

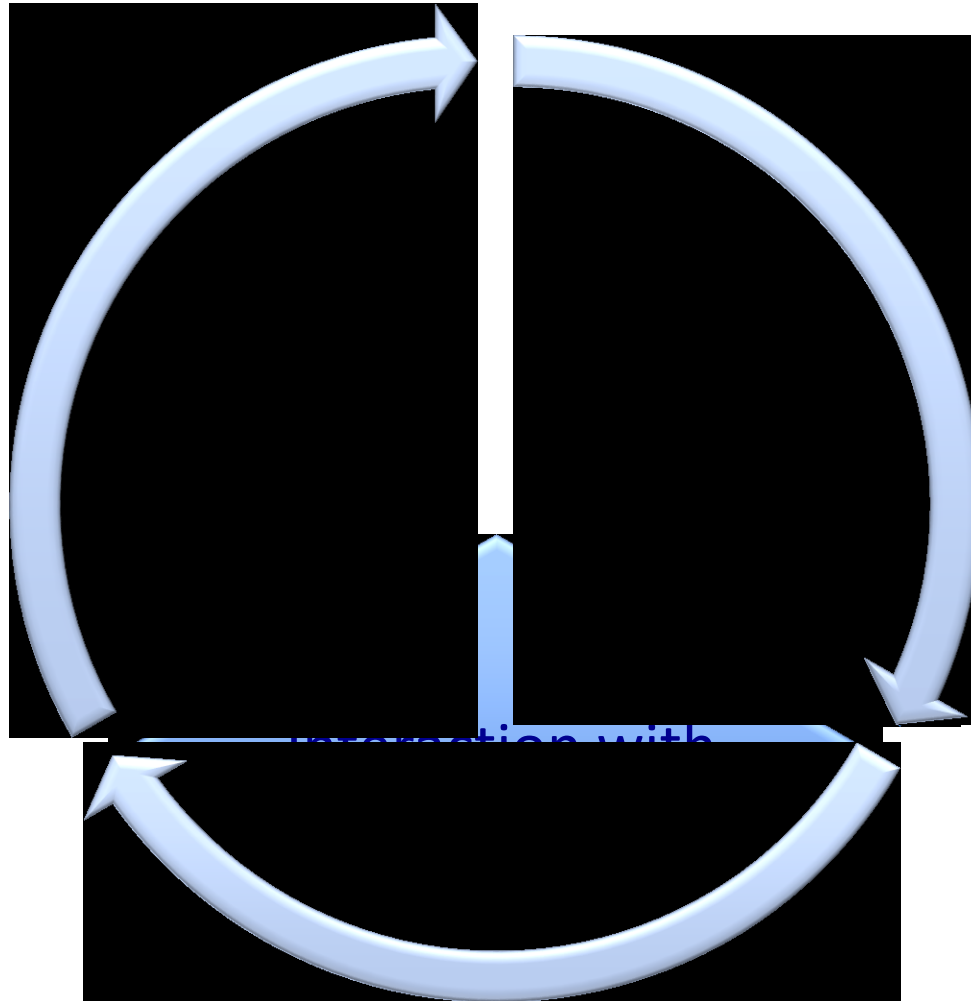
Enhancing student learning: Exploring the potential of flipped classrooms

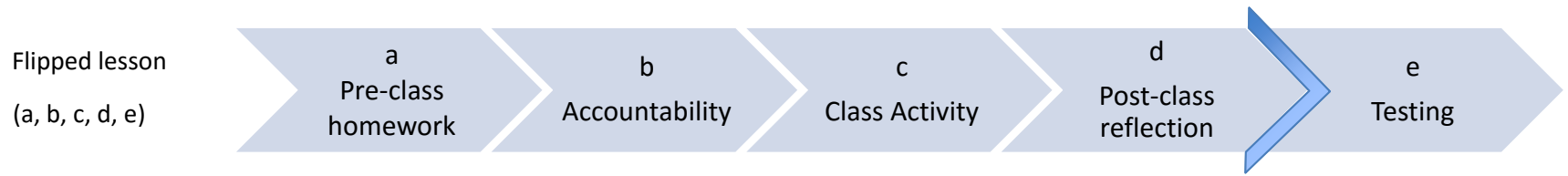
Maria Navarro

Christopher Campbell

Rachel Wigington

Student engagement and learning





- 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

Lesson Name	Class A	Class B	Class C	Testing
Videos	a, Video	a, Video	a, Video	Quantitative quiz
Case study	c, Class activity	f, Lecture	a, b, c, d, e, Pre-class case study, Accountability essay, Class activity, Post-class reflection	Open-ended question in final exam

