

The Effects of "Lesson Study" Concept on the Online Engineering Course Delivery

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Background

- Study shows that the online enrollments have been growing substantially faster than overall higher education enrollments.
- There were more than 5.8 million students took at least one online course in year 2016.
- One of the challenge for delivering online courses is that instructors may not easily switch some of the pedagogies used in face-to-face courses to online teaching. This research project is focused on applying lesson study in the online delivery course.



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Lesson Study

- Lesson Study is first developed by teachers from Japan to track students' learning outcomes and use the results to enhance the course delivery effectiveness.
- Lesson study activities follow the Plan – Do – Check – Act continues improvement cycle.
- In the Lesson Study project, teachers celebratedly observing a series of lessons, discuss the evidences during their observation and come up with improvement plans.
- Lesson study project benefits both instructor and students.



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Lesson Study

- Lesson Study is effectively used in many face-to-face delivery courses.
- To use Lesson Study for online delivery courses, the instructors need to overcome the following challenges:
 - It is hard to “observe” the online students learning process.
 - Online students learning are not “synchronized”, there is no such a “time period” that students will work together.
 - The evidence that shows students learning progress are hard to “record”.
 - ...



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Project Background

This research project applies the Lesson Study pedagogy in an engineering technology online course. The project intends to achieve three outcomes:

- Find a way to apply the Lesson Study pedagogy in online teaching.
- Develop a Learning Progress Tracking System (LPTS) that can help team members observe students learning outcomes in the online environment.
- As the results of Lesson Study, enhance the online students' learning and critical thinking skills.



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Create Course Work

Course: Project Management – Online Delivery
Study Outcome Goal:

1. Apply project resource planning approach to schedule/level project resources.
2. Use MS Project software as the tool for resource scheduling.
3. Optimize resource scheduling.



Learning Progress Tracking System (LPTS) Development

Platform: D2L discussion board

- Students were asked to post their ongoing work (MS Project Plan files) to the discussion board (group based) or shared drive – this allows the observers to check the progress. The key is to ensure the instructors are able to see the “Progress”.



Learning Progress Tracking System (LPTS) Development

Progress Checkpoints:

- The instructor worked together to create a series of Checkpoints such as the MS Project software options setting, initial resource schedule, calendar setting, resource substitution/level policy...



Learning Progress Tracking System (LPTS) Development

Evidence Collection:

- Students were asked to post their comments to each group member's work and use the group discussion to come up with solutions on how to optimize the resource schedule.



Learning Progress Tracking System (LPTS) Development

Sample Outcome



Learning Progress Tracking System (LPTS) Development

Instructors group discussion based on the evidences from the observations.



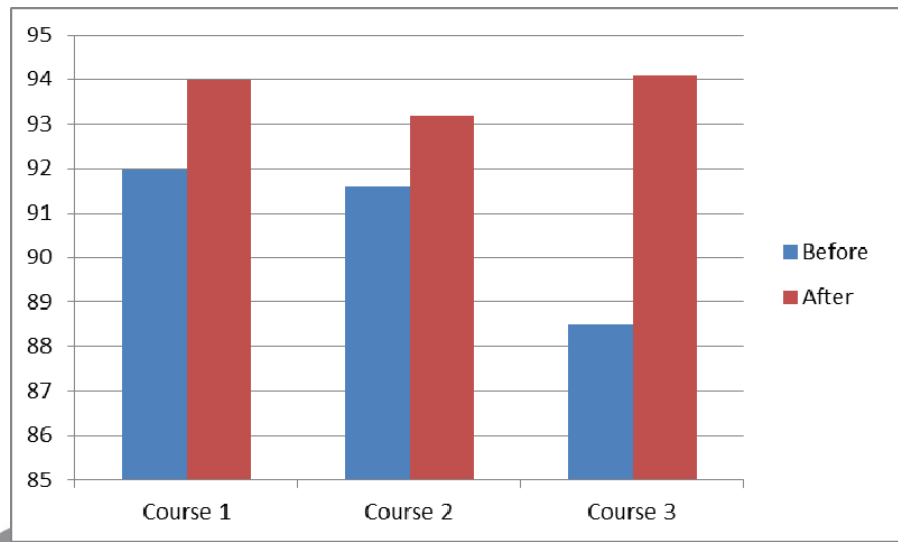
Students' Learning Outcome

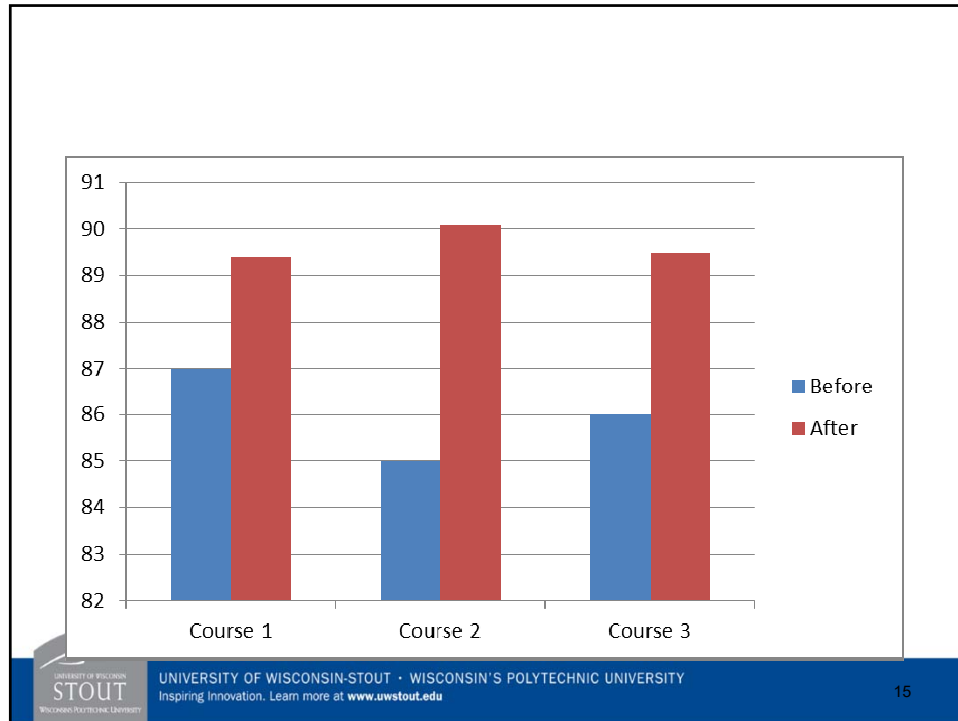
Surveys

A survey is given to the students to investigate their experience with virtual modeling.

Analysis of student work

Student performance and their progress were evaluated.





Summary

The LPTS works well but needs some modifications.

1. The observation cycle is much longer than the regular face-to-face lesson study.
2. Checkpoints need to be defined in the course work requirements.
3. Motivation for online students.