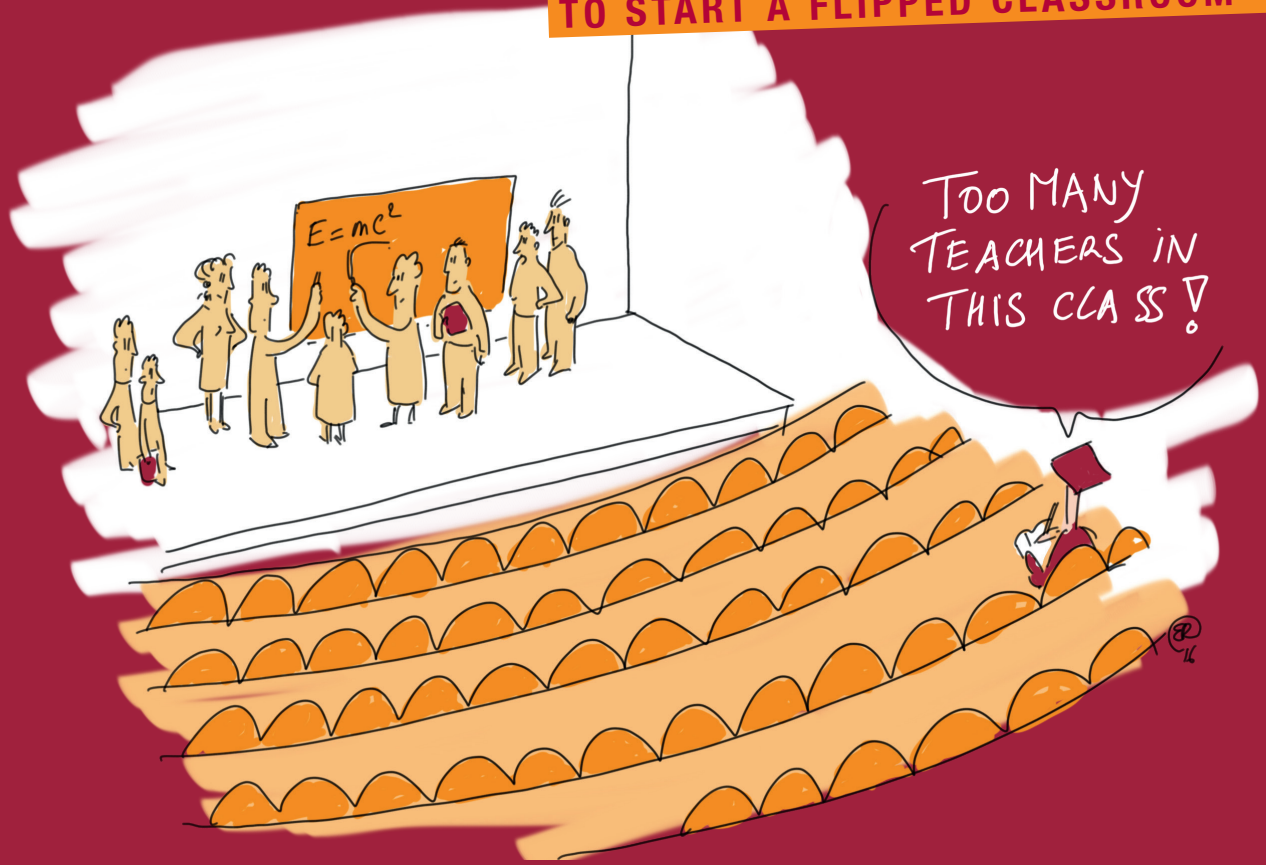
LES CAHIERS DU LOUVAIN LEARNING LAB

N° 1 *bis* – 2020

The flipped Classroom is the right way forward

A PRACTICAL GUIDE TO START A FLIPPED CLASSROOM



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N°1BIS **The flipped Classroom is the right way forward**

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Illustrations: Benoît Raucent
Translator : Moira Bluer
Graphics and layout: Catherine Le Clercq

INTRODUCTION

In 2016 LLL launched the second cycle of "flipped classroom" training. It proved to be extremely popular, but many teachers at UCLouvain and the Pôle Louvain higher education consortium were unable to take part at the time. The establishment of the Pôle Louvain Teacher Training Centre provided the necessary resources for the launch of two new training sessions in the 2016/2017 academic year. This enabled 40 Pôle teachers to (re)visit their practices with the aim of flipping their classroom and finding a teaching method they could apply directly to their lessons.

The core concept of the proposed method is to work on the same project with a cohort of teachers to discover facets of the flipped classroom throughout the whole education process. During this cycle the teachers will have the opportunity to experience and try out the flipped classroom method before they put it into practice. The concept involves students doing activities before class (watching a video clip, reading an article, preparing documentation for a specific case study, etc.) to encourage more interaction during the lesson.

This short guide has been written specifically to support the new editions of the flipped classroom training sessions. As such, it does not claim to be a treatise on the subject but will permit further reflection on the topic developed during this cycle.

We would ask every one of you to make full use of this resource and to continue to observe and learn to help you improve the quality of the project undertaken.

Dr **Pascale Wouters,** Head of the Pôle Louvain Teacher Training Centre
Prof. **Benoît Raucent,** Head of the LLL

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1

A brief introduction to the flipped classroom…

It used to be the case that 80% of a university teacher's course was taught in the classroom; today, in some disciplines, the pace of knowledge-building has grown so fast that a mere 5% to 10% is acquired in the classroom (Serres & Stiegler, 2012). The teacher is no longer a conveyor of established knowledge, because there is now more knowledge available and it is constantly changing.

The flipped classroom method requires students to independently familiarise themselves with learning material before class. Classroom time is then used to deepen their understanding through various appropriate activities facilitated by the teacher, such as discussion among peers and with the instructor, group projects, lab activities and debate. The individual preparation can involve them using different types of resources (books and other documents, websites, videos, software, etc.) and completing set tasks (research or a quiz, for example). In a flipped classroom, the teacher is no longer the "sage on the stage" but a "guide on the side".

