Enhancing student learning: Exploring the potential of flipped classrooms

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Student engagement and learning

Interaction with materials
Interaction with instructor
Interaction with peers
a. Pre-class homework (watch video presentations, readings, case studies)
b. Student accountability (quiz, test, or pre-class essays)
c. Class activity (in-class discussions, problem solving activities, case studies)
d. (Guided) Post-class reflection homework (Post-class essay)
e. Testing (multiple choice quantitative tests, homework essays, open ended question in final exam)
f. Lecture

Studying before final
Methods

Output (grades) study: 68% response rate
• Class A: 53 students; 33 participated
• Class B: 51 students; 30 participated
• Class C: 33 students; 23 participated

Questionnaire (self-perceived engagement) study: 63% response rate, and student interviews (4)
• Class A and Class B: 65 participated

End-of-course evaluations, mid-term evaluation of course/instructor (external reviewer), team debriefings, focus groups (external reviewer), instructor observations
<table>
<thead>
<tr>
<th>Lesson Name</th>
<th>Class A</th>
<th>Class B</th>
<th>Class C</th>
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<tbody>
<tr>
<td>Videos</td>
<td>a, e Video</td>
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<td>Quantitative quiz</td>
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<tr>
<td>Case study</td>
<td>c, e Class activity</td>
<td>f, e Lecture</td>
<td>a, b, c, d, e Pre-class case study, Accountability essay, Class activity, Post-class reflection</td>
<td>Open-ended question in final exam</td>
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<td>Agricultural Sustainability lesson</td>
<td>a, c, e Pre-class recorded lesson Class Activity</td>
<td>f, e Lecture</td>
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Lesson Name | Class A | Class B | Testing
---|---|---|---
Videos | a, e Video | a, e Video | Quantitative quiz
Agriculture in Sub-Saharan Africa lesson | a, b, c, e Pre-class recorded lesson & quiz Class Activity | f, e Lecture | Homework essay
Gender issues lesson | f, e Lecture | a, b, c, e Pre-class recorded lesson & quiz Class Activity | Homework essay

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Questionnaires

- 4-page, 30 min questionnaire (20 open-ended questions)
  - Self-perceived impact on learning and engagement of different teaching strategies
  - Questions on pre-class work
  - Promoting student engagement and learning
  - Impact
Key findings/recommendations

1. Students participating in the flipped lessons with pre-class assignments, accountability measures, and in-class activities, showed more active learning, and demonstrated better (content acquisition) and higher order learning skills in the final exam questions for these lessons;

2. Most useful and impactful pre-class assignment accountability measures were those including creative questions (rather than just content questions);

3. Students resisted change, and struggled to accept additional pre-class assignments;

4. Student resistance to work in teams is a threat to the success of a flipped classroom, and should be addressed throughout the semester;

5. Instructor flexibility, while important in the flipped classroom, is met with wariness by students; and

6. To best benefit from the flipped classroom, students first need to learn lesson dynamics and processes, so consistency is key.
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Studying before final