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Pre-service teachers learn to teach geography: a suggested course model

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ABSTRACT

How to improve geography education via teacher preparation programs has been a concern for nearly three decades, but few examples of a single, comprehensive university-level course exist. The purpose of this article is to share the model of a pre-service geography education methods course. Within the course, geography content (physical and social) is paired with different pedagogic strategies (visual, kinesthetic, technology) and other content areas (reading, history) to refine pre-service teacher conceptualizations of geography as a subject and to see geography's potential inclusion across various grade levels. End of course student evaluations demonstrate student satisfaction and learning, while post-course interviews similarly indicate that the class was (1) more useful and practical than other education program coursework for beginning ones teaching career, and (2) stimulated the continued use of geographic concepts and materials.

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Introduction

How to best prepare pre-service teachers for teaching geography – whether teaching as a stand-alone subject or integrated into other disciplinary areas – has been an area of interest for some time, and this has been a global concern. Course content, pedagogic strategies, the use of technology: all have been the subject of inspection. Brooks (2011, p. 177) reminds us that for teachers,

> knowing the subject is not enough. Teachers need to understand the concepts that underpin knowledge in their field, alongside engaging with what their students know about the subject, their experience of it and how they make sense of their experience.

Pre-service preparation to teach geography – or any subject for that matter – is an all-encompassing endeavor.

In the United States, the 1990s saw not only the publication of its first set of national geography standards (Geography Education Standards Project [GESP], 1994), but also a concomitant concern over training future geography teachers that continues today (Bednarz,

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Stoltman, & Lee, 2004; Boehm, Brierley, & Sharma, 1994; Gilsbach, 1997; Havill, Jobin, Maguire, & Miller, 1994; Shirey & Bencloski, 1990).

Much of this concern was summarized in a special issue of eleven articles in the *Journal of Geography* (94, 5). This group of authors reflected on the various facets of the education system (universities, schools, state agencies) and their own positions (university faculty, teachers, deans) related to making positive change for geography education in teacher training. In addition to these thoughts, a useful summation of thirteen recommendations appeared in the overview piece (Bednarz & Bednarz, 1995). Recommendation Nine stated:

> Revise syllabi of courses taken by preservice students to reflect the expectations of the Standards and the K-12 curricula for which these students are being prepared to teach. Re-think the content delivery system, that is, use more active teaching methods and model geography's process of inquiry. (p. 484)

This recommendation, in essence, had been tackled by others previously (Havill et al., 1994; Shirey & Bencloski, 1990), but was largely focused on re-tooling a World Geography course. This might include adding "education" components such as an overview of the Five Themes of Geography, a history of geography in K-12 classrooms, lesson demonstrations, or in one more ambitious example, tying the course to another course in teaching methods in geography (Cole, 1995). In the absence of such a course, geography educators – largely from the National Geographic Society's Network of Alliances for Geographic Education – have attempted to reach pre-service students in methods courses at their colleges of education (Rutherford, 2010).

Other research on improving pre-service education has focused on student perceptions of geography. Catling (2014) surveyed the literature to learn what we know about pre-service primary teachers' geographic knowledge, and considers what uneven geography teacher training in England means for the capabilities of future teachers. Irish researchers Dolan, Waldron, Pike, and Greenwood (2014) surveyed pre-service educators to better understand their prior experiences with geography as a means of enhancing how to improve offerings in teacher education programs. Perception studies such as these are an important step in helping to understand "how they [pre-service teachers] translate and make use of this [perception of geography] to develop their teaching of the subject in the classroom" (Catling, 2014, p. 255).

Additional research has centered on specific interventions in preparatory programs, for example problem-based learning in South Africa (Raath & Golightly, 2017), spatial thinking in the United States (Jo & Bednarz, 2014; Shin, Milson, & Smith, 2016), and using geospatial technology in New Zealand, England, Israel, and the United Kingdom, respectively (Harte, 2017; Jo, 2016; Medzini, Meishar-Tal, & Sneh, 2015; Walshe, 2017). Missing still is a synthesis of these strategies in one place, a single university-level course. Given the competition for disciplinary time within teacher education programs, an entire course outline, inclusive of these ideas, is presented here as a model for others to consider. This is a crucial point: the amount of time available in teacher training for geography education is quite low. In addition to core coursework in the liberal arts and sciences, pre-service teacher candidates in the United States must typically take courses in classroom management; content area reading; assessment; diversity and inclusion; materials and methods; using technology; and content area specialization courses. For the social studies, this last area is often dominated by history (e.g. of the six required courses for middle-level social studies specialization at this

university, five are history). With such a narrow opening for geography, a fine line must be walked between content presentation and pedagogy to best prepare these future educators.