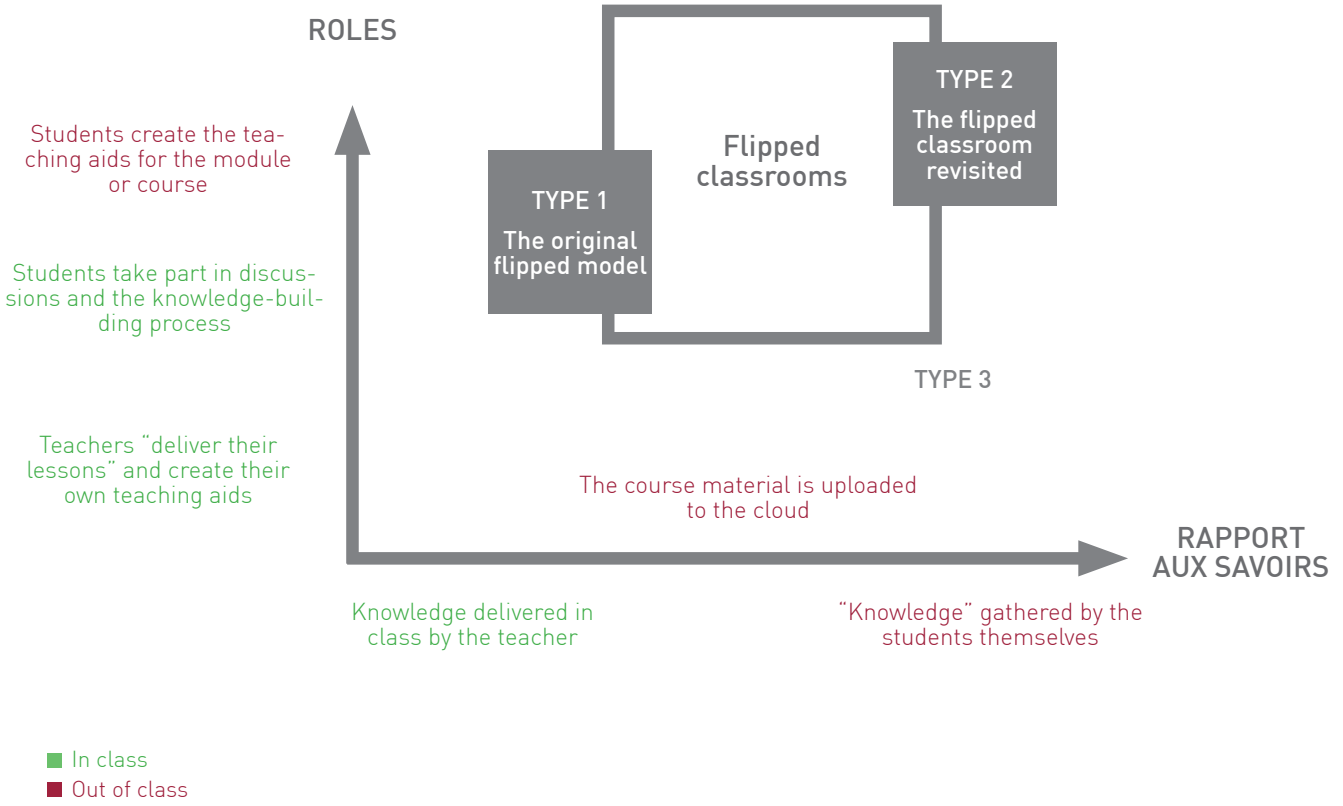
The students, for their part, are no longer considered receptacles for the knowledge conveyed but active partners in the knowledge-building process, thus becoming the protagonist of their own learning. They are expected to learn new skills and to progress from listener/receiver to project manager, taking part in discussions, researching information, presenting case studies and conducting on-the-ground investigations.

The aim may be ambitious but there are many ways it can be achieved. This is undoubtedly one of the reasons why flipped classrooms are so successful: the mindset required is unequivocal but the possible courses of action are infinite. Any teacher can try it out, to a greater or lesser degree, depending on the time and resources at their disposal, how creative they are, their work situation and the type of learners they are teaching.

This practical guide therefore does not outline a specific practice. It is intended to act as a pointer for teachers who, in their own way, wish to learn about and experiment with the somewhat revolutionary flipped classroom approach.

Expanding the concept…
THREE TYPES OF FLIPPED CLASSROOMS

Flipped classrooms don't just involve "watching a video before the lesson and doing exercises and applications in the classroom". They have also transformed the relationship with knowledge and the roles of students and teachers.



TYPE 1 is the "traditional" flipped classroom model: "Lectures at home and homework in class". Here, knowledge is made available off-site ("externalised"), usually online, leaving classroom time for other learning support activities. The focus is on the externalisation of knowledge.

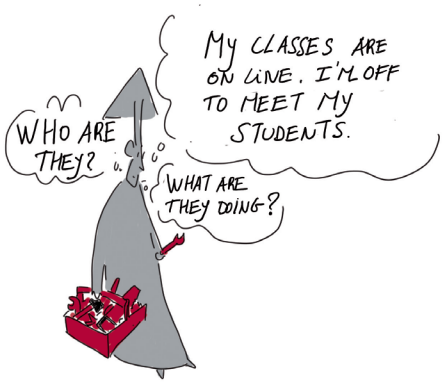
With TYPE 2, students are given contexts and asked to seek out the knowledge themselves. They research information on a given topic, document the subjects assigned, go out into the field, etc. To prepare for their return to the classroom, they create a presentation or use the material to design an activity for their colleagues. The focus is on role reversal (between teacher and student).

TYPE 3 combines Type 1 and Type 2, alternating contextualisation (familiarising themselves with the contexts, looking for meaning, etc.), decontextualisation (modelling, theorising, etc.) and recontextualisation (applications, problems, discussion, etc.) activities. This is what we call flipped classroomS. The plural form emphasises that there are several ways to flip a classroom. These can also be combined: here, by including the activities proposed on both axes in the diagram on the previous page.

The flipped classroom is not...

- **The same as online videos.** The videos are designed to allow more time for interaction in the classroom and support meaningful learning activities
- **Replacing the teacher with videos.** Many flipped classrooms don't use video clips and, when they do, the purpose is to help the teachers impart knowledge to free up interaction time where they can develop their teaching role further.
- **An online course or MOOC (Massive Open Online Course).** Both of these are intended to reduce the time spent in the classroom, but with the flipped classroom the time spent in class is in fact the main focus. The material put online is designed to tie in with and complement the classroom activities. MOOCs can of course be used as a resource.
- **Students left to their own devices in front of a screen.** The activities off-site can be for individuals or groups and don't necessarily involve the use of a screen... They are well structured and based on a precise scenario that is clearly explained to the students.

The flipped classroom **is...**



- **A way to enhance personalised interaction and contact** between teacher and students.
- **An environment that involves a reversal of roles**: the students assume responsibility for their own learning under the guidance of the teacher, who is no longer the «sage on the stage» but the «guide on the side».
- **A fertile mix** of direct knowledge transmission (I teach) and a constructivist or even socio-constructivist approach to learning (the students are expected to learn).
- **A class in which students who cannot attend because of illness or extra-curricular activities do not get left behind.**
- **A class where the content covered (the "material") can be accessed** at any time for the purpose of revision, exams or catching up.
- **A place where students are offered personalised support**

2

From a few pionneers to a vast network

Many teachers had used the flipped classroom method before it became a fully fledged concept, including **Eric Mazur, a physics professor at Harvard**. In the 1980s he documented the technique of peer instruction whereby he suggested that his students learn the theory themselves before class, enabling him to reorganise the classroom element to free up a large amount of time for peer interaction.

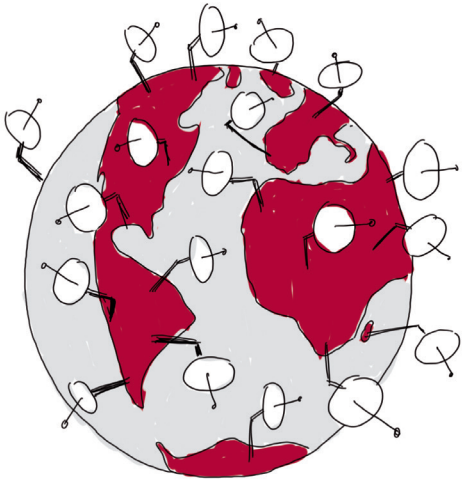
In 2007 the term **Flipped Classrooms** was coined in the United States to describe the experience of **two chemistry teachers, Jonathan Bergmann and Aaron Sams**, who used video clips to enable students who were ill or absent from class to keep up. They then realised that not only were the videos being viewed by all the other students, but that their classroom sessions were livelier as a result. "Lecture at home, homework in class": the flipped classroom was born.

During a talk in 2011, which has been viewed more than a million times, **maths teacher Salman Khan** proposed a series of educational videos. This created quite a stir around the flipped classroom concept, which was widely disseminated and attracted attention worldwide.

A vast network

Networks were very quickly developed: it was rare for teachers using the flipped classroom method to operate alone. They formed formal or informal communities of practitioners sharing a plethora of resources: various media (tested and commented on by teachers), forums for sharing experiences, etc.

These networks were both local (at the same teaching establishment, between colleagues) and international. The Flipped Learning Network, founded by the pioneers of the concept, Sams and Bergmann, is the largest community of online practitioners with 23,000 flipped educators worldwide.



