Undergraduate Educator Network Webinar Series

Sponsored by
Undergraduate Education Subcommittee
SOT Education Committee

June 23, 2014
3:00 PM ET

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Welcome

Mindy Reynolds, PhD
Chair, Undergraduate Subcommittee
Washington College

Joshua Gray, PhD
Chair, Webinar Series
US Coast Guard Academy

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The Use of Technology to Teach Toxicology and Related Disciplines

Angela Slitt, PhD
Speaker
University of Rhode Island

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Speakers

Christine Curran, PhD
Northern Kentucky University

Emily Notch, PhD
Dartmouth Medical School
Western New England University
The Use of Technology to Teach Toxicology and Related Disciplines

Webinar Objectives

• Describe use of technological tools to enhance instruction

• Increase use of student-centered learning strategies

• Specifically, the use of
  o Twitter
  o Student response systems
Use of Twitter® for Teaching Toxicology

Angela Slitt, PhD
Associate Professor

Department of Biomedical and Pharmaceutical Sciences
University of Rhode Island
URI Grand Challenges Program

University of Rhode Island Initiative to reinvigorate general education courses

Goals

• To supplement general education/courses on global issues
• Enrich first-year experience/interdisciplinary seminars
• Attract full-time and senior faculty instructors
URI GCH103: Toxic or Not?

• Undergraduate general education course developed in response to the Grand Challenges program.

• Course title: Toxic or Not? Topics are toxicology and public health themed, with relevance to common exposures and exposures of interest to young adults.

• 20-25 Freshman per class. Typically have to be higher achieving students based on high school performance. Class is meant to be challenging, engaging, and allow student to enter conversation in the area of environmental health.
URI GCH103: Toxic or Not?

COURSE DESCRIPTION

This course will provide basic knowledge regarding commonly known environmental chemicals, how they impact human health, and socioeconomic and global issues associated with environmental chemical exposure.
LEARNING OBJECTIVES

• To provide basic information about chemicals that humans are exposed to on a daily basis. We will discuss the what, where, and who of environmental chemicals – what they are, where they are found, and what populations are exposed.

• To educate students about how to find credible information regarding chemical exposure and toxicities using the internet and world wide web sources. Learning how to use proper information sources through journals and the web can help students know the facts instead of misconceptions.

• To teach students how to understand and interpret data as presented in a graph or tabular format.
Freshman: The Good, the OK, and the Lazy

Opportunities teaching freshman
- No expectations and open to learning new things
- “Tech savvy”
- Plugged into social media
- More willing to work in “teams”

Challenges teaching freshman
- Adjusting to new environment and independence
- Diverse backgrounds in secondary education preparation
- Maturity level
- Attention span
- Boys + dorms = video game playing for hours and poor class attendance

Neutral issues teaching freshman
- Tend to be more connected with parents
Goal: To engage students in learning

Problem
I wanted to be more engaged with students and provide a classroom setting that was interactive, social, and gave students the opportunity to share learning with their community.

Solution
Social Media? Could it work?

Hence the Twitter Project was born....
@Toxic_uri

Toxic or Not?
@Toxic_uri
Dr. Angela Stitt. Toxic or Not? Follow our class as we learn about what is toxic to us and the environment. #GCH 103 #URI

Kingston, RI

17 Photos and videos

Tweets

Tweet 1:
Toxic or Not? @Toxic_uri - Apr 15
Toxicology research is intended to identify harmful effects of potential new products and to determine safe levels for approved products #AM

Tweet 2:
Toxic or Not? @Toxic_uri - Apr 15
Do you enjoy chemistry and biology? As a science, toxicology is at the interface between chemistry and biology! #AM

Tweet 3:
Toxic or Not? @Toxic_uri - Apr 15
Your first Tuesday, one of the first known examples of the ancient...
@Toxic_uri

Project Description:
To create a successful Twitter account with followers that will tweet about interesting facts and ideas learned in class that could be useful to their bigger community.

Project purpose:
The purpose of the project is to engage the entire class by using social media to convey useful information and ideas related to toxicology and environmental health to the greater community.