This paper offers the example of a geography education methods course for pre-service teachers developed at the University of South Carolina. Twelve years (2005–2016) of experience and data comprise the examples and findings shared herein. Where this course differs is in the approach to the earlier-shared recommendation (Bednarz & Bednarz, 1995), primarily its focus on the last directive: to "re-think the content delivery system, that is, *use more active teaching methods and model geography's process of inquiry*". (italic emphasis mine). Separate from World Geography, or any other particular topical or regional course, this course focuses on sharing with pre-service teachers the tools, perspectives, and advantages of geography (Hanson, 2004) to enhance their instruction regardless of their ultimate subject area focus. Mutually dependent types of knowledge form the basis of course dialog: knowledge of geography (core knowledge), key concepts and ideas (content knowledge), and thinking geographically (procedural knowledge) as distinct from other ways of knowing (Firth, 2015, p. 58).

More specifically the course attempts to be the exemplar called for by Bourke and Lidstone (2015, pp. 10–11):

> [T]ransformations in pre-service teacher education … include changing pre-service teachers' conception of geography from a narrow information-oriented view to one that encompasses "a structured way of exploring, analysing and understanding the characteristics of the places that make up our world" (ACARA, 2014) … They [educators] need to enable a deep understanding of how to think conceptually, for example, knowing the difference between place and space and the importance of the interconnection between the physical and human worlds … Teacher educators need to role model and teach with passion, innovation, and creativity, diminishing any negativity from previous experiences … it is the teacher educator's job to develop the capacity of pre-service teachers to be competent, critical, and creative users of the inquiry method …

To assess whether that promise held true for this particular course, the course evaluation responses and the results of a post-course student interview are shared. Properly viewed as action research, where "research is undertaken by practitioners in order that they may improve their practices" (Corey, 1954, p. 375) as opposed to research for generalization, this work was "conducted in the heat of combat" (376) and comes from a decade-long period of introspection as the course has changed due to a variety of reasons (new state-level academic standards; Common Core; the *College, Career, and Civic Life (C3) Framework for Social Studies* (2013); new academic research). Although this is a U.S.A-centered case, these specific findings should nonetheless find broader applicability.

The need for a geography (education) methods course

A number of very practical reasons necessitate the careful creation of a geography education methods course. These include ensuring (1) that teacher candidates possess an appropriate content background, (2) that their conceptualizations of geography as a discipline are refined, and (3) that the gap is filled where instruction focuses merely on a very broad social studies (typically history) and little physical science.

Good geography teachers must be sound in their content knowledge. If they are not, "they may not know enough about the subjects and topics they teach to respond effectively to students' enquiries. This means that they might not be able to ensure students receive

accurate and appropriate information to develop sound understanding" (Lane & Catling, 2016, p. 208). Pre-service teacher confidence in subject matter and skills varies to the degree in which geography courses formed a part of their course of study (Harte & Reitano, 2015). Particularly troubling, however, are instances where even students with undergraduate degrees in geography have at least some hesitation about their competencies to teach school level geography (Rynne & Lambert, 1997). While a geography education methods course cannot possibly cover all content – this should come from other paired coursework – the opportunity does exist to reinforce previously learned material or at least provide a basic level for those students without.

Pre-service teachers are at a stage where they are processing ideas related to pedagogy and their own notions of the subject area they hope to teach. It is important then to consider "… how [for them] geography is personally defined and how these definitions [will] influence the ways in which they teach the subject" (Arenas-Martija, Salinas-Silva, Margalef-García, & Otero-Auristondo, 2017). From personal experience, these students are both receptive and malleable. As one student commented concerning the course described in this paper:

> This class has helped me more than some of my education classes in defining my education philosophy. (2009)

This, then, is an opportunity for geography not to miss.

Preston (2014, p. 343) found that primary pre-service teachers had a very narrow information rather than process-oriented perception of geography that focused on "broad knowledge about the world and locational knowledge and skills". Personal experience confirms this finding, and extends it beyond the primary level. Others, too, have investigated teacher conceptualizations to learn more about how these perceptions impact geography teaching (Brooks, 2006; Seow, 2016; Walshe, 2007). Important here for this course is the prospect of refining these conceptualizations early to make good geography teaching seem not only possible but worthwhile.

The final reason for this type of course? Few exist. Most teacher training programs require a mix of content area and methods courses, but this is highly variable (Brysch, 2014; Womac, 2014). As geography is typically treated within the social studies (read history, primarily) in the United States, pre-service teacher methods training can exclude physical or environmental geography as well as technology. If geographers want geography to be taught well, then opportunities must be created for pre-service teachers to learn how.

