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FLED LEARNING DESIGN FOR FLEXIBLE EDUCATION

Key decisions for an effective flipped classroom

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Erasmus+ FLeD Learning design for flexible education

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Keywords[1]

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Characteristics of the course

This pattern is designed for teachers who have already implemented the flipped classroom (FC) in higher education. This pattern has been specifically tailored for use with a group of 80 second-year students. It can also be a useful tool for teachers unfamiliar with FC, as well as for different educational levels and smaller class sizes. Teachers with previous experience in FC could benefit more from this pattern by selecting the specific actions that need revision. Additionally, students at higher degree levels might benefit more from flexibility, inclusiveness and options for self-regulation. Finally, having fewer students in a group can lead to more personalized practices.

Context and main problem (or motivation) to be solved

The FC has gained popularity in recent years, particularly during the pandemic as a response to the need for online and blended (i.e., which combines in-person and online learning environments) modes of teaching and learning. As a result, teachers have developed digital competences and have broadened their perspective towards flexible forms of learning[2] (Albó et al., 2020; Noguera & Valdivia, 2023). However, FC

[1] Consult the FLeD patterns glossary to learn more.

[2] Flexible learning refers to a teaching approach that offers learners the ability to overcome limitations of time, place, and pace by providing choices to meet their individual needs. Consult Dikilitas & Noguera (2023). *Conceptual framework for flexible learning design: The Context of flipped classroom.* https://doi.org/10.31265/USPS.267

designs sometimes do not lead to the expected increase in academic performance, motivation or self-regulation[3]. **The main issue with FC is its ineffectiveness when students fail to regulate their learning, prepare before class, or collaborate properly and when the flexibility options make them feel lost** (Jones et al., 2021; Lai & Hwang, 2016; Sein-Echaluce, 2022; Silverajah et al., 2022).

One reason for unsuccessful FC is to understand it as a mere adaptation of traditional content-based instruction to online or blended modes of teaching (Weiss & Friege, 2021). Such a traditional approach may overlook the active and social nature of the FC and adopt technologies from a reductionist view. Furthermore, an FC design without adequate guidance for self-regulated learning processes and the intensive use of digital technologies might represent a barrier to students with special needs, special circumstances, or low self-regulation or digital competencies (Baig, 2019; Sosa-Díaz et al., 2021; Sun et al., 2018). All these aspects may affect the correct implementation of FC and harm academic performance, motivation, and self-regulation, leading to unsuccessful learning experiences.

Another reason for failure when implementing FC is to misinterpret the concept of flexibility. Flexible education is not spontaneous; it is planned and requires a detailed pedagogical design to facilitate the customisation of learning (Noguera et al., 2023).

Main need to be addressed

Strategies for effective FC in higher education.

General learning outcomes to be achieved

Engage in interactive learning experiences throughout the flipped experience.

[3] Self-regulated learning refers to learners taking charge of their own learning process by actively managing and overseeing it.

Solution that could solve the problem and need
Implement strategies for flexible, inclusive, self-regulated and collaborative learning using digital technologies.

ACTION 1. **Offer flexible learning options**	• **Environments**	
	Design your learning scenario profiting from the face-to-face and virtual spaces. Design your course or unit considering which context learning will be most meaningful. Several delivery modes result from the combination of virtual and onsite, as well as synchronous and asynchronous spaces, such as fully online learning, fully onsite learning, mobile learning, blended learning, or hybrid flexible learning[4].	o Use **onsite and synchronous spaces** (i.e., real-time interaction), for instance, when topics need to be discussed, when there is a need for reflection or demonstration, or when you need fluent communication and teamwork. For instance, seminars. o Use **virtual spaces and asynchronous communication** (i.e., not real-time interaction) to reach large audiences, for one-way information, to prompt autonomous work and self-reflection, or to facilitate communication when students are physically distant. For instance, lectures. o Learning Management System -LMSs usually include customizable options for teachers but are limited in flexible learning as students have limited choices regarding the virtual space. Combining them with tools for **microlearning or personal learning** environments could bring

[4] Consult the FLeD patterns glossary for clarification.