TESTIMONIAL

«For the flipped classroom to work, you must have a passion for teaching. And a passion, by nature, tends to be shared. Exchanging with other teachers opens you up to other experiences and sometimes also offers reassurance…»

3

What you need to know before you begin

GO RIGHT AHEAD IF :

- you want to vary the way you deliver your lessons, possibly incorporate technology into your teaching, offer students greater flexibility to decide when, where and at what pace they want to learn
- you want to free up time in your lessons to encourage in-depth learning through greater student involvement
- you find that students learn better in a relationship in which you're not the only one who has a role. That they benefit from contributions from their peers, external speakers, etc.
- teaching is your passion

PROCEED WITH CAUTION IF :

- you're not at all comfortable with student participation and unexpected situations
- you need to keep tight control of how, and at what pace, the subject is taught
- you teach an introductory course to beginners who aren't yet able to solve complex problems

WHERE TO START?

Rather than flipping the classroom all at once, focus on a particular unit. Is there a part of your course students find boring or confusing? Start with that!

→ The four pillars of the flipped classroom: FLIP*

1 Flexible environment

- **I establish** spaces and time frames that permit students to interact and reflect on their learning as needed.
- **I continually observe** and monitor students to make adjustments as appropriate.
- **I provide** students with different ways to learn content and demonstrate mastery

2 Intentional content

- **I prioritise** concepts used in direct instruction for learners to access on their own.
- **I create and/or curate** relevant content (typically videos) for my students.
- **I differentiate** to make content accessible and relevant to all students.

3 Learning culture

- I give students opportunities to engage in meaningful activities without the teacher being central.
- I scaffold these activities and make them accessible to all students through differentiation and feedback

4 Professional educator

- **I make myself available** to all students for individual, small group and class feedback in real time as needed.
- **I conduct** ongoing formative assessments during class time through observation and by recording data to inform future instruction.
- **I collaborate and reflect** with other educators and take responsibility for transforming my practice.

* Flipped Learning Network checklist

4

Are my students ready?

The flipped classroom requires teachers and students to move away from traditional learning techniques and take on new roles. Today, many flipped classrooms don't work well or don't maximise their potential because those involved don't know how to do this.

WHAT SHOULD I EXPECT?

- Initially, your students are likely to be wary or unenthusiastic. Why?
- Having been used to more conventional teaching methods for a long time, they might be thrown by this active approach.
- Student culture and the pace of the academic year are not conducive to a steady, gradual learning process.
- Coming from an educational tradition that often focused on, and only valued, cognitive procedural skills or even rote learning, students might find it hard to grasp the importance placed on more complex or transferable cognitive skills.
- Most of the time it is only once they've graduated and entered the workforce that they realise the importance of activities involving interaction, problem-solving and creativity.

WHAT I CAN DO AS THE TEACHER

Explain your reasoning from the start

Why are you adopting the flipped classroom method? It's always useful for students to know the reason for their teachers' choices. What led you to rethink your course? Was it to embrace innovation, because you love learning or digital technology, wanted to solve a problem with a course, felt you were running out of steam, or because a colleague's enthusiasm was contagious? It's worth identifying your initial motivations because they can be a great way to get the students on board.

Explain the merits of the flipped concept

It's vitally important for the students to understand the sense and purpose of the concept. What is the flipped classroom meant to enable them to do and why? What is the purpose of the activities they'll undertake? Why is it appropriate at this stage in their education? How will the skills they develop be useful to them in their professional career?

Emphasise the immediate benefits

Students should be made aware of the freedom and flexibility the flipped classroom offers. When supported by a clear structure, this autonomy is a great boost to motivation.

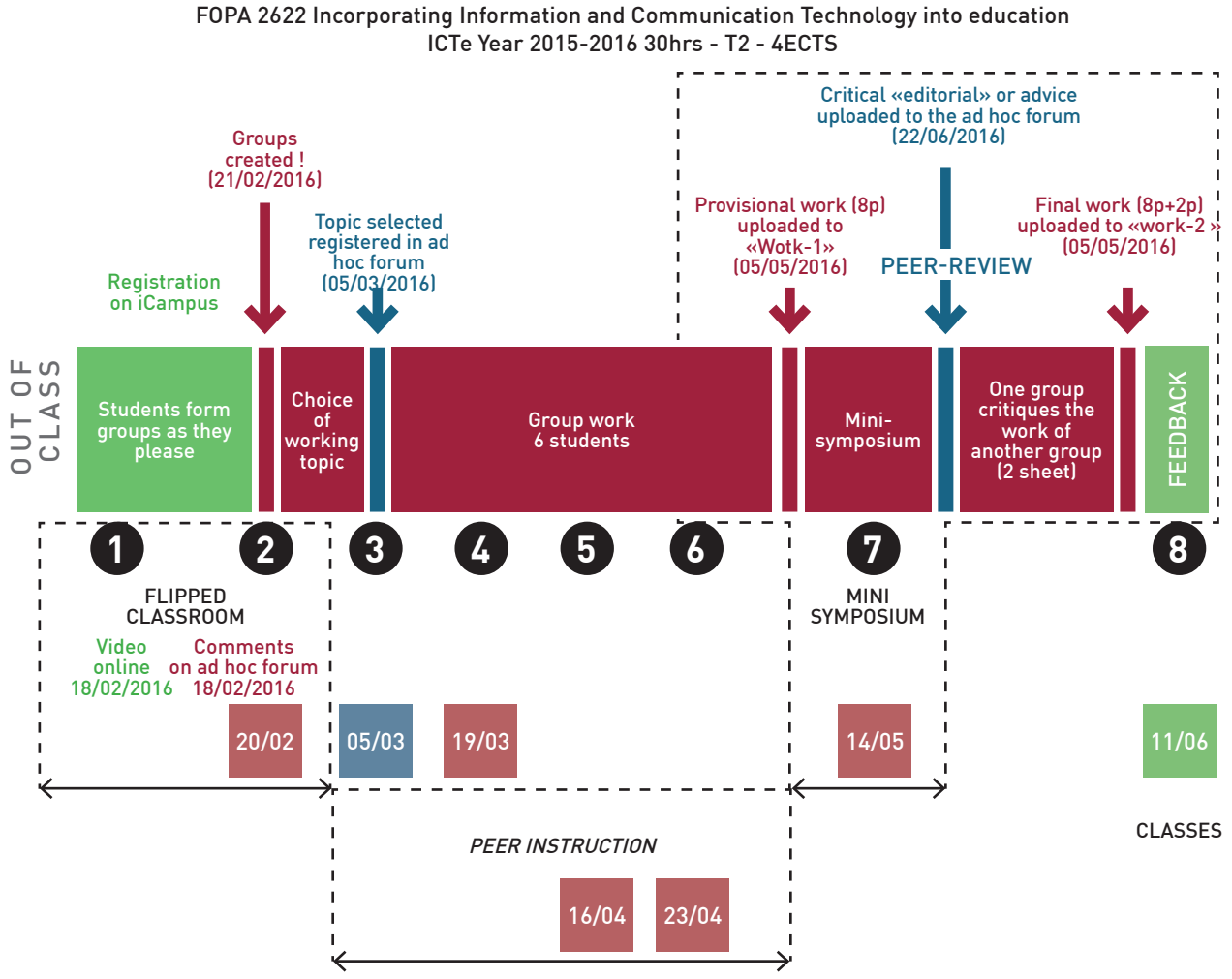
Explain your commitment

If students realise the time and effort you are devoting to the method, it will be another reason for them to embrace the change

5

Set out the markers of a coherent scenario

EXAMPLE



Flipped Classrooms 1 2

To ensure the lessons ran smoothly, students were asked to post their assessment, comments, opinions and questions on the forum set up for this purpose by 18/02/2016 at the latest.

Peer Instruction 3 4 5 6

Topics were assigned to the groups formed and the students were asked to present a brief synopsis (10 min. – TED talk-style) of the resources they had been given (two or three documents: scholarly article, blog post, video, etc.). Another group was given the same documents, but in this case for them to lead a 10-minute discussion following the presentation by the first group. The output and contributions were then pooled by uploading the presentations to the platform.

