second one is a video detailing how the presentation was made step by step and what functions of Canva we used when creating it. The video also shows the ways of further utilisation of the product, like downloading in different formats, or sharing it as an embedded content or via social media.

Presentation in Canva by Kacsur Annamária,
https://www.canva.com/design/DAE51cIMQao/watch?embed, Discover Canva with your students!

5.7   OPEN EDUCATIONAL RESOURCES

It has become clear already at the end of the nineties, that teachers alone cannot be expected to produce large quantities of high-quality digital learning materials, and a breakthrough can only be achieved through broad - global - collaboration. A small group of higher education professors started to work on developing digital learning contents for the developing countries on behalf of UNESCO, and they agreed that all the materials will be freely available "for the whole humanity", allowing not only for use but also to rewrite, edit and adapt as needed. This agreement was published in the form of a declaration in 2002, thus launching the "open education" movement that is still alive today and has since been associated with the birth of the term "Open Educational Resources - OERs" around the world.

Read more: https://www.capetowndeclaration.org/

Open Educational Resources (OERs) are any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use, adapt and reshare them. OERs range from textbooks to curricula, syllabi, lecture notes, assignments, tests, projects, audio, video and animation. (UNESCO 2012)

Along with the declaration a world-wide movement and collaboration started[11] for developing freely available digital learning materials. Teachers, scientists, and artists were invited to share their creative intellectual works (textbooks, courses, videos, multimedia learning contents) on the internet, not only for use (reading, listening, watching), but also editing and adapting.

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[11]In the "Forum on the Impact of Open Courseware for Higher Education in Developing Countries" organized by UNESCO in 2002, the participants agreed to collaboratively develop a universal educational resource available **for the whole of humanity,** to be referred to henceforth as Open Educational Resources.

The first globally successful "community content development" project was Wikipedia, initiated by the non-profit foundation Wikimedia, established in 2003.

In the next section we can give only some examples of the global libraries, repositories operated by non-profit organisations, where millions of freely available digital contents are offered for educators all over the world.

5.7.1   5.1 EXAMPLES

MIT OpenCourseware

Massachusetts Institute of Technology (MIT) was the first well-known educational organization to release its own didactical materials with the license of "copyleft"[12]. On the OpenCourseWare (OCW) website of MIT all the materials and courses available are free of charge.

OCW celebrated its 20th birthday in 2021!

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[12]The term copyleft is an English pun, used as the opposite of copyright.

European Commission published in 2013 its strategy for promoting innovation, open educational practices and open educational resources, entitled "Opening up Education"[13]. The initiative focuses on the following three areas:

- Creating opportunities for innovation for education organisations, educators and learners.

- To promote the wider use of open educational resources (OERs), ensuring that publicly funded educational materials are accessible to all.

- To improve ICT infrastructure and internet access in schools.

Wikimedia Commons

Wikimedia Commons is a media file repository making available public domain and freely licensed educational media content (images, sound and video clips) to everyone, in their own language. It acts as a common repository for the various projects of the Wikimedia Foundation[14], but you do not need to belong to one of those projects to use media hosted here. The repository is created and maintained not by paid archivists, but by volunteers.

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[13]The document is available in each European language.

[14]Wikimedia Foundation, Inc. is a 501 non-profit organization headquartered in San Francisco, California, registered as a foundation under US law. It owns and operates the Wikimedia projects. It was established in 2003 by Jimmy Wales as a way to fund Wikipedia and its sibling projects through non-profit means.
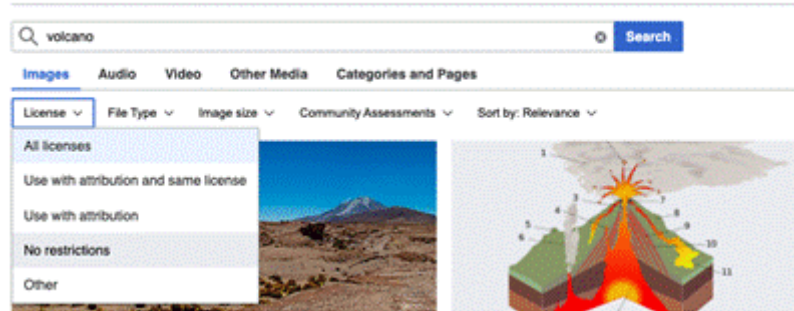
OERs for technical and vocational education (TVET)

