Teaching in Virtual Environments
APRU Global Health Program at the University of Southern California
in collaboration with
Global STEM Education Program at the University of Oregon

November 12/13
Technology for Remote Teaching
Eleanor Vandegrift, University of Oregon
Julie Clarke, University of Melbourne

December 3/4
Equity and Access in Remote Teaching
Eleanor Vandegrift, University of Oregon
Michael Antonio Mendoza, University of the Philippines Manila

January 21/22
Authentic Online Assessment
Mona Monfared, University of California, Davis
Fung Fun Man, National University of Singapore

More info or to register: apru.org/our-work/pacific-rim-challenges/global-health
Welcome and Introduction

MELLISSA WITHERS,
UNIVERSITY OF SOUTHERN CALIFORNIA

ELLY VANDEGRIFT,
UNIVERSITY OF OREGON
Goals for today:

1. Provide pedagogical, technology, and peer support to faculty across the APRU network teaching remotely.

2. Create opportunities for APRU affiliated faculty to connect and share resources and experiences with creating equitable remote learning environments.

APRU Disclaimer: The views, information, or opinions expressed during the APRU Global Health Working Group Webinars: Teaching in Virtual Environments (Part II) are solely those of the individuals involved and do not necessarily represent those of The Association of Pacific Rim Universities (“APRU”) and its employees. APRU is not responsible and does not verify for accuracy any of the information contained in the series.
Format

20-30 MINUTES EXPERT PANEL

30 MINUTES SMALL GROUP DISCUSSION

30 LARGE GROUP DISCUSSION
Mona Monfared

UNIVERSITY OF CALIFORNIA, DAVIS
Three ideas for online assessment

PUBLIC EXAMS

PARTICIPATION SURVEYS
including exam wrappers

INFOGRAPHIC


Public Exams

60-70% of material
Missing key elements
Posted for students for one week
Students provide feedback

Full Exam Question (Multiple True/False)
For each answer, select True or False.

___ This diagram represent mitosis.
___ This process creates eggs and sperm that are ready for fertilization.
___ In this image, at stage D the cells are identical to the cells at stage A.
___ In this image, the cells at stage D are diploid.
___ In this image at stage C the chromosomes undergo crossing over.
___ In this image at stage B the cell is diploid.

Elly Vandegrift, University of Oregon
Example (questions no image)

___ This diagram represent mitosis.
___ This process creates eggs and sperm that are ready for fertilization.
___ In this image, at stage D the cells are identical to the cells at stage A.
___ In this image, the cells at stage D are diploid.
___ In this image at stage C the chromosomes undergo crossing over.
___ In this image at stage B the cell is diploid.

Elly Vandegrift, University of Oregon
Review the graph at right.

Which of the following passages describes the graph?

A) membrane permeability to urea is only dependent on the amount of membrane cholesterol
B) amount of membrane cholesterol is only dependent on membrane permeability to urea
C) membrane permeability to urea is dependent on temperature and the amount of membrane cholesterol
D) amount of membrane cholesterol and membrane permeability to urea are dependent on one another

Example (figure no questions)

Participation Surveys – formative assessment

Weekly “quiz” that is a combination of different types of questions

- Content questions (fill in the blank, multiple choice, True/False, short answer)
  Example: In your own words, describe the difference between Keq and Q

- Muddiest point/Clearest point
  What was the clearest point about glycolysis? What point still needs clarification?

- Awareness/Use of resources
  Have you attended any of the office hours held by the peer tutors?
Participation Surveys – formative assessment

Weekly "quiz" that is a combination of different types of questions

• Space to provide feedback
  Do you have any questions or comments for me?

• Interests related to the course
  What topics related to metabolism are you interested in?

• Interests not related to the course
  What is your favorite food? What is a movie or TV show that you like so much you have watched it multiple times?
Participation Surveys – formative assessment

Weekly ”quiz” that is a combination of different types of questions

• Reflection
  
  It has been a challenge to shift to remote learning, but every challenge teaches us something. What was an important discovery you made last spring or over the summer about how to succeed in the remote learning environment? (This can be about what worked for you or what didn't work for you – both are useful things to learn about yourself.)

• Exam wrappers
  
  Examples: Which of the following did you do to prepare for the exam? What do you think you will do differently in preparing for the next exam?