Student Learning Outcome:
Better learn facts/concepts learned in class through use of “retelling” to others
Core elements of Class Twitter Project

1. Class gets divided into teams of 3-4 students (team names are after a chemical we will talk about – dioxin, DDT, lead)

2. Teams will tweet from the class Twitter account based on information learned in class through lecture, reading, assignments, movies, and presentations.
   - Each team will tweet at least once per week.
   - When your team tweets, end the tweet with a hashtag and your team name. Example tweet: “Some of our most toxic poisons come from nature #TeamBPA”
Core elements of Class Twitter Project

3. Teams can work independently or with other teams to get followers for the class account. The goal for the class will be 500 followers. However, you will get extra credit for getting a high “impact” follower.

1 high impact follower = 5 followers.

You will have to give Dr. Slitt the follower name so we can double check it. Example – David Dooley, president of URI, is a “high impact” follower.

There are so many different ways to get all different types of followers.
Core elements of Class Twitter Project

4. Teams can use of more traditional means to advertise the twitter account.

5. Retweets – if your team can locate 10 re-tweets related to their work, they can get a free pass for 1 class.
Twitter Project Grading

1. Goal of >500 Followers
2. Tweets must be on time
3. <150 Followers – Final Exam that covers entire class material will be administered
4. <300 Followers – Final exam that covers only material discussed after the midterm
5. 301-500 Followers – Choice: Take a grade of B+ for final exam grade or take a final exam that covers only material discussed after the midterm.
6. >500 Followers – No final exam, Grade of A given for final exam
Twitter Site

Toxic or Not?
@Toxic_url
Dr. Angela Slitt. Toxic or Not? Follow our class as we learn about what is toxic to us and the environment. #GCI1_103 #URI
Kingston, RI

Toxic or Not? @Toxic_url · Apr 15
Toxicology research is intended to identify harmful effects of potential new products and to determine safe levels for approved products #AM

Details

Toxic or Not? @Toxic_url · Apr 15
Do you enjoy chemistry and biology? As a science, toxicology is at the interface between chemistry and biology! #AM

Details

Go to full profile
Example Class Tweets

**Toxic or Not? @Toxic_uri Apr 15**
Do you enjoy chemistry and biology? As a science, toxicology is at the interface between chemistry and biology! #AM

E-waste equals 70% of overall toxic waste. Lead in electronics causes damage to the nervous systems, blood and kidneys. Recycle properly! #KC

**Toxic or Not? @Toxic_uri · Dec 13**
Did you know children in homes with vinyl flooring are in danger? Vinyl flooring can emit phthalates which increases the risk of autism. #JC

**Kyle @_KyleMcIlmail · Nov 21**
Glad to see that the @Toxic_uri twitter page is still up and running. It was great being part of the class that started it last year.

Ricin is a poison found naturally in castor beans. If castor beans are chewed and swallowed, the released ricin can cause injury #TeamRicin
Example Class Tweets

“Chinese workers will risk their lives for hazardous materials in electronics for $8 a day, #astonishing.”

Toxic or Not? @Toxic_uri · 25 Nov 2012
The "Boomerang" effect- we dump all our chemical waste into the ocean and years later it comes back with a vengeance #oops #RachelConboy

Toxic or Not? @Toxic_uri · 16 Nov 2012
Years after banning DDT and the bald eagle population increasing, Eagle says thank you #TeamAsbestos

Toxic or Not? @Toxic_uri 16 Nov 2012
Being exposed to DDT as a male increases your feminism.... #watchout
‘Toxic or not?’ URI freshmen gain answers, share information on Twitter

KINGSTON, R.I. – January 23, 2013 – Hazards from exposure to pesticides, mercury, and lead and whether bottled spring water is free of contaminants regularly make headlines around the world.

But in Angela Slitt’s class, “Toxic or Not?” a University of Rhode Island Grand Challenges offering from last semester, the professor did more than just rely on compelling subject matter to engage her students. She required all of them to Tweet about what they learn and draw others to the Twittersphere to join them in the conversation.

The class satisfies a general education science requirement. Provost Donald H. DeHayes, who wanted freshmen to be stimulated by courses that focus on critical societal issues, launched the Grand Challenges courses two years ago.

