Editorial

Geographic Information and Health: Integrating a Course Journal into Public Health Learning

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Abstract: This new journal, Insights and Advances in Geographic Information and Health was launched to address a need to align current coursework that focuses on the interface of geography and population health, with modern pedagogy and andragogy practice that aim to empower students to learn in ways that are more self-directed, participatory, experiential, and applied. Although existing courses that cover Geographic Information Systems in Population Health and Health Geography may vary considerably in their goals, content, and teaching/learning approaches, a course journal – a journal that motivates and engages students in documenting and sharing their skills, accomplishments, and reflections as they advance through coursework – may enhance overall course learning objectives and contribute to broader scholarship. In particular, I distinguish between the concept of a course journal and its more common counterpart, the course project assignment or term paper. I describe changes made to the Geographic Information Systems and Public Health course at the University of Washington to integrate the benefits of a course journal, and the open-source software and recent advances in digital archiving and publishing that collectively enable small-scale course journals. I also discuss issues related to equity, diversity, and inclusion in adopting a course journal.

Keywords: course journal; geographic information systems; geography; public health; quality teaching; pedagogy; academic development

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University courses must be routinely updated to incorporate new learning objectives, content, evolving pedagogical principles and best practices for more effective teaching and learning. Public health courses covering Geographic Information Systems (GIS) also require periodic updates. As GIS data and technologies evolve, course content should be revised to remain relevant. Students need to be exposed to seminal works in the field, such as the classic story of John Snow and the London

cholera outbreak of 1854, as a lesson on the importance of thinking spatially (1,2). But, they also benefit from being exposed to new case studies that demonstrate current applications of GIS to increasingly complex population health challenges. Thus, the story of John Snow needs to be balanced with course content that engages students in conversations about modern digital data sharing, open government data policies, data privacy, and the shift to mobile and Internet-connected devices – topics that have dramatically changed the landscape of spatial data for public health in recent years.

I have taught the GIS in Public Health course at the University of Washington in Seattle, Washington since 2014. Currently, it is a combined 10-week undergraduate and graduate-level course (ENVH 465 and 565, respectively) taught annually in Autumn quarter that aims "to familiarize students with the applications of GIS in public health, and to provide students with practical experience using GIS methods to conduct spatial analyses." The course consists of 1.5 hours of weekly lecture and 1.5 hours of weekly computer laboratory. The lecture period integrates traditional instructor-provided lectures with think-pair-share and small group breakout/report out activities that cover both didactic information and case studies. The laboratory period reinforces the lecture concepts and case studies and consists of seven weekly assignments involving computer exercises related to different sub-disciplines within public health, such as environmental health and environmental justice/health equity, built/social environments and health, infectious diseases and disease ecology, and access to health services. The exercises help to build hands-on problem-solving technical skills, including spatial data visualization and map-making, exploratory spatial data analysis, spatial joins, spatial interpolation, cluster analysis, location-allocation analyses, and digital storytelling. To encourage peer-learning, students may work on exercises in pairs.

While the assignments for undergraduate and graduate students in the combined course differ, graduate students in the ENVH 565 class are assigned an independent final project with a final written project report during the last 3.5 weeks of the course. This final project challenges the students to identify a public health issue, find relevant spatial data, and complete spatial analyses that would inform their chosen issue.

The final project was designed to align with Bloom's taxonomy of the cognitive domain (i.e., a hierarchy of knowledge, comprehension, application, analysis, synthesis, and evaluation) (3). By developing their own projects, students demonstrate cognitive insights at the most foundational levels of the hierarchy, i.e., that they have gained sufficient knowledge and comprehension, such that they can apply what they have learned to their own applications and analyses, and moreover, that they can synthesize the concepts they have learned and communicate the findings of their analyses in writing.

The final projects allow students to go beyond the boundaries of the limited number of case studies that can be covered in the lectures and

weekly exercises, and can be an opportunity for students to integrate public health topics that they are engaged in through their other courses, research work, public health practice activities, and lived experiences. It celebrates the diversity of students' interests and backgrounds and allows them to pursue those elements of GIS and public health that they find most relevant. Projects typically include novel analyses of real-world data sets that the students chose based on their interests. Moreover, because they work with real-world data sets, the findings of their analyses can have public health implications and the potential to inform policy and practice.

