REPLACING LECTURE WITH ONLINE VIDEO TUTORIALS

THE GEOLOGICAL SOCIETY OF AMERICA®
SCIENCE • STEWARDSHIP • SERVICE

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1. CITY COLLEGE OF SAN FRANCISCO

City College of San Francisco is a two-year college.

Most of our students are general-education students looking to fulfill a natural science requirement for transfer to a 4-year college.
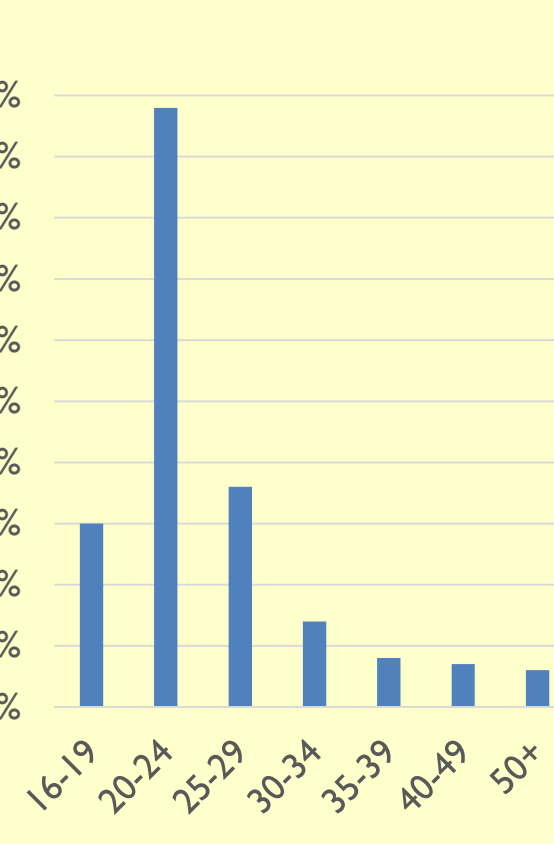
Earth Science Student Average Success Rate *(passing class with C or higher):* **57%**

Earth Science Student Gender **male = female**

Earth Science Student **Ethnic Background**
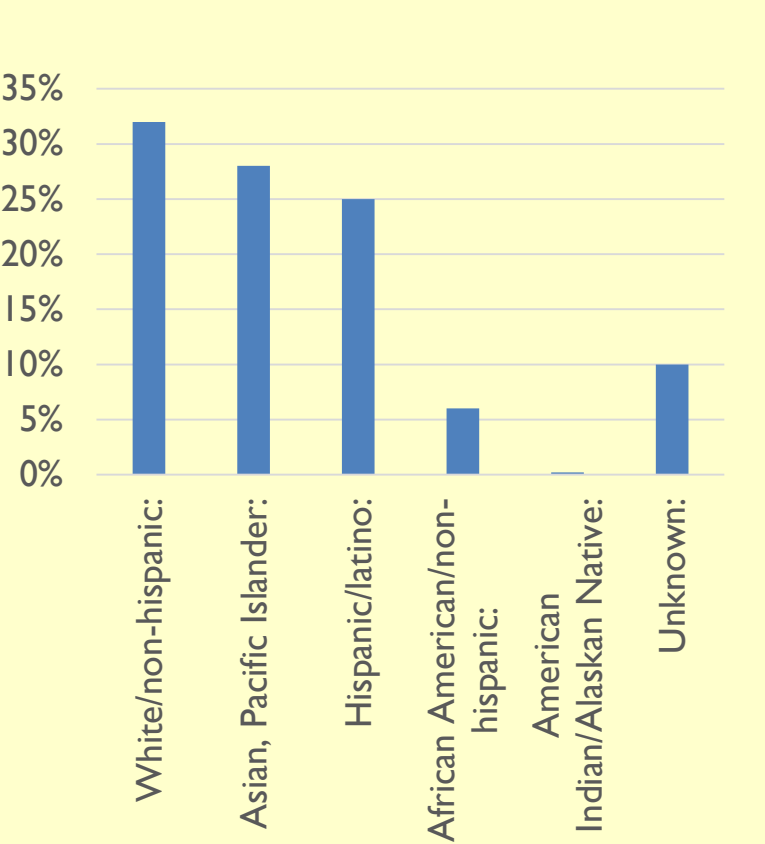
Earth Science Student **Age**

2. OCEANOGRAPHY

Introductory-level general-education science class covering physical, chemical, geological, and biological oceanography.