Slitt, an assistant professor in the College of Pharmacy, organized the 24 students into eight teams and they competed to be tops in gaining followers and Twitter activity. They had to decide among themselves which Tweets they would send. They also chose their own somewhat foreboding team names, including Team DDT, Team Dioxin and Team Mercury. The students were all non-science majors from every college at URI. The Tweets are fun, informal, a little irreverent and always informative.

Here are a few:
• “If you use Teflon near your bird, be ready to say, ‘Bye, Bye Birdie.’”
• “Chinese workers will risk their lives for hazardous materials in electronics for $3 a day. #astonishing.’
• “Ever thought of mixing bleach and ammonia to really keep the house clean, well DON’T because this will release toxic vapors.”
• “Years after banning DDT and the bald eagle population increasing, Eagle says thank you.”

“We have 168 followers,” Slitt said. “The students get extra credit for high impact followers.”
Class Outcomes

TWEET THE TRUTH. #TOXICORNOT

Social media is a way of life for college students—especially for the freshmen in Professor Angela Slitt's “Toxic or Not?” course. Students in the class not only discover the toxins that lurk among us, they also have to spread the word—on Twitter—about what they learn.

Associate Professor of Pharmacy Angela Slitt, a toxicologist by training, created the popular “Toxic or Not?” class as a Grand
### Twitter Project Survey Data

<table>
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<th>Questions*</th>
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<td>5. Having the Twitter project replace a midterm examination grade would have improved the course</td>
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* 15 questions were administered in the survey but question 15 was excluded from analysis since response rate was low (3 out of 16). It was open-ended requiring the students to give feedback on the likes and dislikes of the project.

** Responses were graded from 1 to 5. 1 – Strongly disagree, 2 – Somewhat disagree, 3 – Agree, 4 – Somewhat agree, 5 – Strongly disagree.
The Twitter Project Survey suggests majority of students agreed (>50% agreement) that the use of twitter teams improved the following:

**Interpersonal connection**
- Interaction with classmates (Q 1)
- Interaction with professor (Q 13)

**Learning & Engagement**
- Challenged and motivated the students to actively learn, participate, review and discuss class notes, topics and ideas learned in class (Q 3, 4, 8)
- Practical application and relevance of the course (Q 9)

**Knowledge sharing**
- Platform to share ideas relevant to others (Q 10)

**Grading methods and outcomes**
- Preference to final examination as a grading component (Q 2). Possibly the project created a less stressful and tense approach to learning and performance assessment.
Findings

The survey revealed that 62.5% of the students did not have prior experience receiving formal instruction and learning with social media. Another 62.5% indicated they preferred having the mid-term examination retained alongside the twitter project but not as a replacement.

The improvement areas noted above may be related to recommendations from the survey that:

• Twitter usage should be incorporated into formal education on health and environment to improve student engagement.
• Twitter project for this particular course should be continued in the future classes.
• Assessment of students on an individual basis may be required to increase full participation of team members.
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Distribution of responses for each category

- Strongly disagree
- Somewhat disagree
- Agree
- Somewhat agree
- Strongly agree

Distribution of responses for each category graph:

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Conclusions

**Pros**
- Interactive
- Allows students to share college experiences with their network (i.e., parents, siblings, friends)
- Opportunity to apply knowledge
- Great way for instructor to gauge excitement about class and topics, learn about students
- Could be coupled with a marketing/communications course

**Cons**
- Slacking team members dampen morale for motivated students (solution: maybe give teammates the ability to “fire” member)
- Fun, but not challenging

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Rapid Response Systems: From High-Tech to No-Tech

Chris Curran
Department of Biological Sciences
Northern Kentucky University
Are there any questions?

Source: http://bringingaba.blogspot.com/2012/02/bring-aba-into-inclusive-classrooms.html

Northern Kentucky University
Advantages of Active Learning

- Increased satisfaction
- Improved academic performance
- More effective instruction
- More timely interventions
- Better for the student
- Better for the instructor
The “clickers”

- Personal response systems
- Tied in with PowerPoint slides
- Allows instructor to...
  - take attendance
  - provide extra credit
  - deliver pop quizzes
  - assess comprehension

Source: http://www.turningtechnologies.com
CONTENT: Layers of the Epidermis

- **Stratum basale**
- **Stratum spinosum**
- **Stratum granulosum**
- **Stratum corneum**

