February 9, 2024 Education Working Group Call

Attendees: Antoinette Abeyta, Mary Lofton, Cazimir Kowalski, Jason McLachlan, Rachel Torres, Abby Lewis, Alyssa Willson, Saeed Shafiei Sabet, Jody Peters

Agenda/Notes:

1. Announcements
    a. EFI 2024 Conference
        i. Abstract submission deadline was extended to February 15
           Early bird registration for EFI 2024 conference in due on March 15
        ii. Details about the conference and links to abstract submissions and registration are on the conference webpage: https://bit.ly/efi2024

    b. The TIEE publication on the 4 ethic case-based educational modules for ecological forecasting is now also posted on QUBES; https://qubeshub.org/publications/4629/1.
       This allows us to reach a broader audience and gives us a DOI; doi:10.25334/5D99-Y019

2. Did anyone find papers on chatGPT/AI use in the classroom - pros and cons, best practices, student perspectives, etc?
    a. If people have suggestions, we can plan to discuss those papers for the March call
    b. VT Stream Team had looked at some materials - Mary will go back and look at the materials
    c. Jody could look on QUBES
    d. https://www.chronicle.com/article/im-a-student-you-have-no-idea-how-much-were-using-chatgpt
    e. https://www.nytimes.com/2023/01/12/technology/chatgpt-schools-teachers.html
    f. https://www.technologyreview.com/2023/07/05/1075865/eric-schmidt-ai-will-transform-science/
    g. https://doi.org/10.1007/s12195-022-00754-8
    h. Material on stance from ND - don't use AI for cheating
    i. Demands on students now is higher now, so think students rely on AI to do the busywork and aren't thinking through what they are doing because they have to do so many things simultaneously

3. Two of the Macrosystems EDDIE ecological forecasting modules (targeted at undergrads) have been converted into RMarkdown - Mary
    a. Links to RMarkdown modules here:
    b. Module 6: Understanding Uncertainty in Ecological Forecasts
    c. Using Data to Improve Ecological Forecasts

d. Jason's request for code based material is now available with these RMarkdowns 🙂
e. GitHub repo: https://github.com/MacrosystemsEDDIE
   i. Has material for all 4 ecoforecasting modules developed by Macrosystems EDDIE
   ii. Modules are available in 2 formats - RShiny and now the RMarkdown which has the code under the hood
   iii. Example: Quinn Thomas is using Uncertainty module that will scaffold to allow students at VT to add uncertainty for the forecast challenge
   iv. If you don't want to use code to teach students continue to use the RShiny
   v. But if want the code - go to the RMarkdown
   vi. Mary has done substantial revisions to the RShiny given feedback from instructors that used it in classrooms
      ● They are shorter
      ● Now able to save progress in Shiny so students can work on it over multiple time periods
         ○ Use the bookmark my progress link
   vii. Quinn has been testing out the Shiny versions in his class and it is taking 1.5-2 hours for grad students.
      ● Quinn has been starting with the EDDIE modules - did the intro in Shiny, then Freya worked through tutorial on how to submit forecast to the challenge, then did uncertainty module in RMarkdown so students would add uncertainty to forecasts, then did data assimilation Shiny, then will do decision making in Shiny
   viii. Jason is looking forward to teaching his ecological forecasting class in the future with these new tools
   ix. Now that the tools are getting more developed, now we can start add other things and working with other groups to expand the material to be relevant to other students
   x. Mary's dream - have someone update the repo to add other lakes (e.g., lakes in Australia) or data sovereignty components

4. Overview and discussion of gaps or opportunities for R modules for teaching data science - Jason and Rachel
   a. Self-reflection - when and how did you learn about data and how to collect and analyze it?
      i. Fill in this Google doc with your reflections
   b. Update on what was done last semester at ND in Jason's class
      i. We have content from the course and now thinking where do we go from here - upcoming workshop at the American Indian Higher Education Consortium (AIHEC) Conference in March
      ii. Jason class - Environmental Justice and Data Science. Tried to balance both things. Class was learning about what is environmental justice and

the history of the movement particularly in the US and related to Indigenous environmental justice. The classe worked with Sean Dorr (Computer Science PhD at U of MN who is Anishinabe) and Jeniffer LaCounte (MS student at Salish Kootenai College (SKC)) and Georgia Smies (professor at SKC) all semester.

iii. Georgia had idea of a course for SKC which was learning R - SKC students were more interested when the R material was focused on issues that they could relate to

iv. The class built 4 modules on topics that Georgia identified - each would take 2 weeks
   ● Water quality, bison, fisheries, forestry
   ● Got students to the point where they were making visualizations that show the difference between treatment and control

v. Georgia is teaching the modules now. Only feedback is that the class is going well. Georgia is teaching 5 classes, so not able to provide a lot of feedback. But that is something that Jason/Rachel would like to work on to get more assessment and feedback

vi. Broader goal - make these modules available to a broader audience at Tribal Colleges but also at other institutions as desired. Recognize that the focus of the material will be different depending on the institution it is taught at

vii. Upcoming AIHEC conference - Jason, Rachel, Sean, and Hannah O'Grady (grad student at ND) will be presenting this work at a workshop prior to the conference. Have 40 people signed up. Wide range of ages and backgrounds of participants, but think many have not used R or not much

viii. GitHub code for workshop
   ● Have data from a fictional landscape for a number of monitoring sites which have water quality data
   ● Along with monitoring sites also have culturally significant locations
   ● In beginning - have a discussion with the group to rank cultural sites and use that as a way to bring into R and see the different rankings. Then match those with the monitoring sites. So match the qualitative and quantitative sites
   ● Then by viewing the data and the rankings it provides an opportunity for discussion in breakout groups

ix. What was Caz's perspective from the GA where a similar module was presented?
   ● The GA felt they were short on time for the discussion, so at the AIHEC workshop there will be more time

x. Sean has a clear view between western science and cultural knowledge from Tribes and sovereignty over data and decision making

- Sean will start the day with a discussion on this which will help set the stage for the group
- What is Jason and Rachel's role in talking to Indigenous communities? What is the role of R to help make decisions? How far to get to the discussion and then turn over to Indigenous communities to make their own decisions
- Two way street - want to share R information, but will also be asking people participating in the workshop on how to improve the module
- Want to get people excited to see what R can be used for. Participants will not be able master R in one workshop, but want to get them excited about R and breakdown barriers to using it
- From Georgia's experience - students are off put by the current R resources
- Is it possible to find R resources to share with the workshop participants that aren't off-putting for people who want to continue to use R or learn more about it? Or think more long term can we work with people at AIHEC to how to make more R materials accessible