July 20, 2020

StatPREP NEWSLETTER

MAA MATHEMATICAL ASSOCIATION OF AMERICA

STUDENT TO STUDENT INTERACTION IN ONLINE CLASSES

BY KATHRYN KOZAK

In the shift to remote learning, many instructors have complained about the loss of student/teacher and peer interaction. While not as spontaneous or fluid as in-person classes, meaningful interaction is still possible in an online environment. There are several ways to create that interaction: discussion and group activities.

Discussions are very useful for having students interact with other students. Traditionally, discussion is instructor-driven, where the instructor poses discussion prompts and then requires their students to post replies. To create more student to student interaction, students can be required to respond to other students' posts. Another way to create student to student interaction is to require students to post a question on a topic in the reading that they had difficulty understanding. Other students can then reply with an explanation. After the due date, the instructor then reads all the posts and responds if the student's question isn't answered correctly or fully (or compliments the correct explanation given by another student). This type of question and answer interaction creates a sense of students helping each other in the class. Both discussion methods lead to a greater sense of community in the course.

Group activities also require students to interact with each other. The activities can be the same ones that a teacher may use in their face-to-face classes with little or no revision. Most learning management systems (LMS) have the ability to create groups and have group sections of the course where the students can work together on the solutions. Actually creating the groups can be challenging online. One option is to let your LMS randomly assign the students to a group. You can then have the LMS do this for every group work. Regularly changing student groups when doing

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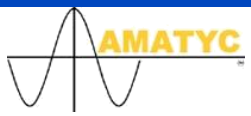

STUDENT TO STUDENT Continued...

collaborative learning is considered a best practice in teaching. However, you may find that your online students take longer to feel comfortable with their fellow students. So you may wish to change groups less frequently than you might in a classroom setting.

You can also create student groups through self-selection by allowing the students to sign-up. Often, more committed students will sign-up early, resulting in students of similar drive working together. A common complaint you will hear from students is that someone in the group is not pulling their weight. Grouping students with similar commitment levels will help mitigate this problem. If you do use the self signup method, then you should also allow your students to request to change groups. There are other management tasks associated with using groups, such as rebalancing them if students drop the class. However, the learning benefits of having students work in groups more than outweighs the overhead of managing the process.

Regardless of how you create the groups, you may consider having your students submit an assessment of participation levels of the other students in the group. This will help students understand that they need to participate in the group work. One word of caution here: online group work might not go as well as you would like. You need to have patience and be willing to try multiple times to make it work well. It may take a few assignments for the students to understand the process. You will also probably have students who will never participate in an online group. However, just as active learning in face-to-face classes produces gains in learning, active learning in online classes will also produce gains. It will take some effort on your part to make sure that the group work is successful in your class, but it is worth it in the end.

MAA CONNECT

Need Help Joining?

Getting Started Guide

Getting Started Video

StatPREP October Webinar

DATA SETS

BY DONNA LALONDE

The Guidelines for Assessment and Instruction in Statistics Education (GAISE) College Report 2016 (http://www.amstat.org/education/gaise) makes the following recommendations:

1. Teach statistical thinking.
    - Teach statistics as an investigative process of problem-solving and decision-making.
    - Give students experience with multivariable thinking.
2. Focus on conceptual understanding.
3. Integrate real data with a context and purpose.
4. Foster active learning.
5. Use technology to explore concepts and analyze data.
6. Use assessments to improve and evaluate student learning.

Access to data sets is essential to accomplish these recommendations. Here are some resources that may be useful as you plan for your fall courses.

If you feel it is appropriate to consider projects related to the COVID-19 health crisis, Laura Le, Kari Lock Morgan, and Lucy D'Agostino McGowan put together a collection of resources to support their eCOTS presentation. The resources including data sets are available at https://coronavirus-teaching-resources.netlify.app.

Census at School is a project formally for middle and high school students, but undergraduate faculty have been able to utilize the available data as well. The project is described here - https://ww2.amstat.org/censusatschool/index.cfm and the description includes access to a random sampler for generating data sets.

Many cities have developed open data portals. For example Washington D.C. makes data sets available at https://opendata.dc.gov. In a recent presentation as a part of an ASA/AMATYC Joint Committee summer 2020 workshop series, Rob Gould described using data on taxi trips available on the City of Chicago's data portal - https://data.cityofchicago.org/Transportation/Taxi-Trips/wrvz-psew.

The Data is Plural Newsletter is a weekly newsletter, published weekly by Jeremy Singer-Vine who is the data editor at Buzzfeed, collects "useful/curious datasets." Here's a link for a recent issue - https://tinyletter.com/data-is-plural/letters/data-is-plural-2020-06-17-edition.

As you plan you may find the summary provide in Appendix C - Activities, Projects, and Datasets - of the GAISE College Report useful. In this appendix, the authors discuss points instructors should consider when designing activities, provide sample projects, and data set resources.

