Flipped classroom

Definition

The flipped classroom is an educational approach that reverses the traditional lecture and homework elements of a course, where students are first presented with course material in advance, and class time is used for active learning exercises.

Overall Development and implementation

Step 1: Determining content and learning outcomes to identify what material should be addressed before class and during class.

> Note: In a flipped classroom approach, the content that should be addressed during class is typically focused on higher levels of learner cognitive work, such as application and analysis.

Step 2: Selecting appropriate educational and assessment methods to ensure effective learning and evaluation of student progress.

Structure of a flipped classroom session: practical recommendations

1)PRE-CLASS activities (**time based on material and task)** refers to the learning tasks and materials that students engage with before coming to class (asynchronous).

- designed to support lower levels of learner cognitive work, such as knowledge and comprehension.
- provide students with foundational knowledge and understanding of the course material so that they can actively participate and apply their knowledge/skills during in-class activities.
- Material should be relevant, experience-level appropriate, and provided well in advance of the in-class activity.
- Clarify expectations for pre-class activities (may have a mandatory completion or submission), communicate explicit links between pre-class and in class activities, and the assessment.

Examples of pre-class activities:

- reading assignments
- SLMs (self-learning modules)
- watching videos
- completing quizzes or worksheets
- engaging in online discussions or forums
- Solve Online quizzes

- Answer reflective questions
- Write a paragraph summary about a specific concept
- Post and share reflections on the online discussion board
- Develop concept maps/diagrams of key points

◊ **NOTE 1**: Based on the task and time available, the instructor has the option to review pre-class activities completed by the students before the in-class session. This can serve to identify issues or concepts that need in class-discussion and clarification. The instructor may decide, based on common misconceptions detected in the pre-class activities, that a specific concept needs further clarification, additional practice, or explanation. Students could also be asked to prepare questions, based on the pre-class material, they like to discuss with the teacher in class.

POINT OF ATTENTION: in the setting of flipped classroom students' preparedness for class cannot be overstated. Therefore, it is critical that the learning occurring in pre-class activities is intentionally and clearly connected to the in-class activities. This will help reduce the risk of students coming to the in-class session unprepared, which is one of the pitfalls of the flipped classroom approach.
In order to hold students accountable for pre-class preparation, here are some strategies:

- Make pre-class activities/assignments mandatory (for completion). Pre-class assignments completion can be assessed electronically (submitted on time/received /not received)
- Clarify that the pre-class material will be discussed in class and that the lack of preparation will prevent students from actively and meaningfully participating in the in-class discussion, hindering full understanding of the material.

Peer assessment may be used. If in class activities involve group work, peers may be best suited to assess the pre-class preparation of their colleagues.

2) IN-CLASS activities - students can engage in activities that require them to apply the knowledge they have gained from pre-class activities, work through problems, and participate in discussions.

- designed to facilitate increased educator-student interaction, allowing students to receive support, clarification, and real-time feedback from educators.

Some examples of in-class activities include the following (preferably no >90 min):

- Problem-solving exercises: Students work on solving complex problems related to the course material, applying the knowledge they gained from pre-class activities.
- Group discussions: Students engage in discussions with their peers, sharing their perspectives, and analyzing different aspects of the subject matter.

- Case studies: Students analyze real-life scenarios or case studies, applying their knowledge to understand and propose solutions.

- Student presentations: students in groups present their answers (rationale) to pre-class problem-solving exercises. Teacher provides feedback and explains key, relevant topics and concepts.
- Quizzes: clicker audience response questions with feedback.
- Mini presentations: teacher engages students and facilitates their understanding of complex topics with a 1–3-minute presentation of key concepts.
- Other (see below figures)

3) Assessment in the context of flipped classroom (in/post class)

Assessment may occur:

- as part of the in-class activities (quizzes, debates, group presentations)
- or can happen after class (written tests such as MCQ-based exams or problem-solving, group projects).

◊ **NOTE 2**: At this stage of the new UCF curriculum design, the flipped classroom will be used mainly as a learning activity with assessment for learning and feedback. At this time, we have not planned for assessments occurring within or in close proximity to the flipped classroom learning activity (e.g. during or immediately after FC) to be part of the final course grade. This may hinder students' ability to perceive the alignment between FC content and current assessments. At a minimum, instructors should clearly communicate assessment expectations and explaining how content is going to be assessed (MCQ, problem solving in TBL, peer assessment)

The role of the teacher and timing

- Develop session objectives in alignment with course objectives.
- Select pre-class activities (where appropriate can use preexisting material from previous curriculum)
- Develop activities for the in-class sessions that are linked to the content, objectives and topics of pre-class sessions. [virtual, synchronous or asynchronous, not facilitated by teacher]
- Facilitate discussion, provide explanations, and clarification on relevant topics using any of the strategies above mentioned.