<table>
<tr><td rowspan="3">ACTION 1.
Offer flexible learning options</td><td></td><td>personalisation to the learning experience. The use of AI conversational agents could be of help for that purpose.
o Physical spaces also need to be flexible to meet the pedagogical approach. It implies the possibility of using the classroom in a variety of ways. It includes moveable furniture, break-out spaces, or diverse seating arrangements and spaces.</td></tr>
<tr><td colspan="2">• Time</td></tr>
<tr><td>The FC permits surpassing time constraints. Use synchronous and asynchronous communication appropriately. Not all tasks require all students to be together at the same time.</td><td>o Give options to meet synchronously when necessary or at the student's convenience and let students organise their time and work during their asynchronous time.
o In the FC, the time spent outside of the classroom has value; it is an active time where they consult resources and perform activities. Give them options to consult resources at any time and from anywhere.
o Agree with your students' time slots and days for synchronous connection in online communication.
o The length of the flipped experience may vary. You can flip a whole course or just a learning unit or topic. To be effective, a minimum of time is required to let students prepare for the session, apply their knowledge, get feedback and reflect. We recommend flipping at least four sessions or a couple of weeks.</td></tr>
</table>

Pattern "Key decisions for an effective flipped classroom"

<table>
<tr><td rowspan="4">ACTION 1.
Offer flexible learning options</td><td colspan="2">• Pace</td></tr>
<tr><td>Prompt self-paced learning. Students have different profiles, learning experiences, needs, and motivations. Give them options to learn, considering their own time and schedule.</td><td>o Propose self-assessment activities in the form of diagnostic evaluation to let students be aware of their learning needs. Tools like Wooclap or Socrative permit interactive questioning.
o Offer different pathways with different deadlines that can be decided based on student's goals.</td></tr>
<tr><td>• Learning resources</td><td>o Offer the possibility to consult the sources in a different order to meet the needs or knowledge to be acquired based on each student profile.
o Suggest sets of resources that students can select to gain different levels of knowledge according to their interests, prior knowledge, or learning goals.
o Propose lessons and course materials of different lengths and formats that students can select and decide the time period they want to invest in.</td></tr>
<tr><td>• Digital technologies</td><td>o Provide a range of tools and support to be used and the possibility to use the tools students are more familiar with.
o Offer diverse communication channels (forum, chat, videoconference, e-mail).</td></tr>
</table>

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<table>
<tr><td rowspan="4">ACTION 1.
Offer flexible learning options</td><td>• Learning activities</td><td>o Permit delivering activities in different formats, especially for those students who struggle with some formats due to their special needs.
o Be open to rescheduling the deadline of learning activities when the whole group demands it, and there is a strong reason for it.</td></tr>
<tr><td>• Grouping</td><td>o Give students the choice to work in pairs or small groups if they need to exchange ideas. Bear in mind the needs of students with special conditions to form these groups and include them in social interactions.
o Propose assessment activities with diverse grouping systems.</td></tr>
<tr><td colspan="2">• Assessment</td></tr>
<tr><td colspan="2">Students have diverse abilities, and it is key to allow them to demonstrate their learning in diverse forms, such as a test, a case study, a critical essay, or a report.</td></tr>
<tr><td></td><td colspan="2">• Teaching delivery mode</td></tr>
<tr><td></td><td colspan="2">Be open to changing the teaching delivery mode for a period or the whole course if there are teaching or learning needs that support that decision.</td></tr>
</table>