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ONLINE RESOURCES

BY KATHRYN KOZAK

Teaching this fall will be challenging to say the least! We are being asked to teach courses online, or perhaps in some hybrid format. Possibly we will start out teaching in a traditional format and then be forced to move to a remote environment part way through the course. All these challenges raise many questions about how to best accomplish our educational goals. Luckily, there are many resources available to help us.

First, all of the Activities for our StatPREP Little Apps (available at statprep.org under Resources, and then pick Activities for Little Apps) can be used in an online format to have students investigate statistical concepts. Links to the Little Apps and related StatPREP Activities can be inserted into any learning management system (LMS). Students can work collaboratively on the activities, as most LMS have the ability to create and manage groups.

In addition to our resources on statprep.org, there are other sites where you can find materials. TPSE Math (Transition Post Secondary Education in Math) has created the top ten recommended practices for online teachers. The list is available at http://www.ams.org/education/tpse-top-10-online-teaching-practices_v2.pdf

This list was created in consultation with AMATYC, MAA, AMS, SIAM, and the Charles A Dana Center. There are some really excellent insights on this list that can help all of us this fall as we navigate these difficult times.

Other resources have been created by the MAA, AMATYC, and ASA. The MAA put out a statement on recommendations for COVID-19. The statement can be found at: https://www.mathvalues.org/masterblog/maa-recommendations-covid-19-response. AMATYC has held several webinars designed to help instructors teach effectively online. There are additional upcoming webinars at the end of July and August:

- Equity in the Math Classroom: Strategies for Reaching Every Student
- Creating a Community of Learners
- Implementation of the Common Vision through the Eyes of the Teaching Practitioner
- Promoting Student Engagement in Online Statistics Courses

Visit https://amatyc.site-ym.com/page/Webinars to see the dates and times, as well as sign up for one or more of the webinars.

Another resource from the MAA, AMATYC, and ASA are their online communities where members can discuss topics that

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interest them. Please visit these communities and pose questions about teaching this fall so that others from around the country can respond with ideas and support.

StatPREP is also holding a webinar in August on creating a community of learners in an online class. More information about how to participate can be found in this newsletter.

Want more StatPREP? Check out:

http://statprep.org/

BUILDING COMMUNITY THROUGH DISCUSSION BOARDS: ABREVA COMMERCIAL (EDA, BOXPLOTS)

BY AMBIKA SILVA

Creating community in a distance education course is vital. A discussion board engages statistics students to have virtual conversations, which allowed them to build on one another's statistical thinking (Theoret & Luna, 2009). One topic that is appropriate when discussing EDA (Exploratory Data Analysis) or boxplots, is an Abreva commercial found online: https://www.youtube.com/watch?v=EwY2fqI2x7g. The link may vary, but searching for Abreva commercial usually will find it if this link does not work. In it, you will find part of the commercial with the following or a similar statement. The commercial states that in as little as 2 1/2 days you can have relief. In the fine print, it says "Median healing time is 4.1 days, 25% of users healed in 2.5 days".

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BUILDING COMMUNITY Continued...

Sample Prompt and Student Responses

- What is hidden in the commercial, why did I put this in the discussion?
- What do you notice about the commercial?
- Will anything change when you watch commercials in the future?
- How many times did you have to watch the commercial to see the hidden statistics?

Student sample responses can vary wildly, and a few are given here to demonstrate the type of first responses students may give:

Student #1 Initial Post:

"The statistics are hidden in this video at the bottom of the screen in a blended color. I didn't even realize they were there the first time I watched this, I had to watch the commercial three times. You put this in the discussion because it is a very common used strategy in commercials and it involves statistics. The commercial isn't lying, however, they aren't necessarily telling the truth. These kind of commercials will definitely trick someone into thinking it is as fast as 2.5 days, when in reality it is more like 4.1 days. They can't get mad at the commercial because it did tell you it is really more like 4.1 days, just in really small color blended font at the bottom. In the future, I will look out for these hidden statistics and make sure I know all the information."

Student #2 Sample Response:

"The data is also for those who started using abreva the instant the symptoms started showing. Normal people are not like that. People are usually at work r busy at something very important when any symptoms arrive. The real results will be much worse than the data used. It is possible that 2.5 days is not an outlier but just Q1 as later stated in the ad."

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BUILDING COMMUNITY Continued...

Within the discussions, students will respond to each other:

[redacted]

June 24, 2020

"When I first watched the clip I thought it was an advertisement before our actual video, I was very surprised and it made me think that canvas is really struggling for money that they have to run advertisements on their site. After I watched the video about three times and I finally noticed the hidden statistic, I first realized the statistic from the narrator in the commercial. Whereas they were describing an antibiotic that would remove a cold soar in two and a half days. I then watched through the clip a few more times to find any more information, whereas I did find some writing in the fine print at the bottom of the screen. The writing on the screen read "Median Healing time is 4.1 days, 25% users healed in 2.5 days", this shocked me and it makes me wonder how many times have I missed this in previous commercials. Obviously I should know better, medications have many side effects and have been tested thousands of times so they should have an average mathematical study on their product."