Class details:
- 3-unit lecture *(optional lab)*
- Two 75-minute class meetings/week

Class size: 25 to 50 students

Student access:
- Use the **class website** to access and watch weekly video tutorials, access links to and complete weekly quizzes, and review supplemental web resources.
- Use the **Oceanography 1 Workbook** to review images, data, text, and tables from weekly video tutorials, and access weekly worksheets (based on videos), concept sketches, and other activity sheets completed in class.
- Use **class time** to turn in and review completed weekly worksheets and concept sketches, engage in class discussion, and engage in class group activities.

Screenshot of class website

First page of 250-page class workbook

Classroom during worksheet review.

5. DATA AND IMPACTS

- Students come to class **better prepared**
- **Higher energy** and **more insightful discussions** in the classroom (*classroom is LOUDER, and desks are more askew*).
- **More student engagement**
- **More critical thinking in class** (*less writing down, word-for-word, lecture notes*).
- **Improved catch-up and review opportunities** for students outside of class.
- **Greater student satisfaction** on weekly evaluations *(online and in class)* .
- More **relaxed and enthused instructor** in the classroom. *Everything we do there is bonus!*
- More harried instructor out of the classroom because of all the time spent making videos.

Quantitative impacts:
- **Increased classroom interaction** among instructor and students. Pre-flip: ~20% class time | Post-flip: ~90% class time.
- **Increased average exam scores** (*based on standardized student learning outcomes exam*): Pre-flip: 56% | Post-flip: 69%
- **Fewer discipline problems**. (*Students who don't want to put in the time drop quickly.*) Pre-flip: 2-4 incidents/class | Post-flip: 0
- **Increased class attendance**. Pre-flip: later semester drops off to ~40-60% Post-flip: stays solid all semester at ~90-95%

3. REPLACING LECTURE WITH VIDEO

When? Since Fall 2012. I am now in my 5th semester of using this new format.

Why? Sheer frustration that my students were not coming to class prepared *(not reading the textbook).*

How? *All videos I use to replace my lecture are videos I produced.*
I created videos originally based on my PowerPoint™ slides and then expanded as I picked up additional technological expertise.
- **Tools:** Camera, Tripod, Camtasia Studio™, PowerPoint,™ Adobe Photoshop™, Adobe Illustrator™, and Audacity™.
- **Process:**
  1. Write a script *(imagining myself in the front of a classroom with access to all materials I'd want; this script later becomes my closed-captioning and a resource for students).*
  2. Use Audacity™ to record script narration *(adding in sound effects where appropriate).*
  3. Gather all media I envisioned when creating script *(scientific illustrations, maps, screenshots, video of class demonstrations, video of live Earth processes: either public domain, Creative Commons, or self-produced).*
  4. Use Camtasia Studio™ to combine all elements, and add in embedded quizzes, animations, and closed captioning.
  5. Produce as a .mp4 and a flash-wrapped .html both published to my class website so students can access.
  6. Edit continually to improve quality and eLearning: segment into shorter modules *(5-10 minutes where appropriate)*, replace copyrighted material *(so available to be shared publicly)*, and reduce cognitive load.

Videos are developed to incorporate typical lecture components: graphics, images, text call outs, field footage, music, interactive quizzes, demonstrations, animations, and more...Above image by Katryn Wiese and Matt Lao (www.mattlao.com).

Primary resources I used for designing video:
- **Podcast Solutions: The Complete Guide to Audio and Video Podcasting**, Michael W. Geoghegan and Dan Klass.
- **e-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning**, Ruth Colvin Clark and Richard E. Mayer. 3rd edition. (2011)
- Collaborations with colleagues: http://serc.carleton.edu/NAGTWorkshops/video/design.html

Primary esources I use to get good images and video:
- USGS, NOAA, NASA, NPS – government website (Public Domain)
- Flikr Creative Commons (imges)
- Wikimedia (Creative Commons)
- Self produced (Adobe Illustrator™)

4. HOW DOES IT WORK?

1. **Video tutorials** are assigned as required pre-class homework.
2. Videos are accompanied by a **multi-page worksheet**, and an **online quiz**, both of which must be **completed prior to the first class meeting each week**. *(These ensure tutorials are watched, considered critically, and applied to problem solving prior to class.)*
3. In class, in groups of 3 or 4, students **discuss completed worksheet answers and compare with answer key**.
4. For the second class meeting, students bring and **discuss completed concept sketches** in small and large groups.
5. The rest of class time consists of hands-on demos, activities, and group discussion.

http://fog.ccsf.edu/~kwiese/content/Classes/oceanography.html