Mini-colloque et Peer-Review 7 8

Each group presented the work selected (using an IT tool) and completed outside the classroom (summative assessment project). A group of "friendly critics" was tasked with writing a "critical editorial" of the presentation and its content with a view to improving the provisional work submitted. Advice and suggestions for improvement were then uploaded to the ad hoc forum (as soon as possible after the mini-symposium) so that the group "assessed" could take them on board. The "editing" of this critique (positives and negatives in relation to the criteria, what this other work brings to our own work, etc.) was the second part of the summative assessment.

→ A flipped classroom scenario

- incorporates the time spent outside the classroom into the design of the learning activities. The linchpin of the system is the coherence and complementarity between the pre-class activities and those carried out during the lesson;
- sits in a very permeable space between the classroom and the outside world. Because the lesson is transparent and outward-looking, it can feel like a workshop, experimental lab, mini-business, etc.;
- also opens up the educational relationship to other participants who contribute external contexts and realities. By involving the students in a network of relationships and collective projects, the teacher enables them to take on a shared project management role

AIM FOR CONSTRUCTIVE ALIGNMENT

The activities proposed must enable the students to "practise" developing new knowledge, skills and understanding. There's a whole pathway to build and mark out to support student learning. This is known as constructive alignment.

Constructive alignment is an outcomes-based approach to teaching in which the learning outcomes that students are intended to achieve are defined before teaching takes place. Teaching and assessment methods are then designed to best achieve those outcomes and to assess the standard at which they have been achieved [by the students].

(Biggs 2014, pp. 1-2)

6

Targeting learning outcomes (LOs)

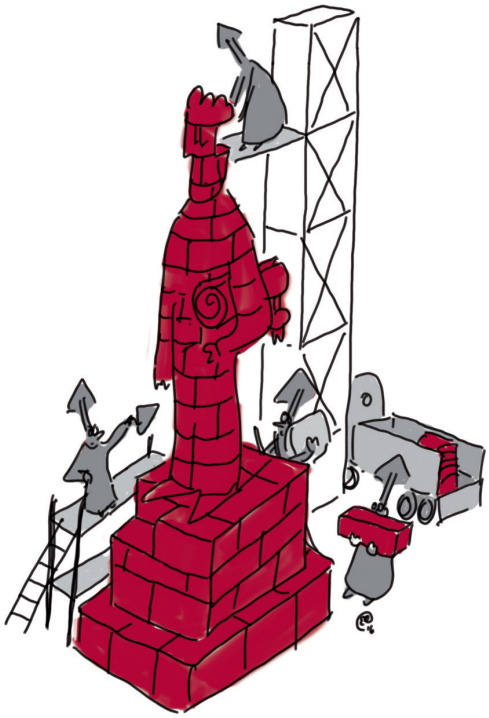
→ How does my course fit into the programme?

It's important to understand where my course fits into the programme, for example to establish links with other courses, ensure the workload is appropriately distributed and adopt a collaborative approach.

POSITIONING MY COURSE IN THE STUDENT JOURNEY

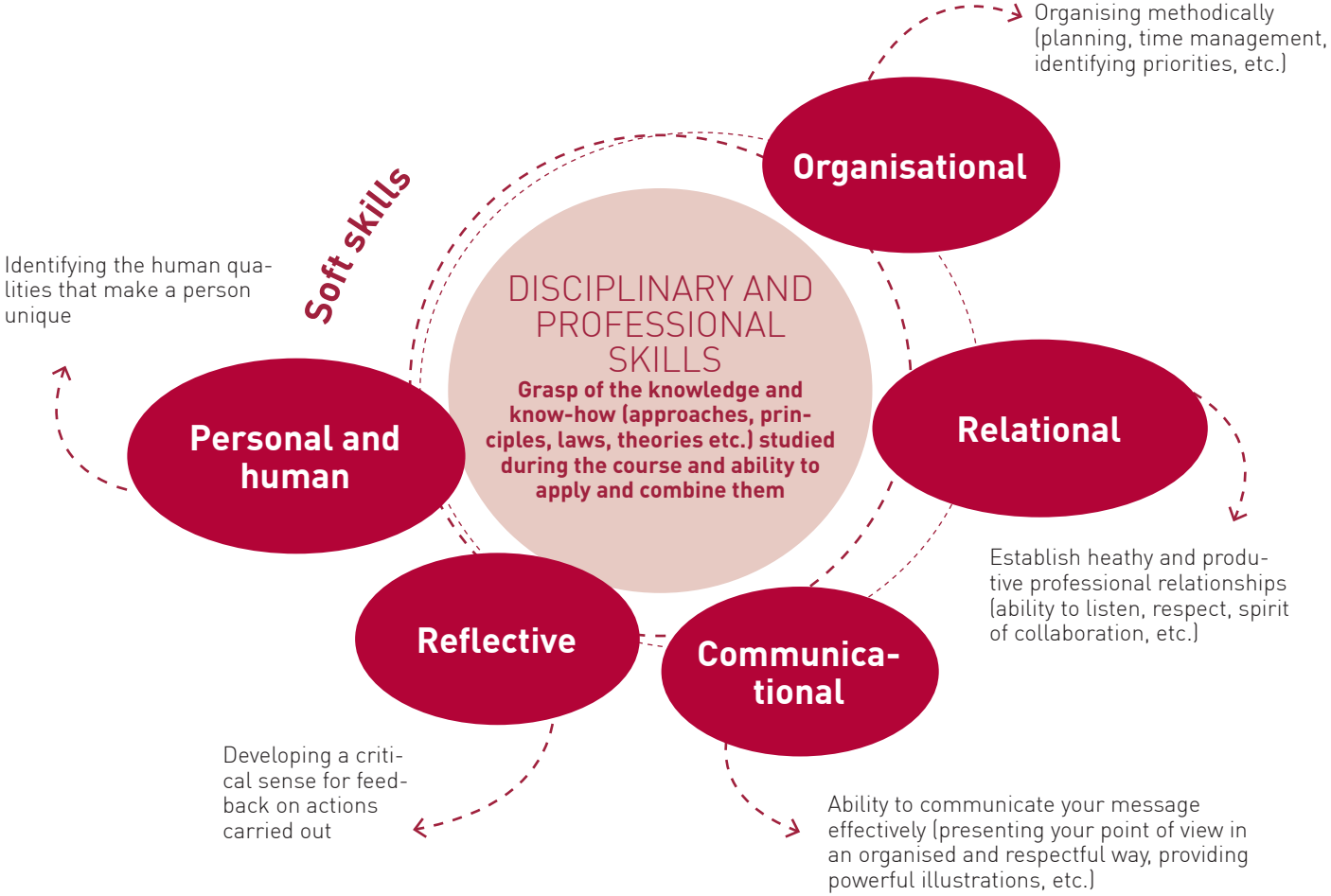
For my course to have a meaningful place in the **student** journey, it must fit into the complete training **programme** on which my **colleagues** are also working.

The learning outcomes of my course are linked to the training project of the overall programme...



→ Complex cognitive skills and transferable skills

The flipped classroom is particularly effective for achieving learning outcomes (LOs) that require complex cognitive processes (applying, analysing, assessing, creating) and those that involve transferable skills:



Typology of the skills to develop with students in the context of a study programme (Prégent, Bernard & Kozanitis, 2009)

For each LO, devise both classroom and non-classroom activities. Try to make them progressive, varied and complementary. An activity to be done beforehand can be reworked or restructured during the lesson, but not simply repeated.

TOOL

Course LO	Non-classroom activities designed to achieve the LO	Classroom activities designed to achieve the LO
LO1		
LO2		
...		
LOn		

TESTIMONIAL

«To motivate my students to do the preparatory activities, I make sure I reinforce them by giving them a bonus point for their contribution»

7

Designing learning activities:
7.1. Organising non-classroom activities

→ Choose, build and prepare the resources

One of the advantages of the flipped classroom is that you can vary, customise, combine and contrast the resources to initiate and enrich classroom learning.

