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Active Learning and Transparency in Teaching Gateway Mathematics Courses

Viktoria Savatorova
University of Nevada, Las Vegas, viktoria.savatorova@unlv.edu

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Active Learning and Transparency in Teaching Gateway Mathematics Courses

Viktoria Savatorova, Mathematics, College of Science

The practice and the need it addresses	Evidence this practice benefits UNLV Students	Resources and where to find them	How other UNLV teachers might adopt this practice

Teaching and learning practices: active learning and transparency

The need: we concentrate our attention on the gateway courses (for example, PreCalculus) which have had traditionally low passing scores and retention.

Objectives: in our teaching practice we aim to be consistent assuring
- Active participation in the class work based on understanding the concepts and ability to implement them;
- Clear understanding of the requirements and the grading system (what should be done, when it needs to be done, and how to do that?)

Activities:

In class participation activities
Here's my example: come up with a problem similar to the solved in class, solve the new problem; check the answer.
Question of the day: solve *a* short revision question; check, see if you need to revise
*Grade your work (before the test activity)***:** solve the review, grade your work using instructor's rubrics;
Learn from mistakes (after the test/quiz activity): practice missed questions;
After the class activities:
 Talk to your instructor **:** homework related questions and discussions;
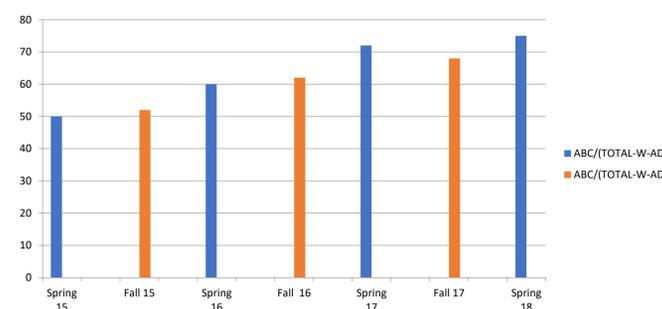 *Getting ready for the test:* solve the *extended review,* submit your solutions, get the feedback.

Benefits for UNLV students

The most important thing is the fact that students overcome their fears of being unsuccessful in the class, become more confident and motivated.

Students indicated that they started to enjoy doing mathematics after they saw that they can succeed.

As a result, more students are now able to pass these gateway courses in their first attempt and are no longer stalled in their progress towards completion of their degree.

Success rate comparison (Math 127):

Resources for students:

Transparency (WebCampus)
- Alerts and Announcements (current assignments, due dates, study sessions, in class standing, etc.)
- Lecture Notes and Videos;
- Bank of Review Questions (for each chapter, and for each test);
- Grades (all the scores are posted)
- **Active Learning (WebCampus)**
- Discussions (discuss course related questions with your classmates and instructor);
- Messenger (a "talk to your instructor" tool to ask a question and/or get a feedback)

Online homework system (WebAssign)
Help Sessions before mid term exams: group study sessions offered by the instructor (the classroom is reserved)

Resources for faculty:

- **Canvas Instructor Guide**
https://community.canvaslms.com/docs/DOC-10460-canvas-instructor-guide-table-of-contents#jive_content_id_Discussions
- **Burger, Edward B. and Michael Starbird, The 5 Elements of Effective Thinking, Princeton University Press, 2012.**
- **Benjamin Braun. et al. (2014,2015) Active learning in Mathematics, Part I,II The challenge of defining active learning &) Levels of Cognitive Demand.**
http://blogs.ams.org/matheducation

Ways to use our practices:

Our teaching practices are universal and can be easily implemented across the disciplines. The instructor can determine what will work better for the specific course.

We would suggest the following steps:

☐ **Getting started :**
o "Let's get acquainted" activity (to get to know students; to clarify responsibilities and expectations);
o "Do you know how to ..." (the 1ˢᵗ WebCampus discussion aimed to initiate communication between students) ;
o Early intervention (who is at risk ?)

☐ **On a daily basis:**
 We are all in this together
o Encourage students to use the course related materials (lecture notes, videos, study guides posted on WebCampus);
o Initiate and facilitate student's communication with their peers and instructor (group work, WebCampus discussions , messages);
o "Learning by doing" (practice in class problem solving in groups or individually);
o Student's progress monitoring;

☐ **Getting ready for the test:**
 I show the way, you do the walking
o "Practice Makes Perfect": study guide as an extended review;
o In class review: solve the problem, grade your work using the instructor's rubrics;