ACTION 2. **Design under an inclusive perspective**	o Guarantee that the needs of Special Education Needs and Disabled (SEND) students are considered and the necessary **adaptations** are made **in the course materials and evaluation**. The intensive use of digital tools and resources may have a negative impact on SEND students. Be aware of the adaptations they need, such as the format of resources, the use of text and images, or the need for subtitles or transcripts. For example, audio or video recordings, transcripts, course presentations, and other materials can be converted to other modalities, from verbal to written, so that they can be used by diverse students and in various environments for many purposes. It is recommended to bear in mind the Universal Design (UD) principles. Universal Design principles aim to create products, environments, and systems that are accessible and usable by all people. These principles include equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use.
	o The FC promotes the consultation of resources before in-class activities. It is crucial to provide **electronic resources in advance** to permit students to consult them during a period of time.
	o Implement **person-first language** to be used for people with disabilities.
	o Prompt **diversity** in the groups of students, especially when instruction is only given online.
	o Students with disabilities need to be able to **access all the learning activities** and achieve the equivalent learning outcomes in all participation modes.

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ACTION 2. **Design under an inclusive perspective**	o **Accessibility** enabled by course materials and activities accessible to all students is also key to making it possible for students to participate in alternative modes.
	o Students with disabilities need essential **technological facilities** with which they need to be equipped and the varied learning-mode abilities which help them make legitimate choices about participation.
	o The pedagogical choices of **mode of delivery** (online or face-to-face) and **mode of participation** (synchronous or asynchronous) are essential for students with SEND. Students with SEND are a heterogeneous group, for some, online learning is more appropriate and for others, face-to-face.
	o Providing a **choice of participating** for students is fundamental to enabling flexibility.
	o **Incorporate marginalised groups** (i.e., by gender, sexual orientation, disability, Indigenous, race/ethnicity) in the resources and learning activities by: a) prompting co-design, participatory strategies and horizontal dynamics, and b) generating learning resources where they are integrated.
	o Design the learning scenario to be **equal for all genders**. For instance, use forms of address and pronouns that are consistent with gender identity. Questioning the design of your course in terms of androcentrism, ethnocentrism, or heterocentrism could help to identify areas to be improved.

<table>
<tr><td rowspan="3">ACTION 3.
Give guidelines for self-regulation and diversify feedback</td><td colspan="2">• Help students self-regulate</td></tr>
<tr><td>Provide opportunities to monitor their learning by using cognitive, metacognitive, motivational, behavioural and emotional strategies. Self-regulated learners can move from the forethought phase (task analysis) to the self-reflection phase (evaluation of performance) through the performance phase (active monitoring of the progress). (Panadero, 2017).</td><td>o Offer them opportunities to reflect on their goals, interests, or planning during the forethought phase (e.g., ask how much time they will need to accomplish this task or facilitate a rubric[5]).
o Give instructions to self-record their performance during the performance phase (e.g., ask which difficulties they encountered during the performance of an activity, propose to create a portfolio[6] or give examples of excellent projects)
o Provide instruments for self-evaluation in the self-reflection phase (e.g., peer or co-evaluation instruments or completing a quiz[7]) to prompt feedback and reflect. We recommend flipping at least four sessions or a couple of weeks.</td></tr>
<tr><td colspan="2">• Consider regulation profiles</td></tr>
<tr><td>In the FC, self-regulation plays an important role, especially during preparation time (consult the "Prior preparation" pattern to learn more).</td><td>o For those students with self-regulation skills, the FC will be more profitable. However, to get the most out of their learning experience, it is crucial to provide them with minimum indications</td></tr>
</table>

[5] A rubric is an assessment tool used to evaluate and grade students' work by providing specific criteria and performance levels.
[6] A portfolio is a collection of a student's work (e.g., assignments, projectes, reflections) that demonstrates their learning progress, achievements, and abilities over time.
[7] A quiz is a short test or assessment used to quickly evaluate students' knowledge or understanding of a specific topic.