Example (once a week also based on other teaching /assessment activities)
Day 1 **Asynchronous and faculty not present** (virtual) Students work on their own time. One or more clinical reasoning exercises are assigned to be completed by students before class.

These can be delivered electronically. This material should be interactive to enhance students' motivation to complete it (embed study questions or short summaries or else). Pre-class activities may be mandatory (for completion /not for accuracy) to ensure that students complete the pre-class activities. OPTION: Faculty may decide to review the students' work before in class session if they want to identify topics or concepts (for example misconceptions about a topic found in the majority of the class) they plan to clarify in the in-class session. (See note 1)
Day 2: **Synchronous and faculty present**: (in person)
In class session: the flow of the session can be organized in various ways as long as pre and in class material are discussed and relevant concepts are clarified. The goal is to maximize the time for students/faculty interaction
Option 1: students can work in small groups, then briefly present. Teacher can provide feedback and teaching points based on the brief students' presentations
Options 2: students (large groups) come to the session with specific questions about the pre-class material and the teacher can address them, providing feedback and clarification
Example from M3 intersessions: two sessions of 2 hours each (60 students per session), split in 6 groups, each group briefly present one clinical reasoning exercise while the teacher facilitates the Q and A and provides explanations for key topics and relevant concepts.

References

J, Moffett. (2015). Twelve tips for “flipping” the classroom. Medical Teacher, doi: 10.3109/0142159X.2014.943710

McLaughlin JE, Roth MT, Glatt DM, et al. The Flipped Classroom: A Course Redesign to Foster Learning and Engagement in a Health Professions School. *Academic Medicine. Feb 2014;89(2):236-243.*

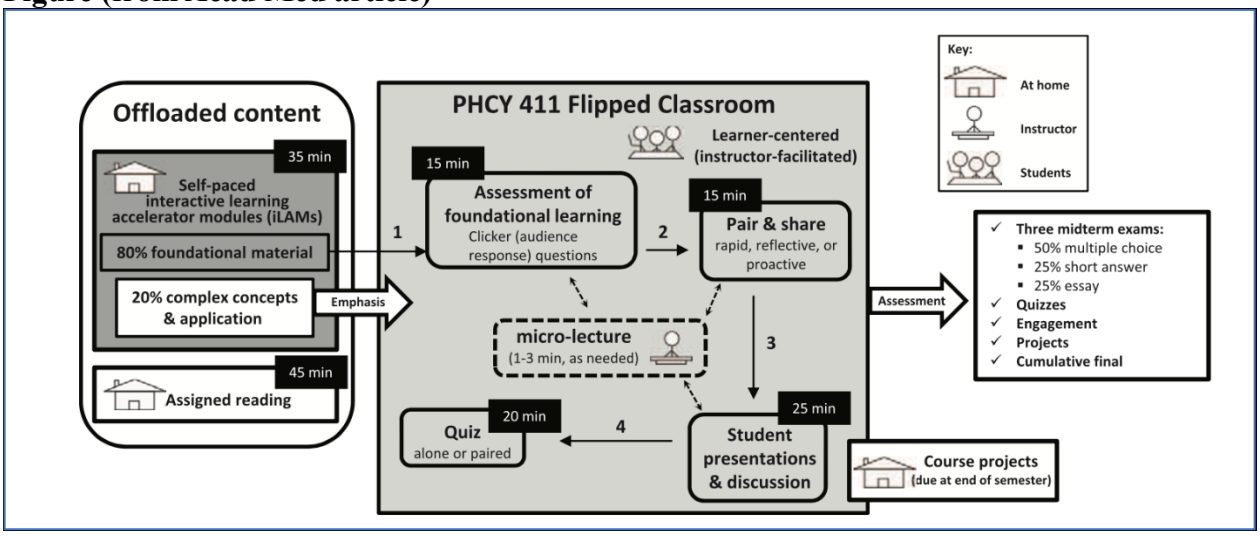
Moraros, J., Islam, A., Yu, S., Banow, R., & Schindelka, B. (2015). Flipping for success: evaluating the effectiveness of a novel teaching approach in a graduate level setting. *BMC medical education*, *15*(1), 1.

Chen, F., Lui, A.M. and Martinelli, S.M., 2017. A systematic review of the effectiveness of flipped classrooms in medical education. *Medical education*, *51*(6), pp.585-597.