The course described within is an attempt to do three things: engage pre-service teachers with geography content and methods (human and physical, technology); explore pedagogies for the content, including how geography may pair well with other content areas; and to hone or improve a more accurate conceptualization of geography and its mode of inquiry.

Aims and components of the course

The course, *Contemporary Issues in Geography Education*, is presented to the student as follows:

> Geography defines itself not by its subject matter, but rather by its perspective or worldview. Geography is content-driven, graphically rich, technologically sophisticated, and applicable to other subject areas. This course helps prospective teachers acquire geographic knowledge and skills needed to understand the spatial characteristics and interactions of important physical, demographic, cultural, political, and economic systems. Students enrolled in this course will

acquire theoretical and practical knowledge of geographic philosophy and methods, and will be able to use geographic knowledge and methods in pedagogical contexts.

But what exactly do we mean by geography's "perspective or worldview"? From *Geography for Life* (2012), two perspectives are offered: the spatial and the ecological. The former "is concerned with the spatial dimension of human experience (space and place)" (17), while the later focuses on humans and their relationships to biotic and abiotic elements on Earth. Six elements then explore places, regions, physical systems, human systems, and nature-society interaction along with tools and applications. The C3 Framework (2013) is a similar, stripped-down take on the discipline with a focus on Spatial Views of the World; Places, Regions, and Culture; Spatial Patterns and Movements; and Changing Spatial Patterns.

Geography, then, though circular, is about thinking geographically about the world and all its parts. Per Morgan (2013), "to think geographically is to have a trained capacity to construct a mental map to see patterns, to recognize relationships, to see movement, to take that map and 'clothe it in meaning'" (275). It is with that "meaning" that we come to understand geography as "the study of the earth [*sic*] as the home of people" (Tuan, 1991, 99). Educators armed with these perspectives are better prepared to entertain existential, ethical, intellectual, and practical questions as they pertain to Earth (GESP, 1994, pp. 23–24).

A different approach proffered by Gersmehl (2014, p. 3) sees geography in local and global terms. A local rationale for geography is about "understanding the place we are" to help us better organize said place, while the global rationale is about "understanding conditions in other places and our connections with those places". Both are utilitarian and of use given the education circumstances of this university's location. South Carolina expects its high school graduates to have world-class knowledge, world-class skills (including critical thinking and problem solving), and life and career characteristics such as a global perspective for college or career readiness (South Carolina Department of Education, 2015). Geography, then, must be shown as a discipline that is also capable of serving the state's workforce needs. By design this course attempts to engage each of these perspectives. While one may quibble at the edges of the view of geography provided above, it is possible to appreciate the time- and place-bound strengths and weaknesses of each.

Organized around a presentation of varied geographic content to include the full sweep of the discipline (e.g. climate, soils, ethnicity, political systems, and so on), the course content is presented via visual, kinesthetic, and other approaches to learning while using a variety of different materials and technologies. For example, one late-semester activity uses an online geographic information systems (GIS) to explore how politics somewhat incredulously superseded physical site considerations in locating a bridge (Mitchell, Cantrill, & Kearse, 2012). In each instance, an effort is made to develop technology, pedagogy, and content knowledge (TPACK) (Doering, Koseoglu, Scharber, Henrickson, & Lanegran, 2014; Mishra & Koehler, 2006) – or at least at this stage an awareness of the possibilities. Creating self-discovery (i.e. *aha!*) moments for pre-service teachers in this course is a key component to demonstrate their own capacity for transforming geographic content knowledge into forms that are pedagogically powerful for their future students (Reitano & Harte, 2016).

Course design

The three-credit course is "split-level", meaning that it carries a course number that is the highest an undergraduate student may take and is also the lowest available for credit

for graduate students. An important development early on was the requirement by the University's College of Education that the course be a mandatory part of the middle-level education program (the one outlier in that suite of history course offerings). Accordingly, the majority of students in the course are seeking middle-level certification. However, given that the course is open to graduate students primarily seeking Master of Teaching (MT) or Master of Arts in Teaching (MAT) degrees, there usually are several students focused on secondary education (the most subscribed area for these particular degree candidates). The course has averaged 30 students each year (364 total); 82 have been graduate students (22.5%). The course meets twice weekly (75 min per meeting) over the course of a fifteen week semester.

Intended learning outcomes

The main learning outcomes for the pre-service students in this course include the ability to:

- Use historical/cultural/political contexts to analyze social and environmental issues at all scales.
- Apply the principles of the natural sciences to contemporary issues.
- Use technology to understand spatial relationships.
- Incorporate geographic concepts within the K-12 classroom.
- Complete a lesson plan that engages K-12 students in geographic thinking.