BEFORE CREATING A RESOURCE:

Creating resources is time-consuming. Consider checking to see whether they're already available online! The Internet is a rich source of different types of media of various levels for all disciplines: an excerpt from a news broadcast, a YouTube video on the workings of a nuclear power plant, the solution to a first-order equation on the Khan Academy site, the results of a survey conducted by a daily newspaper, a clip from a documentary, etc.

→ Use open-source materials

How do you know if a resource available on the Internet is "open source"? Read the conditions of use carefully!
Creative Commons licences indicate the authors' willingness to share their creation (subject to specific terms and conditions – see opposite)
Copyright means the authors wish to control the distribution of their work, so you need to contact them beforehand to request permission to use it.
All resources are considered to be copyright protected by default.

WHERE CAN YOU FIND OPEN EDUCATIONAL RESOURCES?

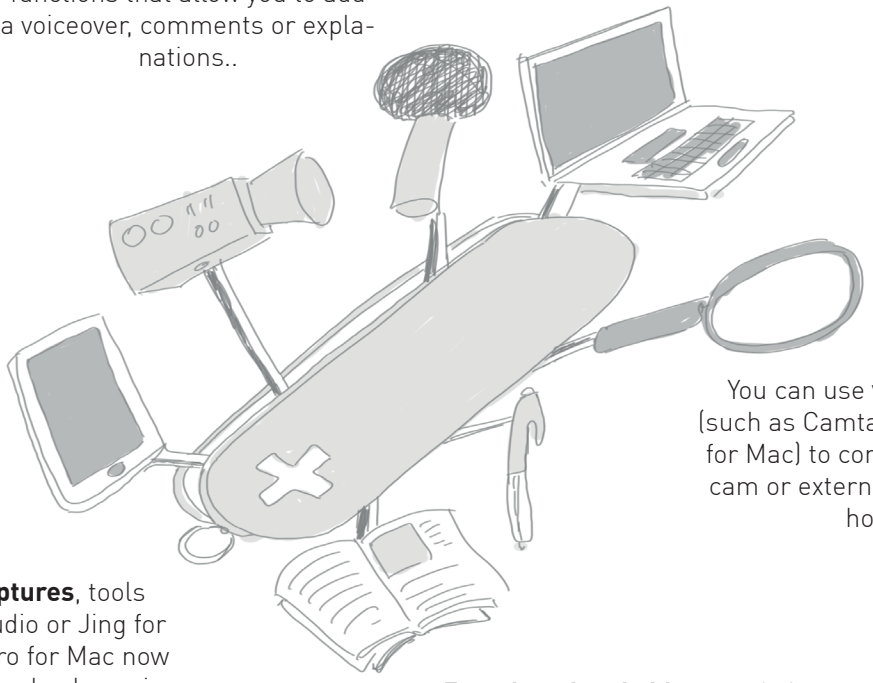
Some examples:
UCLouvain OERs: https://oer.uclouvain.be
Open Education Europa: http://openeducationeuropa.eu/ OER Commons: https://www.oercommons.org/
MIT Open Courseware: http://ocw.mit.edu/
Community College Consortium for Open Educational Resources: http://oerconsortium.org/
In image banks where you can filter images by licence type (choose the Creative Commons licences)
etc.

You can also create a mash-up: combine third-party content from different sources and in different formats. In doing so, you are creating a new original open-source resource for the community.

→ Creating a resource: the toolkit

On a **graphics tablet** (with software such as Explain EverythingTM, for example), you can write with a stylus, record comments or explanations and bring it all together in a video to upload online.

Presentation tools (such as PowerPoint or Keynote) have functions that allow you to add a voiceover, comments or explanations..



You can use **video editing software** (such as Camtasia for PC or ScreenFlow for Mac) to combine video (from a webcam or external camera) and screenshot recordings.

For **screen captures**, tools such as CamStudio or Jing for PC and Snapz Pro for Mac now allow you to record a dynamic video of your computer screen activity (screencast).

For **educational videos**, websites such as icole.fr (in French only) allow you to create multimedia content directly on the web using a video recording and a PowerPoint, for example, and to save it for subsequent distribution.

WHAT I CAN DO AS THE TEACHER

1. Search the web for information about the tool in question
2. Research how it has been used for training and teaching experiences
3. Investigate the instructions for use (the manufacturer's or user-created instructions)
4. Give the tool a go by creating dummy users or asking colleagues to take part in the trial
5. Devise a short experimental classroom activity involving the students: discuss using it with them (potential and risks) and/or write a user charter
6. Consider what type of support (technical, cognitive, metacognitive) the students will need
7. Incorporate the tool into a process by creating a diagram of the different stages and activities and ensuring they form a coherent whole

TESTIMONIAL

«I noticed that when the technological challenge was too ambitious or too restrictive, the students either lost motivation or completely missed the point of my exercise. It sometimes takes a bit of time to find the right 'cost/benefit' balance.»

→ Organising your resources: Web 2.0 tools

To design or create new content in different formats (text, video, animations, diagrams, conceptual maps) and enable it to be collaboratively published and disseminated: **Google Docs, Framapad, Mindomo, XMind or CmapTools**

To identify a community and organise information on a social media platform: **Google+, Yammer or TodaysMeet**

SPOTLIGHT
on what makes a good video

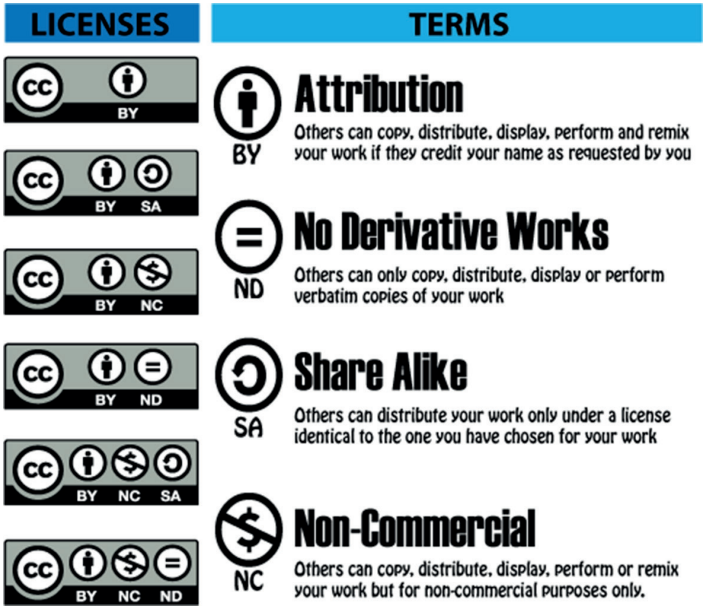
- Short videos are better received: student engagement diminishes after 6 minutes
- Presentations that show the teacher's face, preferably on alternate shots, are better received than those that don't
- Videos recorded in an informal or context-specific setting are preferable to studio recordings
- Tablet recordings are more likely to get students' approval than a standalone PowerPoint presentation
- Students like to be able to sense the teacher's enthusiasm in a video

→ Sharing your output under a Creative Commons licence

Have you produced a learning resource (video, article, syllabus, etc.)? Why not make it available to others as an OER (open educational resource) by uploading it to the web or another platform for distribution?

If you do this, use Creative Commons licences to specify the type of use you are authorising. There are six to choose from, each of which grants slightly different rights: others can/cannot modify your work, others can/cannot use it for commercial purposes, etc. Attribution is always required: your name must be cited as the author of the work.

Place the appropriate logo on your work and create a hyperlink to the page that explains the terms and conditions of the licence you have selected, on http://creativecommons.org/



→ Never just upload the resources

You've selected a fascinating article or created an interesting clip, but your students might miss the point if you haven't included guidelines, tasks or criteria you have explained, or even negotiated, with your students.

