MALO:
A web-based application for collaborative learning outside of class in a flipped learning course

The Challenge

Our project is an institution-based joint research project in which researchers in Japan have explored ways of designing, implementing, and sustaining active participation in collaborative learning both in class and outside of class within a flipped learning approach to blended learning. This project dealt with the following four urgent challenges:

1. The need to clarify blended learning for specific teaching situations,
2. The development of an effective integration of online and offline elements,
3. The transformation of a student culture with very little outside-of-class independent study, and
4. The creation of a student-centered active learning classroom environment.

The Solution

Definitions of flipped learning and blended learning

Flipped learning is defined as a form of blended learning that uses a web-based application to integrate e-mentor-facilitated collaborative learning tasks outside of class for students in groups of four or five with in-class teacher-mediated small-group collaborative learning activities.

Development of a conceptual diagram of a flipped learning lesson
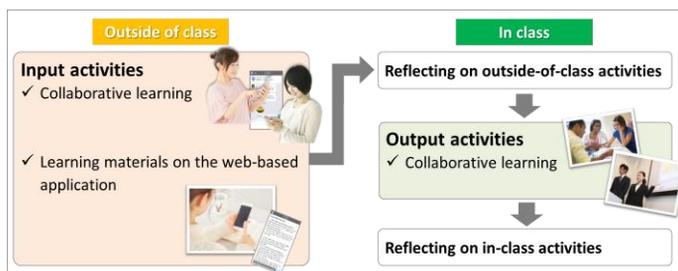
This figure shows a conceptual diagram of a flipped learning lesson. The teacher sustained the motivation levels necessary for ongoing engagement in input learning tasks outside of class by sending supportive e-mentoring messages to address the students' specific needs, facilitate interpersonal communication, develop cognitive strategies, and reduce anxiety. In class, after the students had reflected on their outside-of-class activities, they collaborated in small groups on output learning tasks that the teacher facilitated. They also reflected on their in-class activities.

Development of the web-based application: MALO

This figure is a diagram of a MALO learning environment on the smartphones of the students and teacher.
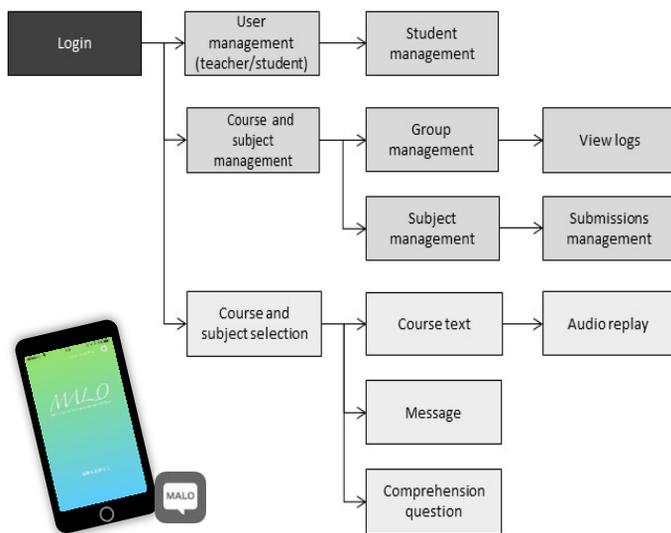
Creation of a flipped learning course design

The MALO flipped learning course consists of four-session units, one session per week.

Session 1

Outside of class, students engage in small-group collaborative learning tasks by reading a course text and answering a reading comprehension test to ensure that they have understood the text. In class, students collaborate in groups to write a summary of the text, brainstorm key topics and select a Session 4 presentation topic.

Session 2

Outside of class, on MALO, students share and exchange opinions on their research findings and start creating a presentation outline. In class, the students collaborate in groups to finalize their presentation outline and draft slide shows.

Session 3

Outside of class, students engage in collaborative learning to revise their slide shows and write scripts. In class, the students collaborate on finalizing the slide-shows and on revising the scripts.

