

Flipping Without Flipping Out!

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Liberal Arts Math courses are rich with problems that allow students to apply mathematics to the real world. Participants will be taken through a typical week in a flipped classroom with applications in finance. The presentation will provide ideas on how flip without flipping out.

Goals/Outcomes:

Participants will learn how the flipped model looks in practice as it is implemented in a typical week in a liberal arts math course. Participants will see a demonstration of how technology is used to enhance the flipped model and receive activities to use in their classroom during a unit on finance. Participants may want to bring a TI-graphing calculator to use in the activities presented.

Technology Needs:

This presentation will require internet as well as projection for a computer and iPad.

Flipped Learning – What is it?

In a traditional mathematics classroom the instructor lectures during a 50-minute period attempting to introduce, practice and expand on the topic. The students are dismissed from the classroom often times without having the opportunity to digest the concepts presented. The student is then expected to complete problems and acquire a deeper understanding of the material at home. Many students will give up when they are faced with a difficult problem and may even start to second-guess what they think they know.

Many educators, including ourselves have looked for ways to have students go deeper into the mathematics they are learning in order to create the mathematical habits such as those listed in the Standards for Mathematical Practice in Common Core State Standards in Mathematics (CCSSI, 2012)

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

A flipped classroom allows for these types of mathematical practices.

“Ultimately, flipped learning is not about flipping the 'when and where' instruction is delivered; it's about flipping the attention away from the teacher and toward the learner.” (Sebolt, 2012)

Typical Cycle

Maricopa Community Colleges in Arizona offer a course (MAT 142 – College Mathematics) that is intended to meet the core mathematics requirement for non-science majors by introducing them to common mathematics they might encounter in everyday living. The flipped model is ideal for the liberal arts math course; we are able to discuss the relevance of the math because we are not spending our time on terms and the basic understanding of the concepts.

Prior to class students watch short example videos. They watch the videos, take notes, and generate any questions they still don't understand. These questions are either emailed to the instructor or brought into class for clarification. These questions allow for a much richer discussion in class.

During class the instructor will look over the questions that the students have generated and clarify any confusion. The instructor now has the possibility of doing mastery learning, inquiry or active learning, project based learning (PBL), challenge based learning (CBL) or any other variety of teaching philosophies that allow students to go deeper into the material. In our class, students work on any of the following:

- A challenge problem that will have several steps and the students will have to work together to answer the questions.
- A mini research session, where the students research and answer the questions using the most recent data available.
- Students could work together to solve problems similar to their homework.
- Extended Projects

The classroom time is spent on furthering the students understanding of the topic rather than teaching them how to calculate the math. In the case where remediation is necessary, the instructor is able to have one-on-one conversations with students who may be struggling. When the students come to class with a basic understanding of the initial concepts, the instructor can spend the time connecting the relevance and showing how math can empower the student in their decision- making outside the classroom.

This presentation will take participants through a typical cycle in a finance unit with materials provided to take back and use in practice.

References

Common Core State Standards Initiative. (2012). Common Core State Standards in Mathematics – Standards for Mathematical Practice. Retrieved February 19, 2013 from <http://www.corestandards.org/Math/Practice>

Sebolt, M. (May 31, 2012). The Truth about Flipped Learning. Retrieved July 18, 2013 from <https://sites.google.com/a/salem.k12.va.us/flipped/stories/thetruthaboutflippedlearning>