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Lesson Name	Class A	Class B	Testing
Videos	a, e Video	a, e Video	Quantitative quiz
Agricultural Sustainability lesson	a, c, e Pre-class recorded lesson Class Activity	f, e Lecture	Homework essay
Health lesson	f, e Lecture	a, c, e Pre-class recorded lesson Class Activity	Homework essay

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 - f. Lecture

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

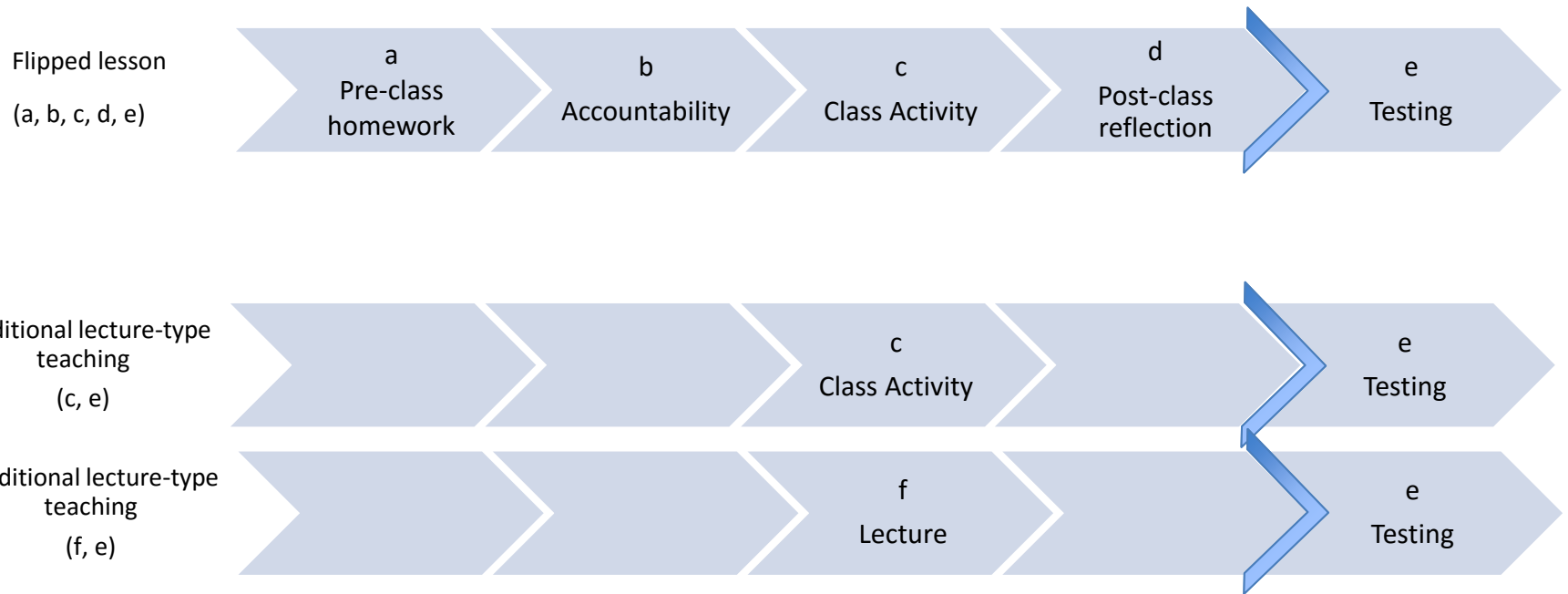
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Questionnaires

- 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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