Unfortunately, the final papers for the course are perfect examples of the prototypical problematic "disposable assignment" – a considerable amount of student work submitted to the instructor for evaluation and grading purposes that "add no value to the world" because the papers are eventually discarded – a tremendous loss of work and information that could otherwise benefit so many outside of the class (4–7).

Various efforts have been made in recent years to identify solutions to the "disposable assignment" term paper, in the form of non-disposable assignments (NDAs). Exploration into NDAs has occurred alongside of increasing appreciation for, and development of open pedagogy, open educational practices (OEPs), and open educational resources (OER) (8,9). NDAs can include various forms of content sharing outside of a class, including assignments that involve students sharing TED-like videos, infographics, quizlets, products for social media, or a consulting report for a community organization – all of which have the potential for greater persistence and impact (7).

One form of NDA is the mock journal paper peer review process. The process involves students preparing draft journal papers, as well as serving as experts in their field to critically review each other's drafts. This can provide graduate students with broader exposure to science communication by learning about the academic publishing practice. However, if the eventual papers only remain within the confines of the class, then their value and potential for impact are limited.

Course journals have emerged as solution to share the peer-reviewed papers developed by the students with a broader audience outside of the class. Course journals are described as "online, open access academic journals published as part of a for-credit class. Depending on the nature and goals of the course, students may write and provide peer review for journal content, or they may set up the journal, develop policies, and make decisions around the editorial practices." (10)

Recently, I adopted the peer-reviewed course journal concept for the graduate student projects in the GIS in Public Health class in 2024. To accommodate this model, I established assignments that mimic the stages of the submission and review process of a peer reviewed academic journal (Figure 1). Specifically, after the first seven weeks of laboratory computer exercises, each student consults with me on the goals and plans for their project. They then move forward with conducting their

project analyses and prepare a complete draft of their project paper based on a set of course journal author guidelines. I provide the students with a document template to help them organize and format their papers according to the course journal guidelines. I also provide them with a previously published peer-reviewed paper to use an example. The student's draft project paper is peer-reviewed by two other students in the class, using a simple review form that I provide. Students are expected to respond to the suggestions of the peer reviewers and modify their project papers accordingly for final submission to the course journal. After the class ends, students have the option of working with me to post their papers on the university's digital repository, where the student will be listed as the author, and the paper will be shared with the public via an open access license (Creative Commons CC-BY 4.0). The paper is also showcased in the course journal, Insights and Advances in Geographic Information and Health (IAGIH).

