Higher Education Quantitative Geography Methods Teaching (**HEQGMT**)

COVID-19 challenges in HEQGMT

- Remote teaching
- Lack of student attention
- connectivity
- technology problems - getting into systems
- Inability to respond or help students ef ciently
- Student's couldn't ask each other questions (and help each other)
- Dif culties of engaging some students deu to some shyness
- unable to see what others are doing or share
- Psychological stress of not seeing what others are doing - now hate GIS

COVID-19 solutions to HEQGMT

- Create groups of diverse groups to help each other and collaborate/ work together.
- MS Teams working groups
- Using desktop access to directly help with GIS
- Use a collaborative plateform (i sue Teams for Spatial Analysis) where studnets form small groups and work together and share contenst
- PostCovid, back in class, still using Teams for all studnets, they work always virtually as well as being FtF in the classroom

Existing challenges in HEQGMT

- in my context - few people who can teach specif c Q areas, reluctance to learn new methods
- As a PhD fellow, my challenge was to communicate with people for data collection and disseminiton as mostly everything had to be done by phone call or emails.
- Increased funding pressures on institutions - make staf ng challenging (not enough staff to train students)
- worse staff:student ratios, students have high expectations of custom help
- students are very reluctant to experiment on their own - they wait to be told the "right" answer because this is what they are tauight at school/college
- Heterogeneous student body with different skills and backgrounds.
- COVID issue - not being able to sit shoulder-to-shoulder with students to show them what to do!
- Students lack foundational understanding of how computer OS function (e.g., folders, data)
- "digital natives" are great at using apps and games, but f nd command line so alien, and struggle with most university software which isn't focused on user-friendliness
- Students are used to intuitive applications, f nd it dif cult to get used to software used at uni
- software often gets in the way of learning principles of stats, spatial analysis
- def nitely this!
- digital access - having their own device or not, type of device, quality of internet connection...
- students have different assumptions and f nd it hard to articulate those - they often can't tell us what they are struggling with, we have to work it out ourselves
- Very agreed on this one!
- Student expectations of how easy programs should be to use. Can use Apps but not complex programs (not intuitive enough).
- students who pull out their mobile phones to add up a column of numbers in Excel! feels like we aren#t starting on the same planet!
- Googling information, or using Excel is challenging. Expect answers provided/clear, can use simple Apps, can't solve problems.

Recent innovations in HEQGMT

- Data Science
- LiDAR appliactions
- there are so many different software options, and they keep changing - not sure this is a positive innovation!
- Agree, also it doesn't empower changing of underlying theory - It's constrained to applied work - not able to question underlying assumptions.
- I've been doing this for 20 years - stand along quant courses are less and less "acceptable" to the uni, we're expected to embed skills
- ...into knowledge-led modules. Makes it hard for students to transfer skills sometimes
- Our faculty decided to invest in more GIS lecturers, who help incorporate digital skills in other courses. Not a solution available to all, but probably the best way to invest in such skills
- <Yes - we are also trying to teach some computational thinking basics
- I feel we start at a lower point on entry now so it's hard to pick what new things to introduce
- Bayesian everything!
- Really, or is this a joke?
- slightly sarcastic - Bayesian is def nitely a newer area, and it's all over the research in my sub-f eld,

Emerging and future skills needed in HEQGMT

- problem-solving - developing conf dence in GOOGLING, in experimentating with software
- Programming?
- Data analytics,to be more specif c atleast mastering one programming language
- collaborative online work, studnets have now to be prepared for compolex team work on virtual platforms
- We need multidisciplinary programs that introduce students to spatial and urban f elds as well as data analysis, big data, computation...etc.