OERs in TVET - UNESCO

The UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training is one of 8 UNESCO institutes working in the field of education. UNEVOC published a collection OERs (services and platforms) for technical vocational education and invite everybody to join and extend this list.
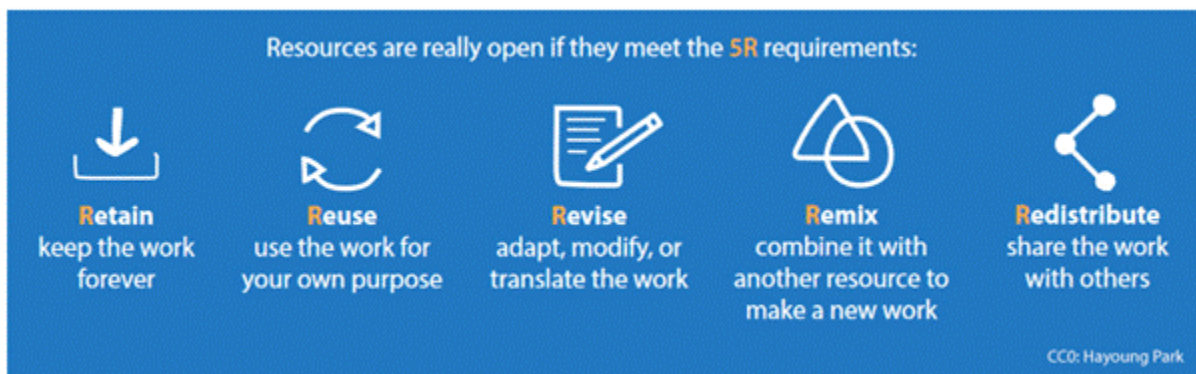
Creative Commons

We can insert links into a learning material to different digital objects (to a video, a presentation, quiz, simulation or even a single image) only with respect to the rules of the intellectual property rights. The first step is to clarify that providing a link to the resource does not infringe copyright.

Suppose you want to download a source material to include it in your own help for teaching, and possibly even to modify it. For example:

- *You want to insert a picture in a document or presentation.*

- *You embed a video on your website or insert into your presentation.*

- *We would make our own films using details of someone else's video.*

- *We would like to copy some questions from a test found on the Internet into our self-made test.*

In these cases, we must always pay attention to the licences under which the resources we want to use have been published, and of course we must respect them.

If you want to include a few sentences from Wikipedia in your own text, you can, but you must respect the terms of the licence. It is the "Attribution-ShareAlike 4.0 International" licence. This means that you can modify the text, and even use it for commercial purposes, but you must indicate that it is from Wikipedia and that the source must be published under the same licence (or a similar but no more restrictive licence).

https://creativecommons.org/

Two legal concepts whose content may vary from country to country, but in any case, serve to protect the products of intellectual activity (text, music, images, video, software, etc.) taking into account the moral and heritage rights of the original author of the work.

The symbol in the first line is well-known by all of us. The symbol in the second line refers to works that can be used freely either based on the intention of the original author or after the death of the author after a certain period of time, in many countries 70 years.