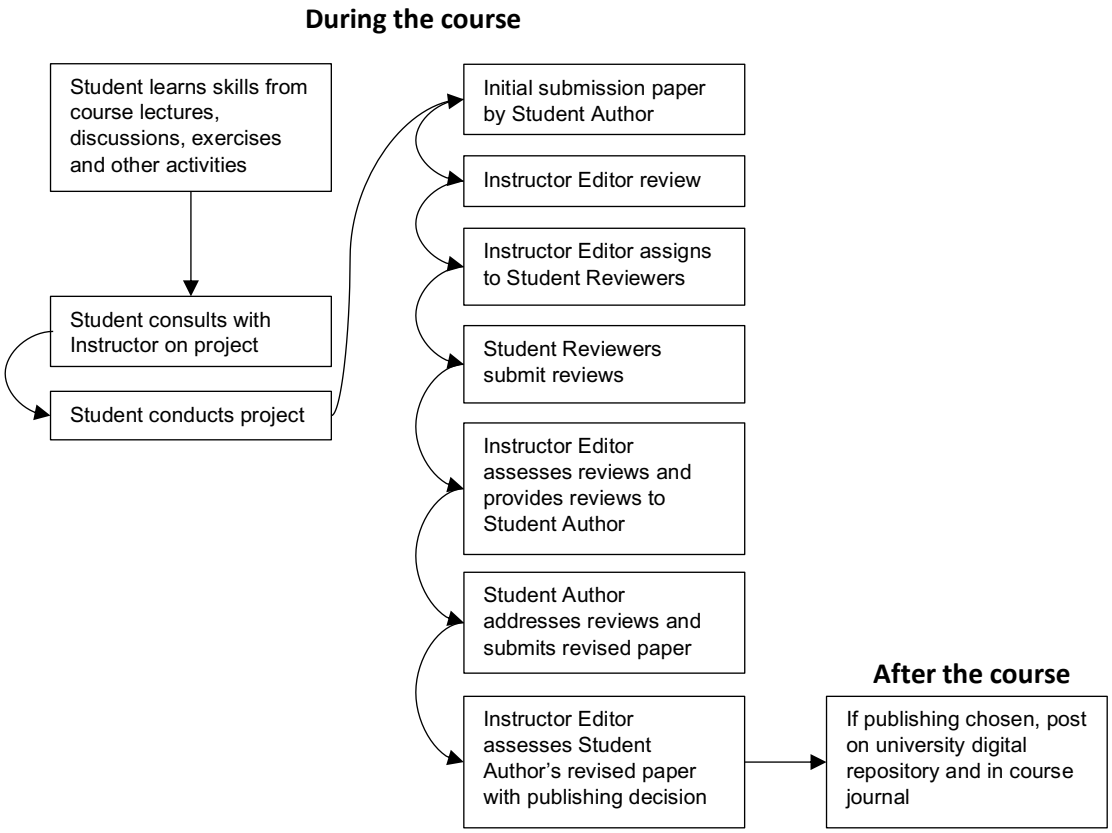

Figure 1. Main stages of the course journal process.

Not only does the course journal assignment provide students with hands-on experience with the typical peer-review and academic open publishing process, but the peer-review allows each student to share their creativity, approaches to GIS and health data analysis, and their

written synthesis of their project findings with other students. Moreover, in reviewing papers, students have an opportunity to develop critical evaluation skills and the ability to constructively communicate the strengths and weaknesses of work conducted by their peers.

It is important that students have the option to choose whether they want to publish their work on the university's digital repository and course journal. In some cases, student projects may involve contributions (e.g., study design, data collection, funding, etc.) of their academic advisors and other colleagues, who may not agree to the work being published in a course journal. In other cases, the intent of a class project may be to inform the later work and the publishing of a capstone project, thesis, dissertation, or more substantial peer-reviewed scientific publication. In such cases, students may not want the findings from their preliminary analyses to be published in advance of the eventual publishing goal. Also, in some cases, students may feel that their course project does not represent their best work, want more time outside of the class to refine their work, and therefore, may not want to share it. For these and other possible reasons, the choice to publish or not is not a graded aspect of the course.

Implementing a realistic journal peer-review process in a course is greatly facilitated by the availability of open publishing software, such as Open Journal Systems (OJS) – a free and open-source journal publishing system that covers all aspects of journal workflow that runs on an open-source Linux-based server (11). In addition to installing the system, it was necessary to setup author and review guidelines for the course journal, and to serve as Editor to manage journal's activities. The university was not ready and willing to host a journal system for courses, and so as the course instructor, I was responsible for learning the OJS system and installing and maintaining it on a server. Still, operating a small-scale course journal was feasible because of free and open-source software like OJS.

There were, however, some aspects of the course journal that were supported due to the university's commitment to open access and the availability of a digital institutional repository for disseminating scholarly work (12). The institutional repository allows student papers to be posted with a persistent uniform resource locator (URL), including a digital object identifier (DOI), which would be challenging to manage by a single instructor for a single course.

Course journals are not meant to replace traditional peer-reviewed academic journals, but rather, can complement them. Because traditional academic journals are increasingly charging article processing fees and involve peer-review processes that are not designed to align with course schedules, they are not suitable for publishing of student work from classes. Traditional fee-based publishing presents numerous equity challenges, especially for students, who would face financial barriers to publishing their course work. Course journals fill an important gap by being more inclusive of student scholars. Course journals can be

integrated into the timeframes of either quarter and semester-long courses and can leverage university and teaching resources to minimize costs to students wishing to publish. As more courses integrate a course journal, students will have increasing opportunities to share their work alongside of other similar papers shared by their peers. Moreover, as the academic community becomes more familiar with the concept and goals of the course journal, student publications in these journals will be better recognized as an appropriate and legitimate form of science communication and scholarship for students that demonstrates and shares the products of their learning.

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