One of the most difficult aspects of meeting these objectives is the backgrounds of the students themselves. Given the paucity of geography in their own K-12 education, some students naively assume that map-coloring exercises and place-name memorization will carry them through. To them this is geography. This is compounded by the lack of geography courses taken at the university level. In the most recent course offering (2016), of the twenty-four education students (four others were geography majors with a possible interest in teaching) only six had taken a university-level geography course. Of those six, one had taken two courses. Within that group, some students are preparing to teach at the elementary level, some at the middle level, and the rest at high school. Furthermore, their conception of geography tends to include social studies but not the physical sciences. This variety of some to no geography course experience and different teaching level aspirations makes the teaching of this course challenging. Basic geographic content and concepts must be taught alongside pedagogical strategies while being mindful of how the pre-service students might relate the same to their future students (be they elementary, middle, and so on). It is incumbent upon students in this course to think about how an example provided at the middle level could be translated to younger or older students as it is not possible in fifteen weeks to cover each potential scenario in this course.

Original structure and modifications

Beginning in 2005, the course was structured much like the regional course proffered by Havill et al. (1994) but rather taught systematically. Students endured a lecture-heavy exploration of culture, gender, physical systems, economic geography, and so on with pedagogic strategies sprinkled in. Discussions with students over several years about how this course fit in with their other education courses made it clear that they desired a more practical

"nuts and bolts" course with tried and true ideas on how to actually teach geography. The geography content, while important, needed a more equal balance with lesson design and planning, and how geographers themselves thought about teaching. As a result, the course shifted seven years ago toward a focus on themes in geography, especially as they relate to other curricular areas such as Common Core ELA (2010) (see next section). Less time is spent lecturing with more deliberate and focused class debate and discussion (see panels in Geography Pedagogy section), as well as time spent on proper use of geospatial technology (e.g. GPS units, online GIS) and other geographic inquiry (National Council for the Social Studies [NCSS], 2013).

Present course organization/activities

Four main study sections now comprise the course (in chronological order): Geography as a Discipline/Introductory Concepts; Geography and Literacy; Geography and Mapping; and Geography and Technology. Two more sections "float" over the course as a whole, punctuating the schedule at various times during the semester. These are Geography Pedagogy and Geography Lesson Planning (Table 1).

Geography as a discipline/introductory concepts

This study section begins with an overview of basic concepts and definitions (remember that few have had a university geography course), geography education standards, and map literacy. Time is spent on atlas use (Veregin, 2010) as part of the last item to demonstrate the various forms geographic information takes (maps, tables, charts), how those forms

Table 1. Sample course topic schedule.

Study section	Topic
Geography introduction	Geography – introductory concepts
Geography introduction	Geography – introductory concepts
Geography lesson planning	Final project review/geography standards
Geography introduction	Regional geography
Geography introduction	Map literacy and atlas use
Geography pedagogy	*Teaching Geography* discussion (Ch. 1–2)
Geography and literacy	Geography and reading: trade books
Geography and literacy	Geography and reading: primary sources
Geography and literacy	Geography and reading: technology
	Exam 1
Geography and mapping	Mapping physical features: topographic maps
Geography pedagogy	*Teaching Geography* discussion (Ch. 3–4)
Geography and mapping	Mapping history and science: Choropleth
Geography and mapping	Mapping history: Sanborn maps
Geography pedagogy	*Teaching Geography* discussion (Ch. 5–6)
Geography and mapping	Giant traveling maps
Geography and technology	GPS/Geocaching
	Exam 2
Geography pedagogy	*Teaching Geography* discussion (Ch. 7–8)
Geography and technology	Virtual globes: economic geography
Geography and technology	Online GIS: story maps/geoinquiries
Geography pedagogy	*Teaching Geography* discussion (Ch. 9–10)
Geography and technology	Online GIS: creating/adding data
Geography lesson planning	Lesson plan demonstrations
Geography lesson planning	Lesson plan demonstrations/conclusion
	Final exam

might be used for simple activities like "bell-ringers" on through higher-level work, and as example of using geographic representations (NCSS, 2013). This five-class sequence ends with a class discussion of the course text that also begins with introductory geography concepts (see 'Geography pedagogy' section ahead).

Geography and literacy (reading)

Realizing full-well that many of these pre-service teachers will not be teaching a stand-alone geography course, it is important to showcase "back door" strategies for including geography instruction in other disciplinary areas. This forms the core rationale for including a study section on Geography and Literacy,[1] but three other points matter, here: (1) many of these students also are seeking an English/Language Arts certification making this a logical point of entry, (2) research exists to show that geography instruction can positively impact reading achievement (Hinde, Popp, Jimenez-Silva, & Dorn, 2011), and (3) this study section evolved with developments from national standards movements in the United States, in particular the Common Core State Standards for English Language Arts (2010), and was further illuminated by a geography alignment guide created by the National Geographic Society (2013).