ACTION 3. **Give guidelines for self-regulation and diversify feedback**	Different regulation profiles can be summarised as follows: students with self-regulation skills (e.g., defining and planning goals, organizing and prioritising tasks), students that need external regulation (i.e., teacher, colleague, resource) and students without regulation skills.	of what is expected from them in the course, unit or activity. For instance, they can be informed about time dedication or assessment criteria. o Students with external regulation skills will need support to follow the FC experience. They can get lost if there are no specific processes or content **guidelines**. For instance, you can create video lessons enriched with questions for reflection, give instructions to guide the consultation of a resource or propose creating concept maps of the resources consulted. Miro, Cmap Tools, and Whimsical are interesting tools for developing concept maps. o The most challenging part is supporting students without regulatory skills. They will probably need more **external regulation** than other students, activities to be conscious of their need for regulating learning, and personalised guidance to achieve their learning goals. Help them by proposing tasks to plan their work and goals or offering complementary instructional resources.
	• **Design and plan feedback**	
	In the FC, there is an increase in the personalisation of learning[8] and more evidence	o **Immediately/delayed** (e.g., questionnaires with automatic response/qualitative feedback).

[8] An instructional approach that tailors the learning experience to meet the individual needs, interests, and abilities of each student.

ACTION 3. **Give guidelines for self-regulation and diversify feedback**	of the work done at home. Invest more effort in designing and planning opportunities for formative and continuous feedback to help students progress by informing them about their strengths and weaknesses. The feedback can be given by the teacher, peers (consult the "Enhancing constructive feedback pattern" to learn more), the student itself, or a computer system. Furthermore, this feedback can be delivered in various ways.	o **Single/multiple tries** (e.g., an assignment/a project that can be delivered several times, and the feedback incorporated to improve the learning product). o **Adaptive or nonadaptive form** (e.g., feedback that is personalised to students according to their response to a task/general feedback given to the whole group) o **Unimodal or multimodal form** (e.g., written form/combination of modes).

<table>
<tr><td rowspan="3">ACTION 4.
Promote active, social, and collaborative learning</td><td colspan="2">• Organise onsite and out-of-class moments</td></tr>
<tr><td>The FC transforms onsite and out-of-class moments. Facilitate students' active participation in the course by proposing resources and activities outside the classroom. Therefore, it is important not to offer just resources to consult but tasks or activities linked to these resources to acquire knowledge, reflect, and develop competences. You can follow Bloom's Taxonomy[9] to organise the moments where thinking skills are implemented (although all skills could be developed at any moment if desired). In this manner, the student continuously participates in his/her learning in and outside the class. Examples of active learning approaches usually integrated into FC models are gamification, problem-based, and project-based learning[10].</td><td>o Low-order thinking skills (remembering, understanding) are developed through activities before the class.
o Middle-order skills (applying, analysing) are done in class.
o High-order thinking skills are demonstrated after class (evaluating, creating).</td></tr>
<tr><td colspan="2">• Encourage collaborative learning</td></tr>
<tr><td colspan="2">Transfer the consultation of contents to the autonomous time release in-class time for interaction-based activities. It is crucial to profit from the synchronous time to exchange ideas, negotiate with others, and build knowledge together. In social learning, students learn by observing others. In collaborative learning, students share a common goal and negotiate and build knowledge together. Some tips to encourage collaborative learning under a flexible approach are:</td></tr>
</table>

[9] Consult this page to know more. A new taxonomy in the age of IA has been launched here.

[10] Consult the FLeD patterns glossary for clarification.