[redacted]

June 24, 2020

Hi there [redacted]!

The beginning of your response made me laugh because I thought the same thing and was waiting for the video to start when I realized it had started and ended. I definitely agree that the commercial is deceiving since there are hidden statistics at the bottom of the commercial. I too know that medications have a bunch of side effects anyways and should look out for any suspicious activity in commercials too.

Students grow their understanding through each other, using knowledge they have learned in class. It also lets them laugh together about not seeing the hidden statistics.

What Do I Want Them to Discuss?

I would love for them to realize that the data is likely skewed because they are using the median instead of the mean, that Q1 is 2.5, and that it is likely skewed right

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because there may be some high outliers due to patients taking much longer than others to heal. This sometimes happens and sometimes doesn't, but it does make students more aware of hidden statistics shown in media. After the discussion is over and graded, you can make an announcement or an email on it giving them a little more insight.

Motivation To Do Discussions

Besides getting points for doing discussions, and feeling connected to other students in the class, I often put questions on exams related to discussion boards. For instance, giving the same screenshot as shown earlier with the following essay questions:

1. What shape do you think the data from this study was and why do you think that?
2. Explain why you think the commercial used the median and not the mean.
3. What does that 2.5 represent in the data from the five-number summary?
4. Finally, discuss what, if any, impact this has on when you watch commercials.

Join the Discussion!

Do you have thoughts on using this as a discussion post? Join the conversation online at MAA Connect, https://connect.maa.org/home.

References

Theoret, J. M., & Luna, A. (2009). Thinking Statistically in Writing: Journals and Discussion Boards in an Introductory Statistics Course. *International Journal of Teaching and Learning in Higher Education, 21*(1), 57-65.

UPCOMING EVENTS

AUGUST WEBINAR

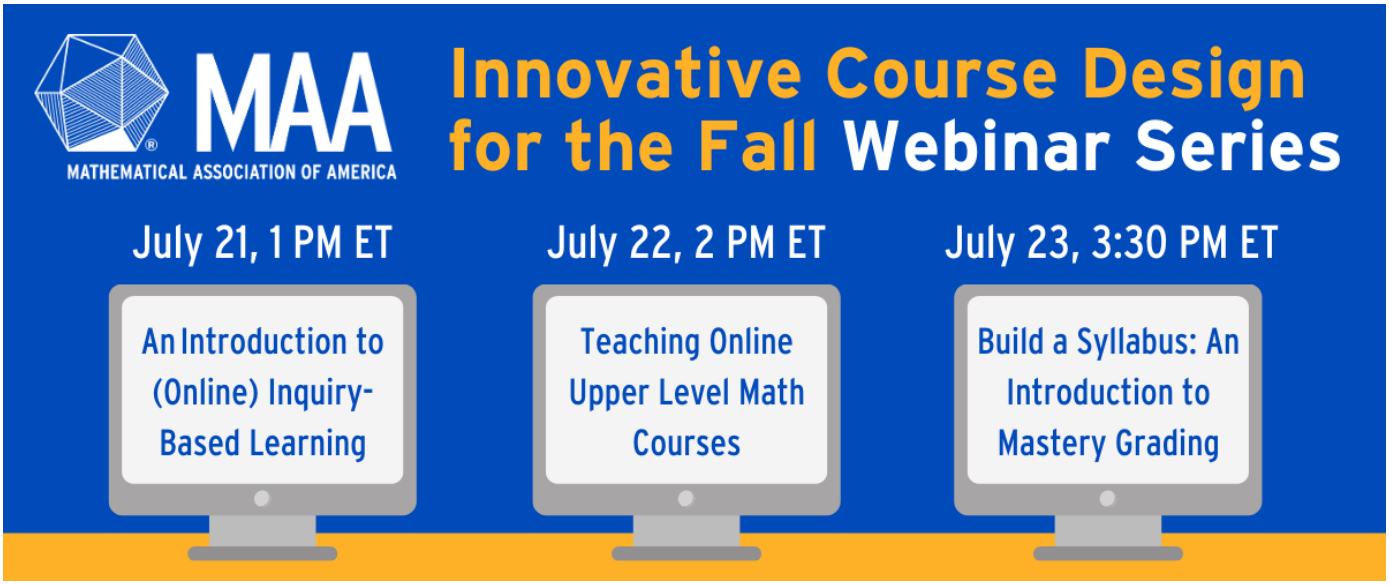
FRIDAY, AUGUST 7

2 PM EDT

Building Community in a Remote Learning Environment

Host: Ambika Silva

A sense of belonging and community is still critical to ensure that students remain engaged and enthusiastic while being in a remote learning environment. Students may be accustomed to finding a sense of belonging from interactions with their peers and classmates in a physical classroom setting. As instruction is delivered virtually, students may likely feel less connected, uncertain, or distracted in their new learning environment. Creating a virtual community is just as important for remote learning as it is in a physical classroom. In this webinar suggestions will be given which can help educators reestablish a sense of belonging for their students.



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