Activities in this study section include working with children's trade books, primary and secondary source texts, and technology. Two elementary level trade books are used in two separate lesson presentations, one on American history and civil rights (Mitchell & Collins, 2014) and a second on ocean currents and pollution (Mitchell & Hance, 2014), to show the applicability of geography and reading across both social studies and science. Each is an example of geographic inquiry whereby questions are answered by extracting spatial information from the text for subsequent mapping. Using primary and secondary sources more appropriate for middle and secondary level students, the pre-service teachers explore a legal document that created a state political border and also design a working agricultural plantation (Mitchell, Collins, Wise, & Caughman, 2012) solely from the texts alone. The final activity involves creating a Google Lit Trip (Burg, 2016) of Lewis and Clark's nineteenth century expedition across the United States using the book *Undaunted Courage* (Ambrose, 1996). In each of these instances, and for a variety of student levels, students is this course are shown how reading, and specifically its concept of *setting*, can be paired with geography to better understand *place*.

Geography and mapping

The Geography and Mapping and Geography and Technology sections are somewhat arbitrarily separated by a low versus high technology divide. Paper and historic map use populate the former and GPS and GIS the latter. Both study sections are designed to increase student comfort level using a mainstay of geography – the map – to not only display information but rather to illuminate or uncover meanings not readily seen without a spatial representation.

Three general map types are explored: topographic maps, choropleth maps, and historic maps (specifically Sanborn fire insurance maps). These choices are deliberate in the short amount of time available across this course. First, topographic maps can pull these often social science-oriented students into physical geography. Problems are devised whereby a human problem (say, where to locate a mining operation) must engage with physical features, elevation, and so on. Determining slope introduces mathematics. A final unstated goal is preparation for their teaching certification test (*Praxis* in this state; Educational

Testing Service [ETS], 2016); previous versions of the exam have had geography questions that required interpreting isolines, a key feature of topographic maps (contour lines). Noted by one student among others:

> Made the material easy to learn but still made you think about what you were learning. Very helpful in preparing for Praxis and lesson planning. (2008)

Choropleth maps abound in geography and other textbooks; indeed they are prevalent in many atlases, including the one used in this course (Veregin, 2010). Regarding mapping generally, students are shown how the same data-set can be presented in markedly different ways to create a map with subsequently very different interpretations. The choropleth map is no different in this regard depending on how one chooses the number of categories and data breaks. These points are made with two activities, one historic and one contemporary. The historic example is indeed historic, focusing on agriculture during the U.S. Civil War. Students use 1860 agricultural data to map traditional "Southern" crops such as rice, cotton, and tobacco. The choropleth mapping result shows that a large amount of tobacco was grown in northern states, rendering suspect the simple notion of an Industrial North and an Agrarian South. Maintaining the agricultural theme, students then map modern fruit crop data to see how those crops will shift spatially over time due to climate change. Not only do students become familiar with this mapping strategy and its pitfalls, they learn how to read current choropleth map examples and consider how creating their own with students can enhance instruction.

Sanborn fire insurance maps have grown far beyond their original purpose to now include historic examination of urban areas across the United States. Given the history-dominated social studies curriculum in our state, and the fact that each of these maps in our state has been digitally scanned and is available online, it makes sense to spend time on this resource. In this course, we conduct a walking tour of our downtown and use the maps to identify landscape changes from 1888 to the present. This activity is directly applicable to our state's high school geography standards and also serves as an example for those students who may eventually teach a stand-alone geography course.

One final class in this study section is dedicated to National Geographic's Giant Traveling Map (GTM) program. These maps, as large as 25 × 35 feet in size, have been very popular with students and educators (National Geographic Society, 2016). In this course we consider how GTM use can highlight different modalities for learning information (e.g. visual, aural, read/write, kinesthetic; Fleming & Mills, 1992), with a focus in this case on the kinesthetic. This allows the pre-service teachers to wrestle with how an exciting teaching aid may or may not produce the desired learning effect if its young users are not ready to comprehend a "birds-eye" view of their state or continent.

Geography and technology

Introducing geographic digital technologies is a final and central content area, especially given its paucity of use (though increasing) in K-12 schools (Kerski, Demirci, & Milson, 2013) and its growing importance as a career option (Hong, 2016). Pre-service teachers are an important audience as their receptiveness toward geospatial technology, and hopefully subsequent classroom utilization, is generally higher than in-service teachers (Strachan & Mitchell, 2014).