Copyright	Intellectual property rights	Ⓒ
Copyleft	Public domain	Ⓒ

The second Creative Commons (CC) is a non-profit organization (founded in 2001) which offers open licenses that respects the intellectual property rights of the owner of a creative work and provides permissions granting the public audience the rights to access, re-use, re-purpose, adapt and redistribute educational materials. The authors, creators when publishing digital contents can visit the website of the foundation, and they can generate the logos of the license they select by following some simple steps. The licenses are placed in the spectrum of full cop and the public domain **"no rights reserved".**
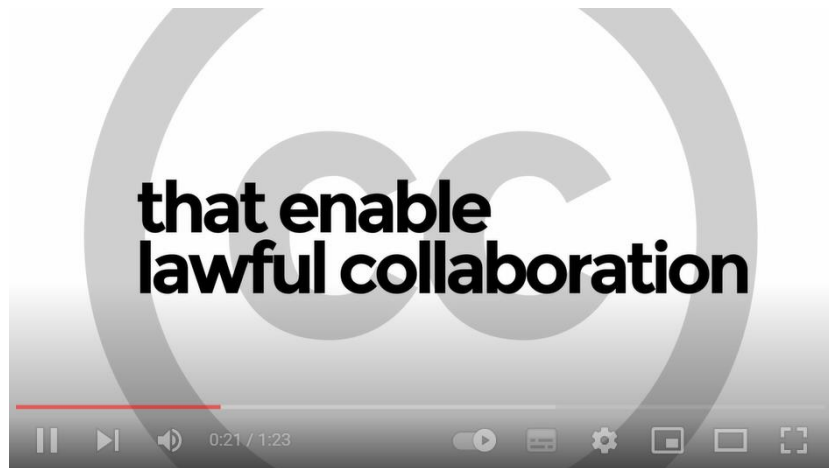
5.7.1.1.1 Types of free CC licences

The Creative Commons licenses can be used in digital format, we can download them as a picture and insert it into the different types of creative work published as a PDF or Word document or a PPT presentation. The other option is to download the embedding code (in the same that used by Youtube), and to insert it into any kind of websites, online content.

The license allows "re-users" to distribute, remix, adapt, and build upon the material in any medium or format with limitations defined by the owner of the work by the license. Each license is built up from one or more standard figures which are the visual representations of the rules expressing limitations asked by the owner.

  CC	**Creative Commons License**
  BY	**Attribution** You must give appropriate credit, provide a link to the license, and indicate if changes were made.
  SA	**ShareAlike** If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original.
  NC	**Noncommercial** You aren't allowed to use the material for commercial purposes.
  ND	**No derivatives** No derivatives or adaptations are permitted. If you remix, transform, or build upon the material, you may not distribute the modified material.

CC0	**No rights reserved** The person who associated a work with this deed has dedicated the work to the public domain by waiving all his or her rights to the work worldwide under copyright law, including all related and neighbouring rights, to the extent allowed by law.
Examples	
CC BY-SA	**Attribution**-ShareAlike 4.0 International You are free to: **Share** — copy and redistribute the material in any medium or format **Adapt** — remix, transform, and build upon the material for any purpose, even commercially.
CC BY-NC-SA	**Attribution**-NonCommercial 4.0 International You are free to: **Share** — copy and redistribute the material in any medium or format **Adapt** — remix, transform, and build upon the material
	CC0 1.0 Universal (CC0 1.0) **Public Domain Dedication**

5.7.1.1.2 Publishing your content by using a CC licence

Visit the CreativeCommons website!

Don't worry about the languages, the Creative Commons licenses are available in 31 languages, you will find yours!

- Start to create your own digital license for your creative work by clicking "Share your work" and follow the instructions with "Get started".

- Before starting, scroll down and select your language for your license:

- Answer the questions by selecting the option relevant for you! You will get the license in the right window.
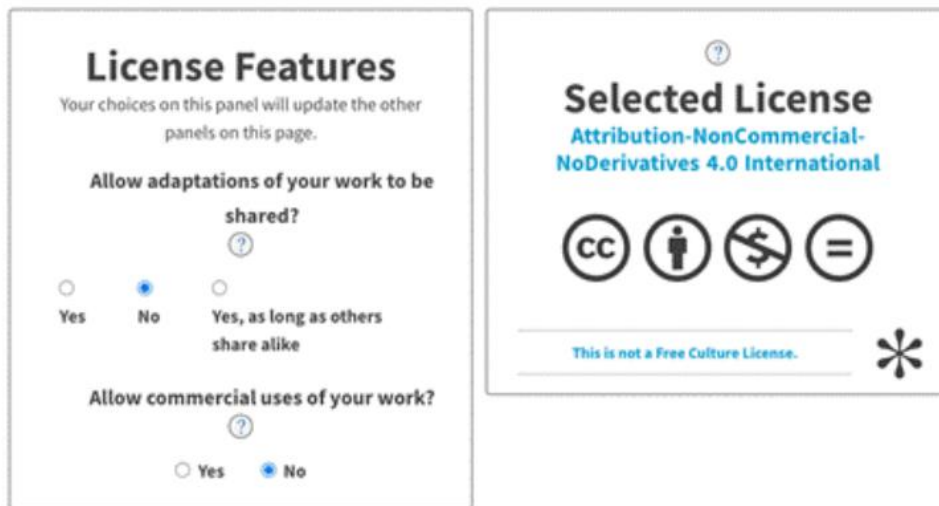
- In the last step, you can download the figure of the license you selected, or you can copy and insert the embedding code if your work is published online (as a HTML page).
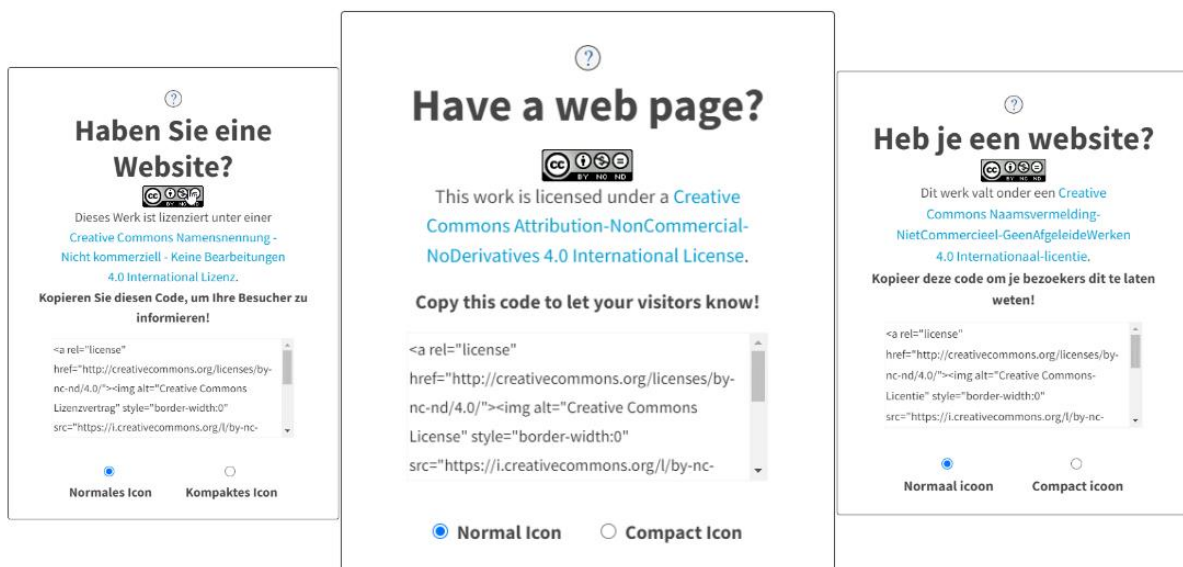
Now, I created a free culture license for the learning content you are reading just now, and I insert the embedding code here, as Moodle works with HTML code as well:


This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

5.7.1.1.3   Filtering digital objects by CC licence

While searching for digital content on the internet, we usually start with one of the search engines, like Google. How can we decide whether the picture, etc. is free for reuse or not? When you open the viewfinder, after selecting the "Tools / Rights of Use" menu item, the drop-down list (reusable, modifiable and/or used for commercial purposes) offers the option to filter. Filtering can be turned off, but you'll need to consider a potential copyright infringement conflict.