ACTION 4. **Promote active, social, and collaborative learning**

- **Group formation**: allow students to form their groups to ensure more motivation and a sense of ownership.
- **Goal setting:** transmit the need to focus on the process of working together to achieve a common goal or complete a task. It is crucial to give indications, and assess and monitor group progress rather than focusing on the product. The design of the learning tasks should facilitate diverse processes and accommodate various orientations to meet each group's goal. To that aim, it is recommended to provide complex (I.e., require diverse minds to be solved, real-world situations, imply higher-order skills) and open-ended tasks (i.e., allow diverse solutions to a situation or problem).
- **Individual accountability**: each individual is responsible for their learning and contributions to the group. To this aim, it is important to offer possibilities for initial and continuous self-reflection (e.g., self-questioning, self-assessment test, learning journals[11], one-minute papers[12]). Furthermore, it is recommended that roles and responsibilities be established within groups. This can lead to effective communication and increase the focus on tasks.
- **Ideas exchange:** at the beginning of the collaborative learning activity, set clear expectations for how students should communicate and share ideas (e.g., listen actively, ask questions, and provide constructive feedback to their peers). Facilitate group work by providing prompts or questions for students to discuss, monitoring group progress, and providing feedback or guidance as needed (including elements for improvement and good performances). Using digital whiteboards or brainstorming tools can help to structure and visualise initial approaches to a topic.

[11] A learning journal is a personal record where students regularly document their thoughts, reflections, and learning experiences over time.
[12] A one-minute paper is a quick, informal writing activity where students spend about a minute answering one or two reflective questions.

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ACTION 4. **Promote active, social, and collaborative learning**	o **Negotiation**: a collaborative task needs to be established in an atmosphere of respect for others and consideration of others' views. Groups must make joint decisions about the process and goals, share meanings, and clarify misunderstandings. Provide them spaces (e.g., tutoring sessions or block some slots in class), scaffolding[13] (e.g., models, examples, sentence starters, clear instructions) and feedback to orientate the negotiation process. o **Knowledge building**: encourage students to build on each other's ideas and to work together to develop new insights and solutions. To encourage knowledge-building and discussion, motivate students to ask questions or reflect on the topic. Some examples of transitioning from individual reflection to group discussion include: "What do you think about this idea?", "What evidence do you have to support your evidence?", "How does this relate to what we have learned before?", "How does your idea connect with what your teammate just said?", "Can you build on your classmate's idea?", "Can you provide an example to illustrate your classmate's point?, "Can you summarize what your classmate just said in your own words? Furthermore, asking students to summarise and contrast their ideas (e.g., visual representations) or to write agreements or common viewpoints (e.g., doing minutes of their meetings) can also prompt deeper understanding and knowledge building. o **Planning and monitoring**: in long-lasting collaborative processes (e.g., project-based learning), it is fundamental that teams develop a plan distributing tasks and responsibilities (e.g., reporter, resource manager, recorder, timekeeper) to achieve common goals (consult the "Team regulation and management pattern" to learn more). Digital tools for

[13] Consult Agostini et al. (2023). *Scaffolding in Flexible Learning Environments Public Guidelines and Actions*. 10.13140/RG.2.2.28004.35202

ACTION 4. **Promote active, social, and collaborative learning**	managing teams, such as Trello, can be useful. To ensure effective collaborative processes and learning outcomes, the teacher must set up multiple checkpoints and monitoring moments to assess the progress of the groups. • **Organise Interaction** o Propose **group techniques** where students interact with others (e.g., brainstorming, mind mapping, group discussion, round table, role-play) or incorporate collaborative instructional methods (e.g., project-based learning, case-based learning, problem-based learning, simulation). These techniques and methods can be implemented in physical or virtual spaces. o Grouping students and reducing the interaction into **smaller groups** facilitates student learning and teacher monitoring in big group sessions.