A four-step activity progression is used that begins with global positioning systems (GPS) and ends with online GIS use. The GPS activity focuses on geo-caching, using mathematics and landscape clues to navigate a campus route. How the GPS receivers function and can be used to collect data for subsequent mapping is emphasized, along with learner benefits to include math, spatial thinking, history and geology (site investigation), and even physical education as students teams tend to become quite competitive as they race each other.

The technology moves back inside and works through visualization software such as Google Earth and ultimately to Esri's ArcGIS Online. Over several days, the students use pre-made kml files in Google Earth to understand industrial site location, then move on to pre-developed layers in ArcGIS Online, and ultimately to adding their own data for mapping in the GIS.

There are two primary goals here: (1) exposure to geospatial technology, developing *confidence* as opposed to *competence* that will come with more practice, and (2) "to develop the capacity of pre-service teachers to be competent, critical, and creative users of the *inquiry* method …" (Bourke & Lidstone, 2015, p. 11; italics mine) Here, and in the previous course section activities, the pre-service educators are exposed to the Inquiry Arc as explained in the *College, Career, and Civic Life (C3) Framework for the Social Studies State Standards* (2013) and shown how this applies to geographic reasoning. The Inquiry Arc features four dimensions: developing questions and planning inquiries; applying disciplinary concepts and tools; evaluating sources and using evidence; and communicating conclusions and taking informed action. Another activity in this course section illustrates the Inquiry Arc by having students investigate the spatial pattern of streets named for the late civil rights leader Martin Luther King, Jr. (Mitchell & Alderman, 2014). The students question where these named streets are likely to be found (regionally, urban v. rural) and whether or not a certain sociodemographic element is at play. They engage with topopnyms, segregation, and choropleth maps, and answering the questions requires using an online GIS and importing external data to be compared with census data. Finally, they discuss the power relations within a place that make street-naming possible or not. Critical thinking and problem solving are key components of inquiry, and it is these types of lesson activities that help to prepare these pre-service educators to engage in inquiry-based work with their own students.

Geography pedagogy

The Geography Pedagogy and Geography Lesson Planning sections take place roughly every other week. For example, five class meetings are dedicated to discussing Gersmehl's *Teaching Geography* (2014) to explore geography pedagogy. An "expert" panel of five to eight students prepares answers to questions proposed by the instructor for two book chapters at a time. These written statements serve as the basis for discussion with the remaining students who have crafted their own individual questions on the reading. Discussion prompts have included:

> Gersmehl describes (p. 12) different academic perspectives (science, history, etc.). He keeps geography and science separate. In your opinion, can a geographer also be a scientist? Provide examples for or against your position.
>
> On p. 102–103, Gersmehl dismisses the idea of teaching with imaginary places. Do you agree with this position? If not, how could you use this technique successfully? By extension, does his position invalidate teaching fiction (literature) v. non-fiction?

These panel discussions can be lively – students are free to and often do disagree with the assigned text – and were added to the course as a direct result of student feedback. Where students in previous years read the same or similar as background material, they expressed a desire to explore more deeply these content areas and pedagogical strategies with their instructor and each other. In many university-level courses, students are "talked at"; here their voices are heard and misconceptions are clarified. This text also is useful as it comes with a CD-ROM of lesson plans that can greatly assist a novice teacher.

Geography lesson planning

Geography Lesson Planning is the final "super section" overarching the course. Comprising 25% of the final course grade, a lesson plan is created by each student to prepare them for not only teaching geography content but to reflect on objective writing, instructional methods, and assessment. To assist in this process, students inspect *Geography for life: National geography standards* (Heffron & Downs, 2012) and the appropriate state academic standards for science and social studies (*South Carolina Academic Standards and Performance Indicators for Science,* 2014; *South Carolina Social Studies Academic Standards*, 2011). Time is spent in class as a group and in individual meetings outside class to create a standards-based topic, devise a teaching strategy that includes an inquiry activity within the lesson, and write assessable objectives. Several students are selected by their peers to present their lessons at the close of the semester, and the author also has successfully published some of the better work with the students as co-authors.

Regardless of the study section for a given day, each class period ends with a teaching material giveaway and where possible this matches the general theme for that day. For example, a climate change map produced by the National Geographic Society was distributed on choropleth mapping day (e.g. agricultural shift example).