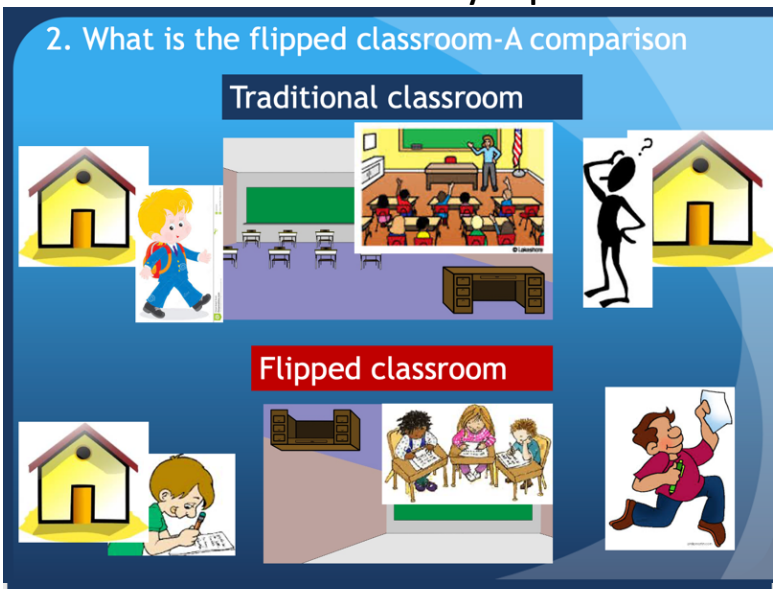
Hurtubise, L., Hall, E., Sheridan, L. and Han, H., 2015. The flipped classroom in medical education: engaging students to build competency. *Journal of Medical Education and Curricular Development*, *2*, pp.JMECD-S23895.

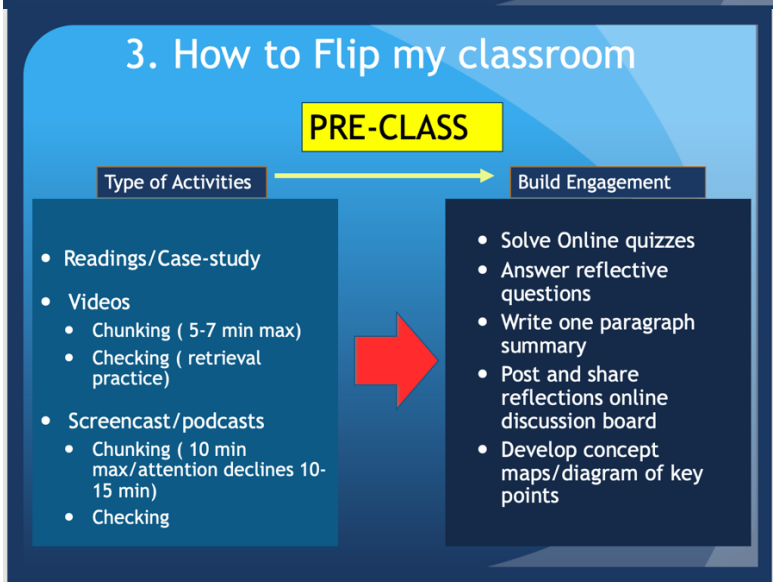
Brief video describing the FC(3 minutes)
https://www.youtube.com/watch?v=qdKzSq_t8k8

Figure (from Acad Med article)



Here are additional visuals that may help better understand the process:

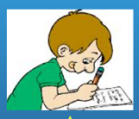




3. How to flip my classroom

IN-CLASS

Individual and/or group activities → Build Engagement



- Quizzes
- Concept maps/diagram of key points
- Role play
- Simulations
- Debates
- Just in time teaching(JiTT)
- Collaborative learning
  - Discussions
  - Think/pair/share
  - 3 step interview
  - Problem solving
  - Case study
  - Group presentations

4. Assessment of the FC

timing → strategies

Pre class

In class

After class

- Written tests
- Observational assessment
  - Teacher/Peer assessment
- Performance assessment
  - Review and assessment of problem solving skills
- JiTT(Just in Time teaching)
- Concept maps/diagram of key points/puzzles/games

5. JiTT –Just in Time Teaching

Just in time teaching: strategy for more active learning during class time

Pre-class

1. **Select an out of class assignment** for students - The assignment can be reading text, watching a video , listening to a podcast
2. **Embed Assessment** - ask students 3 questions about the assignment-students must include the reasoning for their responses.
3. **Review assignment before class** - review students' responses to the 3 questions

In-class

4. **Address areas of students' difficulty or misunderstanding during class time** - can use peer Instruction or any other strategy .

J. Shell. How to evaluate students' effort on out-of-class work in a flipped class, 2013 https://blog.peerinstruction.net/2013/02/19/how-to-evaluate-students-effort-on-out-of-class-work-in-a-flipped-class/ accessed on 1/6/16