ACTION 5. **Propose the use of digital tools to extend learning**	• **Levels of adoption of technologies** Technology adoption can be divided into three levels: low, medium and high. However, other models are available for integrating technology into education, such as SAMR, TPACK or the RAT models. There are different levels of adoption of technologies:	o At a **low level**, technologies can be used to support teaching and learning by providing a space to upload content and deliver activities (in an LMS) or as a tool to perform a task (e.g., a tool to answer quizzes such as Mentimeter, Socrative, Polleverywhere, or SurveyMonkey). To enhance this level, it is advisable to engage in activities that are timely and have plain instructions. Such activities encourage participation both inside and outside the classroom. These activities are particularly helpful in activating students' previous knowledge. It is recommended that they be proposed at the beginning of a module or session. o At a **medium level**, digital technologies can be used as context for learning (e.g., using a videoconferencing tool such as Teams to prompt a debate). It also includes tools to simplify the process of learning or teaching (e.g., shared document or space for monitoring students' contributions or Artificial Intelligence to search for information) or to promote active learning (e.g., tools for developing interactive presentations such as H5P, Edpuzzle, or Nearpod). Some tools can make learning more meaningful, like professional software (e.g., Autodesk, Wolfram Alpha), simulators (e.g., flight simulators, architecture

ACTION 5. **Propose the use of digital tools to extend learning**		simulators), and virtual and augmented reality (e.g., to explore ancient civilizations or to practice medical processes). Guidelines for interacting with tools, in case they are complex or unknown, are necessary. In some cases, prior preparation is needed. o At a **high level**, digital technologies expand learning by giving opportunities to learn whenever and wherever needed (e.g., by using mobile technologies to learn in the street or at a museum, for instance). Furthermore, at this level, technologies are used to learn differently, break barriers and connect with people or spaces outside the course (e.g., using Twitter to discuss a topic or find topical information). This level is ideal for longer projects that involve group work, are situated and require diverse minds to complete. It is fundamental that digital resources are accessible and mobile-friendly, as well as to provide multimedia resources to support diverse learning styles. Technical support and training should be provided to help students and instructors effectively use mobile devices and digital resources. o The different levels of technology adoption can be combined in a learning context. Implementing strategies that simultaneously address these levels could potentially increase overall engagement and participation.

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Challenges	Solutions
One of the evidenced impacts of the FC is the engagement of students and increased motivation (Prieto et al., 2021). However, such **motivation** may decrease as the flipped process progresses.	Teachers must find ways to continuously motivate students to engage with the FC and help them understand the usefulness of the suggested learning process. One way to support students is by acknowledging and **celebrating their academic achievements** at each stage. Additionally, providing opportunities for students to **solve practical problems** can help them see the relevance of what they are learning for their future profession.
Not all students have equal access to technologies or equal digital competences. You must support all students, whether they are highly skilled or not, in using **digital technologies** to help them get the most out of their learning experience.	Offer **multi-modal formats and diverse technological tools** to ensure every student finds the one that corresponds with his/her learning style and capacity. Follow universal design principles to ensure inclusiveness in using digital technologies.
Sometimes, the adaptations made to resources for **SEND students** are not helpful. In the FC, access to and understanding of resources is crucial. Sometimes, the lack of adequate learning resources for students with SEND, results in the inability of these learners to carry out the same learning activities as students without SEND. Multimedia presentations, presenting information simultaneously through too many media and elements, can overload learners' sensory systems. Furthermore, content is frequently unavailable for SEND students on many educational sites.	Therefore, teachers must define moments to ensure the adaptations to resources meet SEND students' needs. This is where pre-lecture briefing is essential, allowing teachers to **diagnose** their **learners' needs**. This will also inform the choices of instructional resources to deploy and the format of pre-class engagement to present to the students. The beauty of FC for SEND students is that it offers lessons flexibility and pacing that other methods might not give. Pre-class diagnostic assessment and diverse instructional resources will be game-changers.