Student assessment

Student performance in the course is assessed through three exams, a lesson plan, and participation. The exams (60% of the final course grade) contain a mix of multiple-choice, fill-in the-blank, short answer, and essay questions; this variety is designed to appeal to the different strengths students possess in test-taking. Per Gersmehl (2014), the questions focus on more than factual knowledge (multiple-choice, generally). Skills, such as map use, are tested via a series of atlas focused questions ("what is the July high pressure for 30°N, 40°W?"). Such questions often demand looking through an index to find the map topic, then finding a coordinate pair on the map, and finally interpreting the legend to provide an answer. Theoretical disciplinary understanding is measured through short answer questions ("define and provide an example of finding a spatial analog"), and essays are longer treatments where student demonstrate their ability to link geography and pedagogy ("… this course has provided multiple lesson strategies for incorporating geography into the reading curriculum … in this essay, you are to devise an *original* lesson strategy that incorporates geography and reading …").

The lesson plan (25%) can be on any topic granted that an appropriate connection can be made to at least one of our state's academic standards. Unsurprisingly, the topics generally are history-centric, but some students do venture into physical science and mathematics (see Table 2 for examples). The students are provided with multiple benchmarks in the

Table 2. Selected lesson plan topics and objectives[a].

Year	Lesson title	Grade level	Course	Sample objectives
2005	World War II geography	7	World History	(1) Create maps of Europe and the Pacific (2) Explain the main invasions of other countries by Italy, Germany, and Japan
2005	The United States: regions within a region	11	U.S. History	(1) Apply various characteristics to the several regions within the United States, demonstrating their understandings of these regions and their different economic, ethnic, and cultural evolutions (2) Know how the Five Themes of Geography apply to the United States as a whole, and in the many parts therein
2006	The geography of war	11	U.S. History	(1) Differentiate between "free" and "slave" states (2) Identify the states with African American population c. 1860 and the percentage of African Americans in comparison to the overall population
2007	Global terrorism	11	U.S. History	(1) Identify (based on class size) 11–15 terrorist acts worldwide since 1972 mapping each incident on a world map (2) Locate and map their specific terrorist act using either ArcGIS Explorer or Google Earth
2008	The foundations of democracy: made in Athens	6	World History	(1) Distinguish the relationship between the present form of democracy in the United States and the initial form of democracy in Ancient Athens (2) Comprehend the importance of citizenship
2010	British influence on Indian culture and trade	9	Global Studies	(1) Map Indian trade routes before and after British colonization (2) Reflect on the positive and negative effects of British imperialism
2011	World War I, the trans-Atlantic trade, war and U-Boats	11	U.S. History	(1) Illustrate a spatial understanding of the North Atlantic trade routes and their strategic location to both Britain and the United States (2) Explain the reasons for German U-boat warfare conducted against the trade routes between Britain and North America
2012	The black death: origins, spread, and occurrence	6	World History	(1) Construct a map using textual information and draw conclusions about the effects of movement and migration (2) Identify factors in the differences between rural and populated areas and what that means for the spread of disease
2013	Low country rice cultivation: Striking "Carolina Gold"	8	State History	(1) Explain how South Carolinians used natural and human resources to gain economic prosperity (2) Explain how rice cultivation made South Carolina a wealthy colony
2014	Caleb Godfrey & How the Pineapple came to South Carolina[b]	8	State History	(1) Use primary and secondary source documents to re-trace a popular eighteenth century transatlantic trade route onto a period map (2) Recognize the type and nature of connections between colonial America, West Africa, the Caribbean, and Great Britain that typified the eighteenth century transatlantic trade

(*Continued*)

Table 2. (*Continued*).

Year	Lesson title	Grade level	Course	Sample objectives
2014	Civil war engagements	11	U.S. History	(1) Research Civil War events to gain a better understanding of the pivotal moments throughout the war (2) Explore a comprehensive Google Earth file to put the events of the war in a chronological and geographical context
2014	*Company Aytch*: examining the importance of transportation in the American civil war	11	U.S. History	(1) Create a map based of the travels of Sam Watkins in the Western Theater (2) Analyze the spatial relationship and importance of the railroad junctions at Corinth, Nashville, Chattanooga, Atlanta, and Memphis in the Civil War
2015	How the potato changed the world	6	World History	(1) Identify patterns and networks of economic interdependence through trade and commerce over the course of the Columbian Exchange (15th and 16th centuries) (2) Demonstrate an understanding of the impact that specific items had on different cultures worldwide.
2015	Tracking the black death: where did it happen?	9	World Geography	(1) Use technology (specifically Google Earth) to map the location of the primary sources (2) Make inferences about how this disease spread, making connections to trade and the movement of people

[a]Lessons developed by interviewed students.
[b]A variation of this lesson was eventually published; see Dawson and Mitchell (2017).

semester, turning in their objectives, standards, and so forth at various points for feedback before the final product is due. Clear objective writing is a primary focus; the objectives must focus on some type of action and be assessable. Some finished products are more successful in this regard than others. For example, the lesson on rice cultivation (Table 2) has students "explain" but does not provide information on how to do so (e.g. verbally, in writing, etc.). Contrast this with the lesson on the Black Death where the objectives specify a work product ("construct a map") and subsequent analysis.