EXAMPLE

- Ask them to watch and analyse a video or a text and, individually or as a group, formulate arguments for or against the statements made in preparation for the forthcoming lesson
- Ask them, individually or as a group, to find illustrations, examples or applications to present to their peers
- Ask students to read a short text or watch a video that contains controversial opinions on a specific topic or issue and then construct a debate on the points made
- Assign students, or groups of students, roles through which they must deliver a summary, arguments for or against or examples in class
- Ask them to propose solutions to the problems raised in the video or text
- Ask them to complete short online questionnaires or comment on a forum so you can gauge what they have and have not understood

IDEA

How about asking your students to make their own resource?

→ Organising group work outside the classroom

Choose group work if you're looking for...

...creativity, different viewpoints, critical thinking, reasoning strategies, transferable skills (communication, organisation, cooperation, etc.)

Use it...

...for a task that's sufficiently complex to require input from several students and can create a positive interdependence between the group members

THE GROUP CONTRACT

The group must set out the foundations of its collaboration by drawing up a contract, having it signed by all members and giving it to the tutor/teacher. It can be structured around the following considerations:

- What outcome do we want to achieve?
- What are our expectations (frequency of meetings, communication methods, quality of work)?
- What rules can we set to help us meet our objectives and expectations?
- What action will we take if the objectives or expectations are not met or the rules are not complied with?

FOR MORE INFO >
(Villeneuve & Levasseur, 2010)

What makes a good group?

- ✓ A shared objective
- ✓ Diversity
- ✓ Personal commitment
- ✓ Organisation, assigned roles
- ✓ A leader (tutor/supervisor)
- ✓ Members who get along well

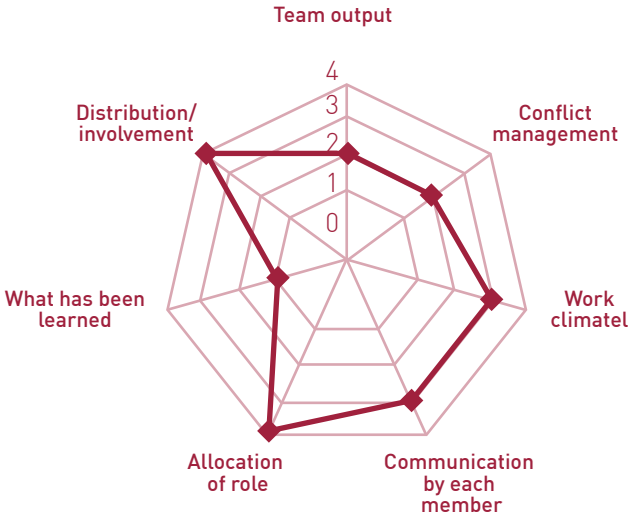
→ Regulating group work: the tools

EXAMPLES

The plan of action

HOW IT WORKS

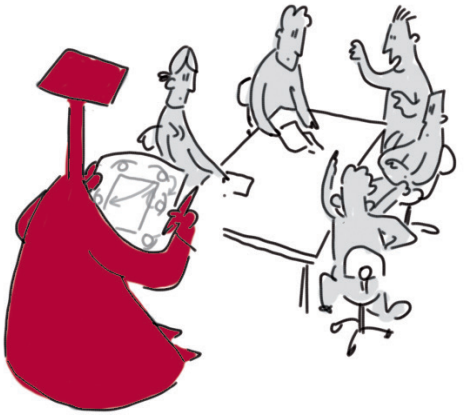
1. Individually each member fills in the target (marking the levels on the axes and joining the dots to create a "radar")
2. As a group: present all the concurring group sheets and identify areas of disagreement
3. Discuss these areas and suggest how to move forward



The communication diagram

HOW IT WORKS

1. For a maximum of 2 minutes an external observer maps out the group using arrows (one arrow = one intervention)
2. The observer does this two or three times during the session
3. The group examines the diagrams together and identifies sub-groups and students who don't talk/talk too much
4. Rules are suggested to remedy the situation



7.2. Livening up the lesson

Initially, it's sometimes difficult to know what to do with the time freed up by the preparatory work. What do you do with your students if they have received part of the lesson in advance? How do you create a new classroom space that's more interactive and focused on solving complex tasks? If you need help to do this, you can refer to the extensive list of active learning activities available!

WHAT IS A MOTIVATING TASK? (VIAU, 2009)

To be motivating, an activity must:

- Give students the responsibility to make choices
- Be relevant on a personal, social and professional level
- Be of a complex cognitive level
- Be interdiciplinary
- Be productive
- Present students with a challenge
- Allow interaction between students
- Be allocated sufficient time
- Have clear guidelines

→ Reach out to the students

Classroom assessment techniques (CATs)
Classroom assessment techniques make it possible to gauge what the students have learned and, where necessary, adapt lessons and/or learning strategies. Teachers should briefly stand back and ask themselves four questions (Bachy & Lebrun, 2009).)

Who are my students?

- Who do I have in front of me?
- Where do my students come from?
- What brought them here and where do they want to go?
- What are their interests?

What do they know?

- What is their perception of knowledge?
- Do they have any preconceptions?

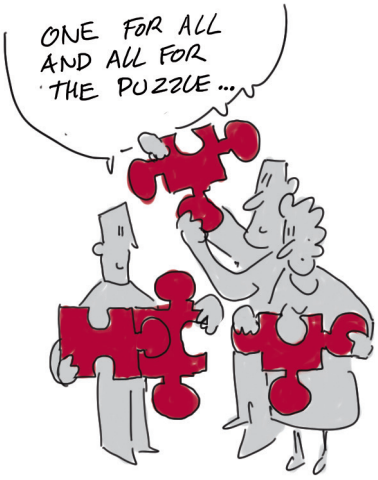
What have they learned?

- How can I check they have understood properly?
- Is there any gap between my expectations and what they have learned?

- **How do they learn?**
- How do they organise all the concepts covered?
- Have they set aside any study time?

→ Collaborative activities in the lecture theatre

- Another way of breaking up a formal lecture is to use short, easy-to-prepare exercises that have the advantage of:
- involving the students
- keeping their attention
- encouraging peer discussion
- developing critical thinking and in-depth learning



THINK-PAIR-SHARE

5-15 MIN

THINK: individually, students think about a question the teacher has asked and write down their answer
PAIR: the students compare their answer with that of their neighbour(s) and try to reach a consensus
SHARE: the teacher questions the student groups, writes the answers on the board and leads the plenary discussion.

WHAT I CAN DO AS THE TEACHER

Groups of students give PowerPoint presentations in the lecture theatre. Have you thought about doing it differently? What about a poster session, an exhibition, a panel, an open debate or a simulation exercise?

THE JIGSAW PUZZLE

20-30 MIN

The teacher prepares a series of questions or a list of resources to be consulted. The students are split into groups.
Expert group: each group of students receives a question/ resources to research further
Learner group: the groups are then reorganised to ensure that each one has students from each expert group so that they can share their findings.

MINI-QUIZ

5-10 MIN

The teacher prepares slides with multiple-choice questions. The students select the answer they think is correct from the different options displayed and vote (using voting boxes, online tools or flash cards). Based on the number of correct answers, the teacher can clarify any areas that have not been fully understood.

THE CONCEPTUAL MAP

20-30 MIN

Once a good chunk of material has been covered in the course (topic, unit, sections, etc.), **the teacher asks the students to create a conceptual map indicating what they have learned**. Working in pairs, the students brainstorm the key concepts learned and the links between them. The teacher moves among the teams observing and answering questions.

PHILIPPS 6/6

15-25 MIN

The teacher splits the students into groups of six and each group has six minutes to solve a problem.
A reporter from each group then presents the solution to the whole class. Each group writes a summary based on the input from all the groups.