Let see a simple example: I search for a picture of vocational students:
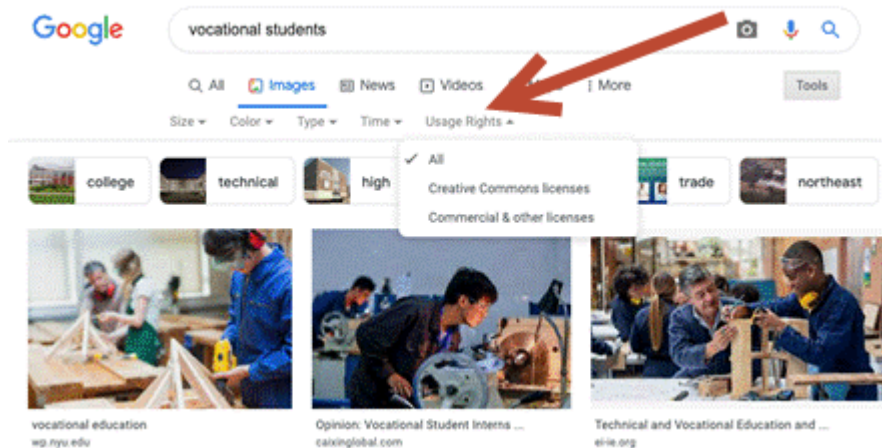
Google offers a huge number of pictures, but I have no information about the copyright issues. By clicking Tools, I get an extra menu below, in which I can go on by clicking **User Rights.**
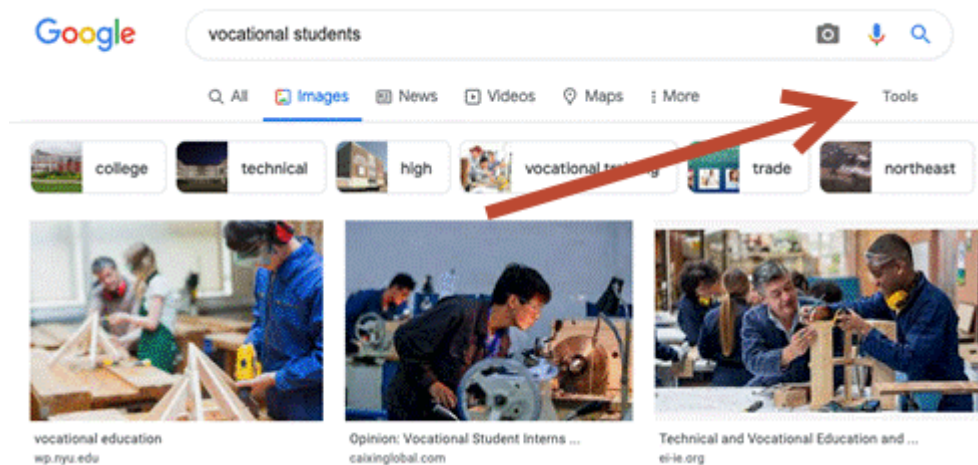
From the list I can choose "Creative Commons licenses" in order to filter the pictures published by one of the free licenses.
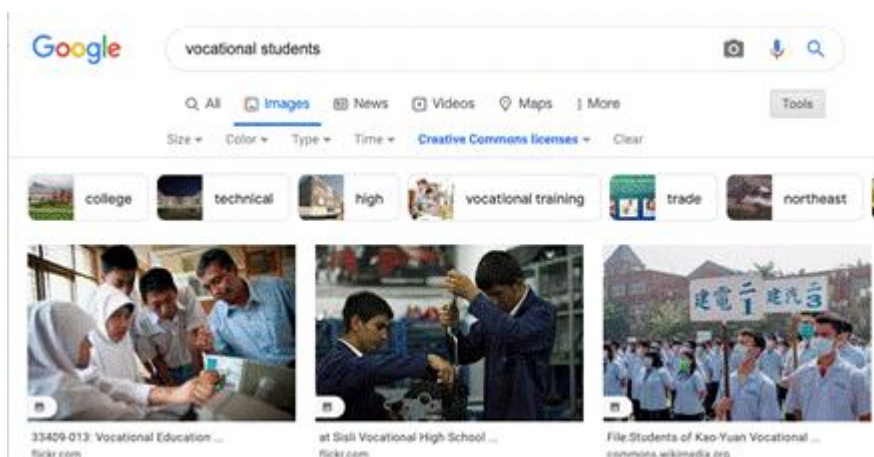
Now, selecting one of the pictures published by free license, we can go to the original source, and see details on the type of the license. Below the picture you see the symbols that tell you: you can use it for non-commercial purposes, adaptation, modification is not allowed, and you have to give correct reference to the owner of the picture.
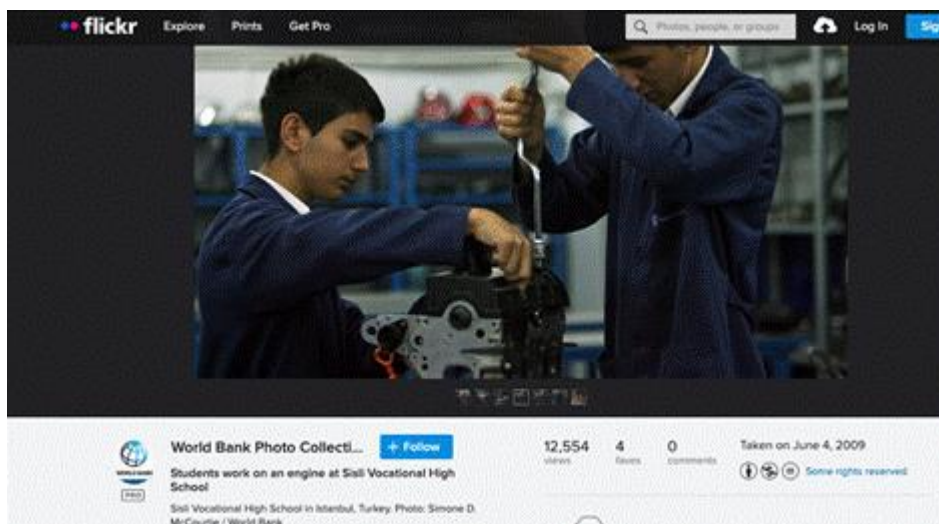
Wikimedia

