



Flipped Classroom Instructional Models

Department of international Cooperation for

Medical Education

2022.07.20

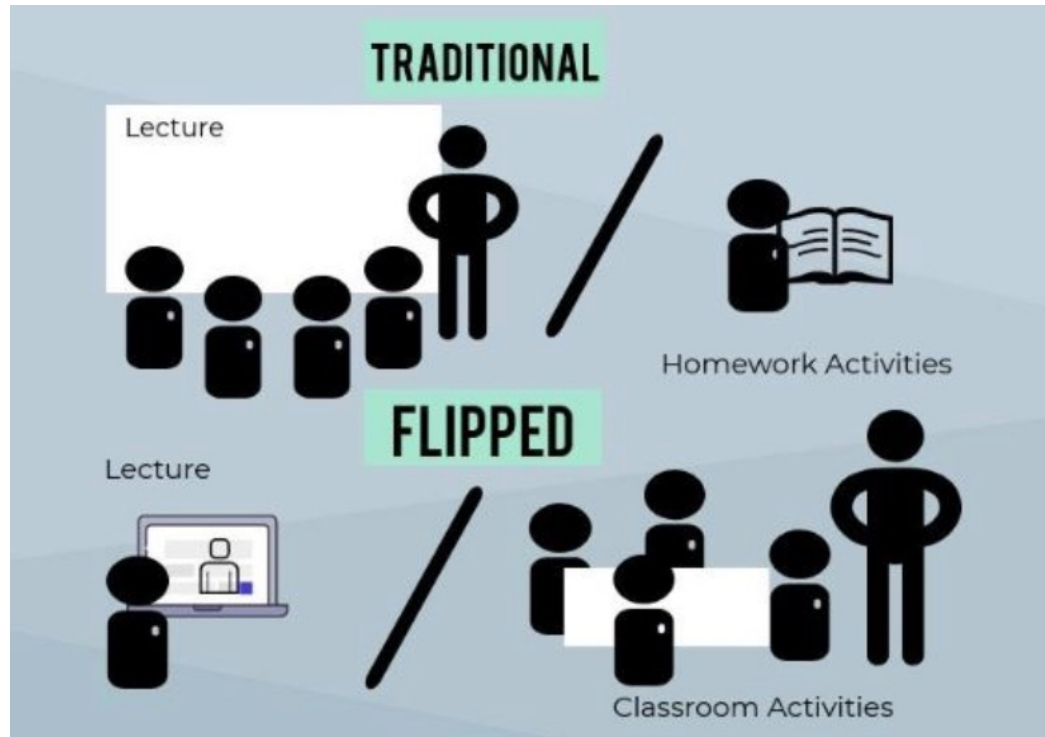
Wu Han

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The flipped or inverted classroom is a new and popular instructional model, in which activities traditionally conducted in the classroom (e.g., content presentation) become home activities, and activities normally constituting homework become classroom activities.



- Flipped classrooms are centered around the students – not the teacher.
- Student-centered learning embodies a set of theories that include: active learning, peer-assisted learning, and collaborative learning.

Active learning



“any instructional method that engages students in the learning process”

Peer-assisted learning



“the acquisition of knowledge and skills through active helping and supporting among status equals or matched companions”

Collaborative learning



“ a situation in which learners interact in a collaborative way ”

In-class activities in flipped classrooms.

Categories	<i>f</i>	%	Sample research
Discussion	27	38.03	Kiviniemi (2014)
Small group activities	22	30.99	Al-Zahrani (2015)
Feedback	20	28.17	Kong (2014)
Problem solving	20	28.17	Khanova et al. (2015)
Questions and answers	12	16.90	Galway et al. (2014)
Group discussions	9	12.68	González-Gómez et al. (2016)
Collaborative group work	8	11.27	Eichler and Peeples (2016)
Case studies	8	11.27	Jeong, González-Gómez, and Cañada-Cañada (2016)
Hands-on experiments	8	11.27	Battaglia and Kaya (2015)
Quizzes	7	9.86	Zainuddin and Attaran (2016)
Students' presentations	5	7.04	McLaughlin et al. (2013)
Audience responses (Clicker)	3	4.23	Khanova et al. (2015)
Assignments with teacher assistance	3	4.23	Nguyen et al. (2016)
Gaming	2	2.82	Battaglia and Kaya (2015)
Micro lectures	2	2.82	Khanova et al. (2015)
Group projects	1	1.41	McLean, Attardi, Faden, and Goldszmidt (2016)
Writing	1	1.41	Zawilinski et al. (2016)
Guest speakers	1	1.41	McLean et al. (2016)
Word cloud	1	1.41	Porcaro et al. (2016)
Concept mapping	1	1.41	Porcaro et al. (2016)
Brain storming	1	1.41	Kong (2014)

- Discussion
- Small group activities
- Feedback
- Problem solving
- Questions and answers

Table 4
Out-of-class activities in flipped classrooms.