TESTIMONAL

«Right from the start I told my students that we would have regular brainstorming activities in the lecture theatre and explained why. The first activity was tricky to organise but, for both myself and my students, it was simply a matter of getting used to them»

TO FIND OUT MORE > (Daele dans Rege Colet, 2015)

→ Motivate your audience with an electronic voting system

Your students' votes are instantly collected and processed in the lecture theatre

Students communicate their answers using:

- voting boxes
- smartphone, laptop, tablet, etc. (on a dedicated website)
- flash cards (different colours or with QR code)
- etc.

The responses are displayed immediately using suitable software on the teacher's computer.

TESTIMONIAL

«We didn't wait until electronic voting systems came on the scene to ask our students questions. What does this technology offer that's new?!"»

- **Distribution of answers displayed in real time**: teacher can poll all the students and, on rarer occasions, a few volunteers from the audience.
- **Anonymity guaranteed**: students can answer the questions without fear of being ridiculed or penalised (compared with a show of hands).
- With new technologies, there's **no need to buy voting boxes**: increasingly, online solutions allow students to answer by text message or using their wifi-connected mobile phone.
- With these new technologies, the question format can be expanded to include, for instance, **open questions and comments**.

A regularly updated list of voting systems can be found on the LLL website.
www.uclouvain.be/louvainlearninglab

→ ELECTRONIC VOTING TECHNOLOGY: suitable for a wide range of teaching aids!

SAMPLE MULTIPLE-CHOICE QUESTIONS TO ASK STUDENTS:

- whether a concept has been properly explained
- the correct answer in an exercise
- how they have interpreted a graph
- whether a phenomenon has been adequately explained
- the best way to deal with a practical problem
- their opinion on a controversial matter
- etc.

AT THE OUTSET

«I use electronic voting as a way to engage discussion on a topic and highlight any discrepancies in the answers.»

AS A REMINDER OF THE PREREQUISITES

«I begin a new topic with a few questions to remind the students what we covered in the previous classes and what they'll need to focus on in this one.»

TO PREPARE FOR AN EXAM

"At the end of each chapter I allow the students to practise answering the questions I'll set in the exam."

AS A FLIPPED CLASSROOM RESOURCE

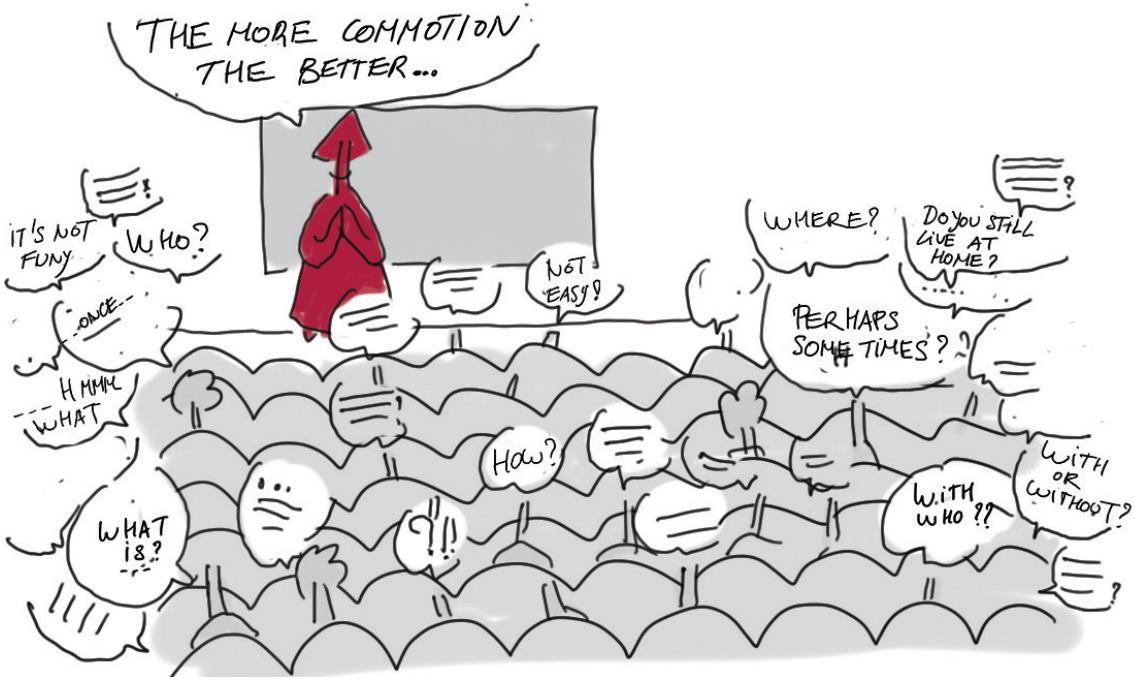
«I ask the students questions about what they had to read before class. This is not to check that they did actually read it… however, they soon realise that, if they haven't done the reading, they won't be able to do the practical exercises I set them.»

FOR FEEDBACK

«A mini-quiz is an easy way to assess whether or not the most important points have been understood.
I ask these questions at the end of the class so I can adapt the next one accordingly.»

TESTIMONIAL

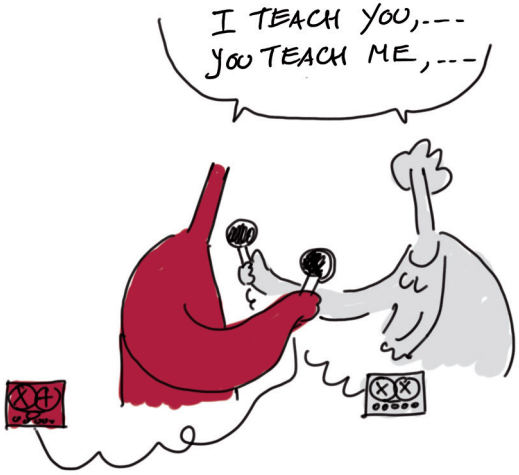
«The more chaotic the discussions, the more I know that my question is working well. As soon as I announce that I'm going to present the results, the room goes quiet!"»



SPOTLIGHT
on a teaching aid: peer instruction (Mazur, 2014)