Wikimedia is a foundation aimed at delivering open educational resources, "free educational contents to the world". They are running several projects, among them Wikimedia Commons is a media file repository making available public domain and freely-licensed educational media content (images, sound and video clips) to everyone. The pictures, videos and other types of media are published by using one of the Creative Common licence.

Forum discussion on OERs

The famous Open Educational repositories offer hundreds of digital learning materials, however the vast majority of these content is English. Building national galleries for freely available learning contents has been started in each European country during the last ten years.

Do you use national OER repositories that you can recommend to other teachers?

Have you ever shared your own digital learning material in online repositories (international, European, national) or on web 2.0 platforms that are accessible not only to your own students but also to a wider audience? Do you use free cultural licences (e.g. Creative Commons)?

5.8 ANNEXES

5.8.1 BLOOM'S TAXONOMY

"Within the cognitive domain, Bloom's Taxonomy defines six levels, from the simplest behavior to the most complex. When describing behaviors, take a look at the list of measurable words in the charts below:"

Level 1: Information or knowledge Show that you know:				
Cite Count Define Describe Draw	Identify Indicate Label List Locate	Name Point Quote Read Recite	Recognize Record Relate Repeat Select	State Tabulate Tell Trace Write

Level 2: Comprehension Show that you understand:				
Associate Classify Compare Compute Contrast	Convert Describe Differentiate Discuss Distinguish	Estimate Expand Explain Express Extrapolate	Illustrate Interpolate Interpret Locate Predict	Report Restate Review Summarize Translate

Level 3: Application Show that you can use what you have learned:				
Apply Calculate Choose Procedures Collect Information Complete Construct	Demonstrate Dramatize Employ Examine Find Solutions Illustrate	Interpolate Interpret Locate Operate Order Perform	Practice Predict Relate Report Restate Review	Schedule Sketch Solve Translate Use Utilize

Level 4: Analysis Show that you perceive and can pick out the most important points the material / presentation:				
Analyze Appraise Conclude Contract	Criticize Debate Detect Determine	Diagram Differentiate Distinguish Experiment	Generalize Infer Inspect Inventory	Organize Question Separate Summarize

Level 5: Synthesis Show that you can combine concepts to create an original thought or idea:				
Arrange Assemble Collect Compile Compose	Construct Create Design Detect Develop	Formulate Generalize Integrate Invent	Manage Organize Plan Prepare	Prescribe Produce Propose Specify

Level		6:		Evaluation
Show that you can judge and evaluate ideas, information, procedures and solutions:				
Appraise Assess Choose Compare Conclude	Contrast Criteria Critique Decide Determine	Develop Estimate Evaluate Grade Judge	Measure Rank Rate Recommend	Revise Score Select Test

Words		to		avoid
Avoid using these words and phrases when writing objectives:				
Appreciate Be comfortable with Believe Enjoy	Grasp the significance of Have faith in Internalize Know	Learn Recognize Understand	

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