Categories	<i>f</i>	%	Sample research
Videos	56	78.87	Teo et al. (2014)
Readings	35	49.30	Kiviniemi (2014)
Quizzes	30	42.25	Wanner and Palmer (2015)
Discussion	8	11.27	Weaver and Sturtevant (2015)
PowerPoint presentations	3	4.23	Howitt and Pegrum (2015)
Homework	3	4.23	Smith (2013)
Reflection	2	2.82	Sage and Sele (2015)
Online modules	2	2.82	McLean et al. (2016)
Web Quest	2	2.82	Hung (2015)
Further research	1	1.41	Nguyen et al. (2016)
Audio lectures	1	1.41	Bösner et al. (2015)
Interactive tutorials	1	1.41	Eichler and Peeples (2016)

- Videos
- Readings
- Quizzes

Six inductive categories were created for the advantages :

- learner outcomes
- pedagogical contributions
- dispositions
- interaction
- time efficiency
- other

learner outcomes

One of the most significant advantages of this model is that it helps to improve learning performance, which is one of the key elements of quality education.

learner outcomes

Inductive categories	Sub-categories
Learner Outcomes	Improves learning performance Satisfaction Engagement Motivation Increases knowledge Improves critical thinking skills Feeling more confident Promotes creativity Focus on Problem solving skills Better retention Improves application skills Improves ICT skills

- ❑ Also the flipped model also enhances student satisfaction (18%) and their level of engagement.
- ❑ Advantages such as enhancing confidence, promoting creativity, and increasing problem solving skills were reported by a few researchers.

pedagogical contributions

Pedagogical Contributions

Flexible learning
Enables individualized learning
Enhances enjoyment
Better preparation before class
Fosters autonomy
Offers collaboration opportunities
Enables more feedback
Fosters higher self-efficacy
Provides peer-based learning
Increases study effort
Supports interest in the course
Improves attendance
Suitable for large group teaching
Decreases withdrawals

- ❑ The most prominent pedagogical contribution of the flipped classroom is its flexibility
- ❑ Can pause, rewind, and review lectures using technology
- ❑ Enabling individualized learning and enhancing student enjoyment of the lectures

Dispositions, interaction, time efficiency & other

Time Efficiency	More efficient class time More time for practice
Dispositions	Positive feedback from students Positive perceptions (students) Positive attitudes Positive perceptions (teachers)
Interaction	Interaction (Students-Instructor) Interaction (General) Interaction (Students-Students)
Other	Less anxiety Cost effective Students adapt quickly

- ❑ Students had positive perceptions towards flipped classrooms
- ❑ Increases in students-instructor interaction
- ❑ Ability to use class time more efficiently

The most commonly reported problem is students' limited preparation before class time. If a student does not take time to study at home, s/he may not perform well in the classroom activities, and this may diminish the advantages of the flipped classroom.

From the students' perspective

the flipped model requires more time and work:

- This model prompts students to preview the learning materials for better in-class participation
- some of the students acquired passive learning habits from the traditional classroom, where learning requires less time and work
- a relatively new approach, can cause problems such as anxiety, adoption problems, and resistance to change.

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From the teachers' perspective

might require more time and workload:

- Pre-recording video lectures and preparing other flipped model materials is time consuming for teachers.
- The actual time needed to prepare flipped course materials can be nearly six times more than traditional course preparation

RESEARCH ARTICLE

Open Access

A novel integration of online and flipped classroom instructional models in public health higher education

Lindsay P Galway^{1*}, Kitty K Corbett^{1,2}, Timothy K Takaro¹, Kate Tairyan¹ and Erica Frank³

Table 3 Descriptive statistics of post-course survey items focusing on learning experience and perceptions

Survey item	Agree/strongly agree (%)	Disagree/strongly disagree (%)	Neutral (%)
I was comfortable with self-directed learning through NextGenU.	100	0	0
The online learning materials contributed to my learning.	100	0	0
I completed the activities and learning materials before in-class sessions.	100	0	0
The quizzes encouraged completion of the online learning materials.	82	0	18
In-class learning activities complemented online self-directed learning.	100	0	0
The reflective responses contributed to my learning.	91	0	9
Interaction with my instructor and other classmates contributed to my learning.	100	0	0
The flipped classroom model (online learning plus in-person classroom interaction and problem-solving) was a different learning experience than other MPH courses.	100	0	0
The flipped classroom model enabled more interaction with my instructor and classmates than did other MPH courses.	82	0	18
In the future, I would rather take a 'flipped' course (blended online learning plus in-persons classroom interaction and problem-solving) than a traditional (lecture-based) course.	82	9	9

NB: Students were asked to react to statements on a 5-point Likert scale where 1 = "Strongly disagree" and 5 = "Strongly agree." For reporting of these survey items, agreement (strongly agree and agree) and disagreement (strongly disagree and disagree) were combined.

This instructional model should be considered for more widespread experimentation in the context of public health higher education and beyond.

flipping' the classroom is not simply about shifting lectures outside of the classroom. 'Flipping' the classroom involves seeing students as active learners, shifting control of both learning and the classroom from the instructor to the students; it should promote a focus on higher-order cognitive work.

more research is needed to understand the role of reflection in the flipped classroom instructional model.

THANK YOU !