Weekly "quiz" that is a combination of different types of questions

- Ask students for input on an assignment and/or rubric

Examples:
We will have an infographic project where you pick an enzyme and you design an infographic about it. The assignment is called "Spotlight on an Enzyme."
I want to get your ideas on what you think should be included in an infographic about an enzyme. For example, structure of the enzyme? what pathway it is a part of? what reaction it catalyzes? etc. **What you write will help me build the instructions for this assignment.**

For the infographic assignment, how do you think it should be graded? What are some of the things you think should be in the rubric? **I will build the rubric from your suggestions.**
Infographic Assignment (group or individual)
Students are asked to create an infographic for a specific audience

Examples from three different Biochemistry classes:
- Spotlight on an Enzyme
- My Favorite Metabolite
- Crowdsourced questions on a general topic from class and give students a curated list to choose from. Some examples were: How does stress affect metabolism? How do cancer cells differ in metabolism from healthy cells?

Ask students what they think should be on the infographic and how it should be graded – create assignment and rubric incorporating their ideas.
Infographic examples
Adapting authentic assessments in the new normal

FUNG FUN MAN, PH.D.
NATIONAL UNIVERSITY OF SINGAPORE
CHEMISTRY & SCIENCE OF LEARNING

@chemfunman
Authentic Assessments

Why is this better?

- Focus on analysis and application
- Help students be future-ready
- Synthesis of knowledge rather than regurgitation
- Maintain integrity
WHY would our grandchildren’s generation think this is strange?
Why would the future generations think this is strange?
NEW Normal?
Current assessment methods during this COVID-19 pandemic

- Online / Home-based Assessments
- Alternative assessment methods
- Postponing / cancelling assessments

Challenges

Time to Reimagine Assessments Methods?
FORMATIVE SUMMATIVE

WHEN THE CHEF TASTES THE SOUP

WHEN THE GUESTS TASTE THE SOUP

FROM STEVE WHEELER’S BLOG “THE AFL TRUTH ABOUT ASSESSMENT”
Novel Assessment Methods

Apply formative assessments to simulate summative assessments (Team-based Learning).

Implementing open-ended questions (with no clear answer).
Novel Assessment Methods

Apply formative assessments to simulate summative assessments (Team-based Learning).
- Using small break out groups to discuss about application of concepts.
- Questions posed to these break-out groups have no clear answers and can simulate the summative assessments questions.

Implementing open-ended questions (with no clear answer).
- Focus on analysis and application of knowledge (Bloom’s Taxonomy).
- Maintain integrity as it is harder to students to duplicate answers.
- Synthesising knowledge rather than regurgitation of knowledge, student’s ability and creative to apply their knowledge.
Novel Assessment Methods

Apply formative assessments to simulate summative assessments (Team-based Learning).

- Using small break out groups to discuss about application of concepts.
- Questions posed to these break-out groups have no clear answers and can simulate the summative assessments questions.

Implementing open-ended questions (with no clear answer).

- Focus on analysis and application of knowledge (Bloom’s Taxonomy)
- Maintain integrity as it is harder to students to duplicate answers
- Synthesising knowledge rather than regurgitation of knowledge. -> tests student’s ability and creative to apply their knowledge.
Novel Assessment Methods

Open-ended real world questions

- Designed to achieve the UNSDG 17 goals
How can we prepare students for these assessments

1. Team-based Learning
2. Small Break-out groups of 4 to 5 students
3. Pose questions to these groups that require thinking and discussion
4. These questions can simulate summative assessment questions
What kind of Open-ended questions?

- Analysis
- Application

Mimic real world problems

FUNG FUN MAN, PHD, NATIONAL UNIVERSITY OF SINGAPORE, 2021
Example 1

Use the data provided in Figure 2 (next page) to respond to the following.

(a) Describe the change in per capita waste generation from the year 2000 to 2010 and explain two probable causes for this change.

6 marks

(b) Pulau Semakau is located to the south of the main island of Singapore, off the Straits of Singapore. The Semakau Landfill is located on the eastern side of the island and is Singapore's first offshore landfill and is now the only remaining landfill in Singapore.
Both the Ministry of the Environment and Water Resources (MEWR) and the National Environment Agency (NEA) manage the Semakau Landfill. Suppose you are the Permanent Secretary of NEA, and you are tasked to coordinate the expansion of this landfill such that it can become gradually converted to a recreational space for Singaporeans once cells are filled. Using your knowledge in waste management, what are the considerations you would take to ensure that the Semakau Landfill can be opened safely to the public for activities such as cycling or walks?