Challenges	Solutions
SEND students may encounter incompatibilities in the learning management system, electronic resources, and assistive technologies.	It is crucial to provide them with the necessary **adaptations** to resources and course **instructions** to ensure equal access to education.
The FC is time-consuming for both teachers and students. Generating ad-hoc resources, monitoring students and increasing **feedback** can generate work overload.	This is where collaboration and team forming are necessary. Teachers can resort to **group leadership, peer review, and assessment to manage the primary feedback stage and** reduce the workload at the initial stage. Furthermore, **procedures and digital tools** can be agreed on by both the teacher and the students to adjust them to students' capacities and needs.
Some students with SEND can have extreme **difficulty learning online**, which can isolate them and, in some cases, even make it difficult for them to complete their education.	Providing **accessible materials, assistive technology, accommodations, and frequent communication** can mitigate isolation situations.
In the case of hybrid sessions, **cognitive load** in students and teachers might appear.	Providing **pre-session materials, simplifying the use of digital tools, providing feedback, eliminating distractions or repeating key concepts** might help reduce cognitive load.
Changing modalities (online and face-to-face) can provoke feelings of **anxiety** in some students with SEND.	Therefore, providing **advance notices** of any changes in the modality of instruction, offering orientation sessions and providing clear instructions might help.
Not all students are **motivated** to do out-of-class activities and consult resources.	This challenge can be solved by employing the **division of learning and task distribution techniques.** Each student can be assigned a component of content and asked to explore it before the classroom in anticipation of presenting or solving a problem in the larger group.

Challenges	Solutions
In highly self-regulation processes like the FC, it is usual to reinforce those students with fewer **self-regulation skills** and give less support to those more skilled.	Teachers must **attend** to all students **equally** to give them opportunities to progress in their learning whatever their level of self-regulation is.
Students might mislead the request for peer **feedback** with evaluation. It must be made clear that giving and receiving feedback is part of the learning process and is different from evaluating (which is a teacher's responsibility). The more students practice feedback exchange, the more abilities students will develop in feedback processes.	Therefore, teachers must design the FC to ensure **recurrent** moments for **feedback** exchange. 360-degree feedback[14] could be a guide for maximising learning improvement.
Flipping teaching and learning needs to be learned. The role of the teacher and the students change, as well as the responsibilities.	Proficiency in teaching and learning in a flipped context is gained through **time and repetition**. The FC works better at higher educational levels and with students and teachers who have previously experienced it (Aydin & Demirer, 2016).
Not everything can and must be **flipped**.	FC works better with **small groups** of students (about 25) and in **practical contexts**. FC is one of the most appropriate methods for achieving these 1st skills. Adopt it to develop critical thinking, collaborative learning, global awareness, communication or digital literacy.
Electronic resources are key in FC.	All **formats** of resources (e.g., written, video, audio, audiovisual, visual) must be generated with **quality**.
Students with low **self-regulation skills** can be disadvantaged in front of students with high	To that end, generating a **team culture of mutual help and role distribution** can benefit all students. Furthermore, providing guidance and support

[14] This method involves collecting feedback from multiple sources—peers, instructors or IA given —to offer a comprehensive view of an individual's academic performance, professional behaviors,

self-regulation skills in an FC context.	and encouraging self-reflection and feedback might reduce inequalities.

Challenges	**Solutions**
University students are not used to being active and planning their **autonomous time**. They may react negatively to the demand for preparation and self-regulation.	The collaboration and engagement part of FC is something every student looks out for during learning periods. **Playful methods** can also be adopted to spark learners' interest while positive reinforcement should be adopted. The **needs and individuality** of learners should also be considered in preparing an FC so that every student is included.
Using **digital technologies** may negatively impact students with special needs or low digital competences.	Some tips for dealing with that challenge are to provide **training and support** to students with low digital competences, ensure that all digital **resources** used are **accessible** to students with special needs, **personalise learning** by offering alternative assignments and assessments, and foster a **supportive environment** that encourages students to seek help and collaborate with peers.

Examples and/or related patterns

- **Related patterns**
  - Self-regulation and prior preparation in online flipped classrooms.
  - Team regulation and management in blended flipped classrooms.
  - Enhancing constructive feedback exchange and self-regulation in the face-to-face flipped classroom.

- **Related references**

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