Session 4

Outside of class, students practice their presentations in pairs. They upload video clips on MALO and evaluate their delivery. In class, the students in their groups use the slide-shows to present their research findings and hold discussions.
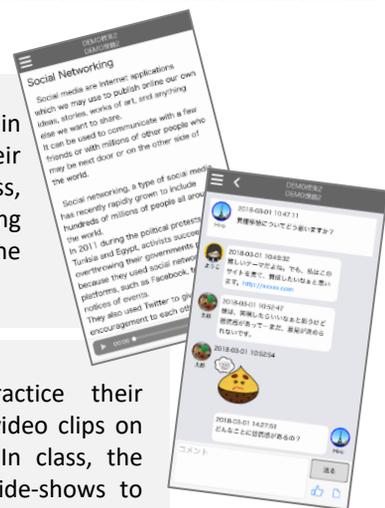
The Learning Impact Outcomes

The Learning Impact Outcome 1

This table shows the Pearson's product-moment correlation coefficient for students' teaching, social, and cognitive presences as derived from the results of the Community of Inquiry Survey Instrument, which was conducted as a post-course questionnaire. It was found that MALO supported student collaboration outside of class.

	Teaching presence	Social presence	Cognitive presence
Teaching presence	—		
Social presence	.48*	—	
Cognitive presence	.69**	.59**	—

n = 24

$^*p < .05, ^{**}p < .01$

The Learning Impact Outcome 2

Pre- and post-questionnaires that measured the quality of students' active learning showed that the difference between the results of the post-questionnaire and the pre-questionnaire was statistically significant. Active participation in collaboration contributed to the integration of online and in-class learning tasks.

$p < .01, r = .86$

Pre test
Post test

n = 24
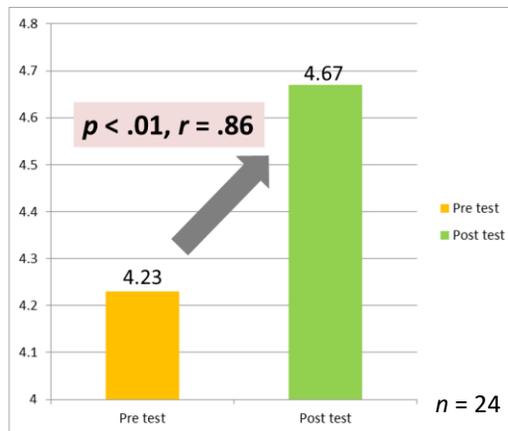
6 point Likert scale: from 1: I strongly disagree to 6: I strongly agree

The Learning Impact Outcome 3

The results of the post-course evaluations consisted of two parts: Part I, which included outside-of-class learning tasks, and Part II, which was about in-class learning tasks. These results revealed that the students actively participated in both in-class and outside-of-class activities.

Part	Item	Mean (SD)
Part I Outside of class	1. The reading text was interesting.	4.53 (1.07)
	2. I looked for at least one related text each unit using the search engines.	5.37 (0.68)
	3. I **actively** worked on understanding the reading texts, and preparing a presentation.	**5.11 (0.57)**
	4. I **actively** had a discussion with the other members of the group in understanding the reading text, and preparing a presentation.	**4.53 (1.02)**
	5. Chunking the reading text was useful for understanding the text.	3.89 (0.88)
	6. The comprehension test was useful for understanding the reading text.	3.63 (0.90)
	7. The advice sent by the teacher was useful for understanding the reading texts, and preparing a presentation.	4.95 (0.97)
	8. The encouragement sent by the teacher was useful for understanding the reading texts, and preparing a presentation.	4.89 (0.88)
Part II In class	1. The reflection on the outside-of-class activities was useful for the following in-class group work.	4.32 (0.82)
	2. The reflection on the in-class activities was useful for the following outside-of-class activities.	4.26 (0.45)
	3. I **actively** worked on preparing a presentation.	**4.79 (0.92)**
	4. I looked for at least one related text each unit using the search engines.	5.42 (0.69)
	5. I **actively** had a discussion with the other members of the group in preparing a presentation.	**4.68 (1.00)**
	6. The discussion with the other members of the group was interesting.	4.53 (1.07)
	7. I **actively** worked on making a presentation.	**4.74 (0.73)**
	8. The presentation was interesting.	4.63 (1.12)
	9. The teacher's advice and encouragement were useful for having a discussion with the other members of the group.	5.05 (0.71)
	10. The teacher's advice and encouragement were useful for preparing a presentation.	5.05 (0.91)

n = 21

6 point Likert scale: from 1: I strongly disagree to 6: I strongly agree