HOW IT WORKS

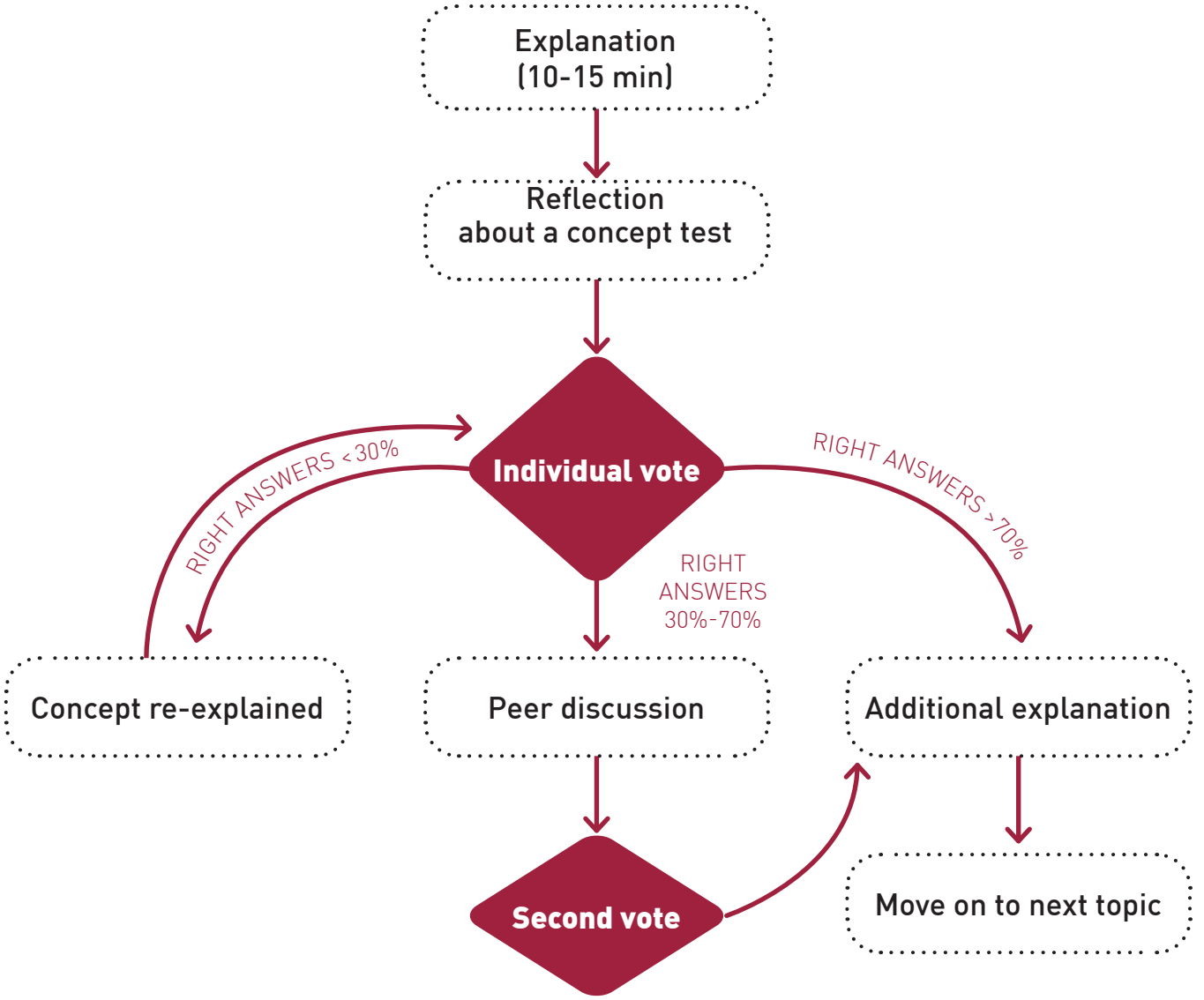
Students are asked a series of conceptual questions during lectures and must then reflect, vote, listen and present a convincing argument. While they do this, the teacher circulates among the groups listening to "naïve conceptions". Traditionally, the right answer emerges from peer discussion. The teacher can then summarise, break down, add to and comment on the arguments heard, etc.



A **concept test** is a multiple-choice question used to check that the student has completely understood.

- It uses students' naïve conceptions as distractors
- It is neither too easy nor too difficult
- It is stimulating, intriguing and challenges the student

STANDARD PEER-INSTRUCTION SEQUENCE



8

Assessment

The flipped classroom raises serious questions about "standard" assessment procedures, which require students to reproduce knowledge and apply it in a clearly defined academic field..

- It will be more formative, conducted over a short cycle
- It will cover the process, not just the result
- It will involve other parties: the student (self-assessment), the student and the teacher (co-assessment), peers (peer assessment)

The assessment of students in flipped classrooms (Lebrun, 2015) will involve and engage them at a very early stage in the processes of:

- empowering students by allowing thm to marke choices
- designing scenarios and problems
- identifying procedures and expected output
- creating indicators of the skills used
- managing the jointly created teachin aids
- sharing responsibilities within the groups
- ealuating these different elements

Formative assessment strategies can be freely and explicitly incorporated into the flipped model itself

FORMATIVE FEEDBACK

Assigning tasks to be completed outside the class encourages teacher/student interaction. This interaction is the key to a joint knowledge-building exercise in which the teacher's role is still to answer questions, shift the focus and offer different explanations. In other words, teachers are able to offer formative feedback to provide direction and guidance, correct, etc.

JUST-IN-TIME TEACHING

This is a variant of formative feedback and is derived directly from the opportunities offered by the blended learning concept of the flipped classroom. When using the just-in-time teaching method, developed by Eric Mazur's team, teachers set students pre-class assignments so they can review their input based on the progress made. It is unique in that it enables teachers to assess the impact of their teaching and react quickly by making adjustments to their planned classroom activities.

→ Four assessment methods for the flipped classroom

Using a "traditional" assessment method to evaluate a new and innovative system could produce less than perfect results or fail to take account of certain achievements. To ensure the assessment is aligned with the objectives and the system itself, an appropriate method must be used.

1 Selected or self-directed assessment

This method gives students significant autonomy to decide when they will be assessed and what questions they will be asked. Students may even be tasked with setting their own exam questions.

2 Peer assessment

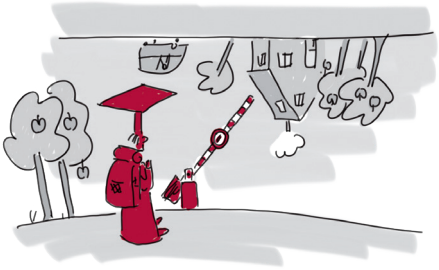
This involves students in the assessment process by allowing them to assess the work of another student against a set of criteria. It has been shown that the formative element of peer assessment is producing the feedback rather than receiving feedback from others.

3 Building a portfolio

A portfolio is a "purposeful collection of work that demonstrates the student's efforts, progress and achievement in one or more areas". This assessment tool is designed to support both reflective learning (developing a type of self-assessment) and experience-based learning (collecting and evaluating learning experiences). The primary aim is for the students to take ownership of and responsibility for their own learning. In this respect, the portfolio lends itself well to the very personal and progressive aspects of soft skills.

4 Assessment in real-life situations

Flipped classrooms lend themselves well to traditional assessment methods, provided they reflect the activities within the teacher's course material. Examples include presentations (symposium, conference, etc.), peer assessment, role-play and simulation, creation of a work, exhibition, moot court, simulation of a panel of experts, problem-based learning, case studies, writing of a scholarly article, production of a personal or collective manifesto (Prégent et al., 2011).



In conclusion

We hope that you will use this practical guide as a starting point to try out the flipped classroom. Give this ongoing educational experiment a go for a few hours of your lessons, in a module or for one of your teaching units!

This guide provides a series of markers that you can explore in more depth and document with the help of the suggested bibliographical sources.

The key challenge of the flipped classroom is surely managing to strike a balance between the system's aims, techniques, tools and assessment methods, and the variety that is conducive to learning.

Enjoy the journey and let us know how you get on in this flipped environment...

Marcel Lebrun et Julie Lecoq

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https://www.knewton.com/infographics/flipped-classroom/
https://www.panopto.com/blog/infographic-impact-of-the-flipped-classroom/

VIDEOGRAPHICS
Flippons nos cours : http://bit.ly/AIPU-TR
La classe inversée en 4 minutes : http://bit.ly/CI-4min

NETWORKS OF FLIPPED CLASSROOM RESEARCHERS/PRACTITIONERS:Inversons la classe ! : http://www.laclasseinversee.com
Flip learning network : http://www.flippedlearning.org

Initially, the flipped classroom was described as “lectures at home and homework in class”: technology was used to transfer the mainly theory-based part of a course out of the classroom to free up more time during the lesson to focus on applications, problems, case studies or projects. However, the concept was very quickly broadened by extending the range of non-classroom activities. Should we just expect students to passively watch videos suggested by the teacher? Or should be we asking them, individually or in groups, to prepare part of the course for the other students before class?

Of course, we want a method that is coherent, particularly in terms of time and space; it requires an important adjustment of the knowledge and skills targeted, the resources allocated to out-of-class activities and the learning activities and interactions inside and outside the classroom.

But how do you create the teaching aids and design the pre-class preparatory activities? How can you make the space/time encounter between students and with the teacher more active and meaningful? How can you use the flipped classroom concept to really add value in terms of quality of learning and sustainable skills? Lastly, how do you assess how the students are using these skills?

This short guide aims to answer some of the questions you may have about the flipped classroom and help you embrace the truly ground-breaking opportunities of this teaching method of the future.

PÔLE LOUVAIN
LOUVAIN LEARNING LAB
UCLouvain