**Keratinocytes**

**Dendritic (Langerhans) cell**

**Merkel cell**

**Desmosomes**

**Melanocyte**
Merkel cells are important in...

1. Perceiving pain
2. Perceiving touch
3. Destroying invaders
Dendritic cells are important in...

1. Temperature homeostasis
2. Immune system function
3. Nervous system function
Factors to consider

- Cost of purchasing a clicker
- Risk of using alternative technology (tablet, smartphone, etc.)
- University-wide technical support
- University-wide consistency in technology
Other e-tools

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More e-tools
Inexpensive alternatives

- Colored index cards
- Short writing assignments
  - What did you learn today?
  - What didn’t you understand?
- E-mail response
Questions?
Comments?
Free Polling Software to Engage Students and Assess in Class Group Activities

Emily Notch
Dartmouth Medical School
Western New England University
Goals for This Presentation

• Introduce two free software options for polling

• Uses other than just in class questioning
  o Group reflection
  o Mini quizzes
  o In Vitro Luncheon
Polling Software

• General Polling
  o Great way to engage students
  o Allows students anonymous response

• Other Options
  o Quizzes
  o Homework
  o Post Group Work Reflections
Polling Software

- Socrative
  - www.socrative.com
- Poll Everywhere
  - www.polleverywhere.com

- Free!!!
- No Equipment Required
  - cell phones
  - web enabled device
## Pros and Cons

### Socrative
- No limits on student number
- Doesn’t automatically populate power point
- Both polling and quiz options

### Poll Everywhere
- Free Account up to 40 students
- Graph automatically populates power point
- Only polling, no quiz options
Socrative – Student View

**Multiple Choice**

Room number: 372678

Choose an answer:

- A
- B
- C
- D
- E

**Quick Quiz**

Room number: 372678

Question 1 of 6
Group Members (Including Yourself)

Submit
Socrative – Teacher View

My Room Number: 372678
Students In Room: 0

Single Question Activities
- Multiple Choice
  Ask a MC question, display results
- True/False
  Ask a T/F question, display results
- Short Answer
  Open-ended question, display responses

Quiz-Based Activities
- Start Quiz
  Run a pre-made quiz.
- Exit Ticket
  Get an end-of-class pulse-check
- Space Race
  Run a quiz as game

Tip: Ask a question orally, students answer via Socratic. Learn more

My Room Number: 372678
Votes: 1/1

Bar Chart:
- C: 1 vote
Poll Everywhere – Teacher View

Poll Question:
How often will you use polling in class?

How will my audience respond?
- Open Ended
  Your audience can respond with anything.
- Multiple Choice
- Clickable Image
- Text Wall
  You can set more advanced options later.
- Word Cloud
- Cluster
- Ticker

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What is -in your opinion – the biggest problem in extrapolation of the results of in vivo animal assay towards man?

- Inter and Intra Laboratory Variability: 10%
- Interspecies Differences: 54%
- Acute vs Chronic Exposure: 14%
- Lack of Validation and Standardization: 22%

*Start this poll to accept responses*
Group Reflections

• After POGIL Group Reflections
  o Saves paper
  o Response emailed to you in spreadsheet

• Allows for assessment of activity success
  o Student reflection on outcomes of activity
  o Help revise future activities or groups
My Favorite Group Reflection Questions

• What went well in your group today?
• What didn’t go well in your group?
• Do you think all group members understood the activity?
• Summarize the main point of the activity.
• What did your group have the most trouble understanding today?
### Question 1:
**What went well today in your group?**

**Answer(s):** 
Optional: enter correct answer(s) separated by a comma

**Explanation:** 
Optional

### Question 3 (Short Answer):
**Question:** What didn’t go well in your group?

**Answer(s):** 
Optional: enter correct answer(s) separated by a comma

**Explanation:** 
Optional

### Question 4 (Multiple Choice):
**Question:** Do you think all the group members understand the activity?

- [ ] Answer 1: Yes
- [ ] Answer 2: No
- [ ] Answer 3: I’m not sure
Summary

- Free, readily available polling software options
- Great way to engage students
- Select best one for your class based on your needs
  - Class size
  - Features
General Questions and Concluding Comments
Thank you for participating today!