8 marks


Example 2

Figure 3 and 4 on the next page show two parcels of farmland in Lim Chu Kang and Sungei Tengah that were published by the Singapore Food Agency (SFA) on September 15, 2020.

Given that you worked at SFA as the assistant director in planning the use of both land parcels, one sole for goat farming, the other solely for vegetable farming. By referring to Figure 3 and 4, and applying and integrating knowledge from the CM3261 topics in lithosphere, environmental toxicology, food chain, and waste management, what are some considerations when deciding which parcel of land is best leased for goat farming vs vegetable farming?

Please explain your answers in point form.

24 marks
Example 2 – contextualizing to current events in your country

Figure 3. Map of land for farming near Sungei Buloh, Singapore. Credit: Singapore Food Agency

Figure 4. Map of land for farming near Kranji Reservoir, Singapore. Credit: Singapore Food Agency
Authentic Assessments

Why is this better?

- Focus on analysis and application
- Help students be future-ready
- Maintain integrity
- Synthesis of knowledge rather than regurgitation

Fung Man Fung* and Yulin Lam*

ABSTRACT: COVID-19 has besieged academic institutions worldwide. As countries closed their international borders and imposed lockdowns, faculty have faced unprecedented challenges in finding alternative modes of teaching and assessment as replacements for the traditional face-to-face classes. In this piece, we describe the journey of the chemistry instructors in managing and overcoming the disruptions we faced teaching a freshman organic course in the time of tight safety measures. We describe the change in assessment modes in our course and the impacts of such changes to our students’ academic performance and to our faculty’s teaching feedback ratings.

KEYWORDS: First-Year Undergraduate/General, Organic Chemistry, Curriculum, Hands-On Learning/Maneuvering, Computer-Based Learning, Multimedia-Based Learning, Aldehydes/Ketones, Chirality/Optical Activity, Internet/Web-Based Learning

How Chemists Achieve Active Learning Online During the COVID-19 Pandemic: Using the Community of Inquiry (CoI) Framework to Support Remote Teaching

Hui Ru Tan, Wei Heng Chng, Christian Chonardo, Magdelaine Tao Tao Ng, and Fung Man Fung*

ABSTRACT: As numerous varsity campuses remain closed during the coronavirus disease 2019 pandemic, educators must look for suitable digital tools to conduct lessons and engage learners online. In this report, we discuss how to structure the online lessons using the Community of Inquiry framework (CoI). The CoI was applied to the university elective course “Learning to Choose Better”, taught by chemistry faculty. By using the appropriate digital tools in our course, we found success in achieving engagement, active learning, and team teaching. Until the world finds a resolution to the pandemic, online teaching will continue to be the new normal. Educators could view this time as a prime opportunity to experiment, innovate, and break new grounds in the realm of remote online teaching.

KEYWORDS: General Public, Continuing Education, Interdisciplinary/Multidisciplinary, Computer-Based Learning, Distance Learning/Self Instruction, Internet/Web-Based Learning, Multimedia-Based Learning, TA Training/Orientation
Thank you!

stay connected

FUN.MAN@NUS.EDU.SG
TWITTER @CHEMFUNMAN
Breakout Rooms (30 min)

Introductions (30 seconds per person):
Name, Institution, Discipline, last podcast/TV show/movie/book
Select a reporter, recorder, time keeper, discussion leader.

Questions:
1 - What types of assessments (formative and summative) do you already use online? What works well? Where do you have challenges?
2 - What's your dream (formative or summative) assessment to measure student learning?
3 - How can you adapt your assessment or dream assessments for online learning?
Report out group discussion (+ #chat)

Questions:

1 - What types of assessments (formative and summative) do you already use online? What works well? Where do you have challenges?

2 - What's your dream (formative or summative) assessment to measure student learning?

3 - How can you adapt your assessment or dream assessments for online learning?
Which of the ideas from the discussion today would you like to try in your teaching? (Chat)
Teaching in Virtual Environments
APRU Global Health Program at the University of Southern California
in collaboration with
Global STEM Education Program at the University of Oregon

November 12/13
Technology for Remote Teaching
Eleanor Vandegrift, University of Oregon
Julie Clarke, University of Melbourne

December 3/4
Equity and Access in Remote Teaching
Eleanor Vandegrift, University of Oregon
Michael Antonio Mendoza, University of the Philippines Manila

January 21/22
Authentic Online Assessment
Mona Monfared, University of California, Davis
Fung Fun Man, National University of Singapore

More info or to register: apru.org/our-work/pacific-rim-challenges/global-health