The lesson is assessed for adherence to format, grammar, utilization of geography concepts, innovativeness, utilization of a wide range of resources, and whether the objectives, procedures, and assessment are well-stated. As noted previously, several of the lesson plans have been published after additional work and represent a considerable resume achievement for a beginning teacher.

Participation (15%) forms the final part of the course grade. This includes a series of in-class assignments (generally participation in the day's lesson strategy) and short papers such as those prepared for the panel discussions (see section 'Geography pedagogy' earlier).

Student feedback

Student feedback from course evaluations over the past 12 years provides evidence of learning, course satisfaction, and potential areas to improve. A standard course survey given at the end of each course provides much of the data reviewed here (Table 3). Students also are able to respond to four open-ended questions: strong points of the course/instructor; weak points of the course/instructor; comments on class lectures, assignments, and materials; and other comments. The student quotes throughout this paper come from these final questions.

Kirkpatrick and Kirkpatrick (2006) provide one evaluation method for judging learning processes. Their four steps consist of:

- Step 1: Reaction – How well did the learners like the learning process?
- Step 2: Learning – What did they learn? (e.g. knowledge and skills)
- Step 3: Behavior – What changes in performance resulted from the learning process?
- Step 4: Results – What are the tangible results of the learning process in terms of reduced cost, improved quality, increased production, efficiency, etc.?

Table 3. Course evaluation responses: course and department averages.

Evaluation items	Course	Department
Course content		
The instructor clearly stated the instructional objectives of the course	4.88	4.52
The instructor clearly stated the method by which your final grade would be determined	4.87	4.55
The instructor clearly graded and returned the student's written work in a timely manner	4.84	4.39
The presentation of the course by the instructor was organized	4.95	4.44
The grading policies of the course were fair	4.78	4.40
Course mechanics		
The instructor's lectures/presentations made the subject interesting	4.87	4.09
The instructor stimulated thinking	4.90	4.21
In this course I learned a great deal	4.81	4.26
I would recommend this course to others because of its educational value	4.85	4.11

Note: 1 = strongly disagree, 2 = disagree, 3, 4 = agree, 5 = strongly agree.

The student evaluation data presented here can provide insight for Steps 1 and 2; Steps 3 and 4 are open for more discussion and were explored via a post-course interview.

Course content satisfaction (steps 1 and 2)

> This was easily the best course I have ever taken at this university. The course was well-organized, tailored to the audience, and applicable to anyone who desires to teach (even if they are not specifically teaching geography). (2012)
>
> The professor did what many other instructors have failed to do semester after semester – challenge me. He went above and beyond the calling of a geography professor. He taught me how to be creative and engage my students through teaching the class a variety of lessons. He turned us into environmentalists, historians, and economists. (2012)

Clearly students like the course (Step 1; see also Bourke & Lidstone, 2015 on teacher educators as role models and teaching with passion, innovation, and creativity) and report learning knowledge and skills (Step 2) that they believe will help them as future teachers (geography or otherwise). They appreciate the wide variety of content and disciplinary areas covered – from literacy to technology use – and overwhelmingly believe that presentations were interesting (4.87/5.0) and stimulated thinking (4.90/5.0). Most also believe that they learned a great deal (4.81/5.0) and would recommend the course to other based on its educational value (4.85/5.0).

Changes in performance (Step 3) and tangible results in improved quality (Step 4) are more difficult to tease from these evaluation data. From the pre-service teaching cohort here, they report that they will use many of the strategies demonstrated to them and feel more assured in their ability to better teach geography content. While this speaks to their *intentions* as opposed to actions as they are not yet in the classroom, this confidence boost is a noteworthy achievement.

Changing practice (steps 3 and 4)

It is possible to think about Steps 1 and 2 as related to the pre-service teachers and Steps 3 and 4 as a translation of their practice. From the course evaluations it is not possible for the students to assess how this one course impacted the quality of their teaching practice – they were not yet *practicing*. To gauge impact in this area, a series of interviews were held in early 2017 with former course takers. Two students from each course year were randomly selected. Fourteen responded and agreed to participate; seven were interviewed by phone, six by email, and one in person. Each interviewee was employed as a teacher at the time of the interview and was asked to discuss whether they used concepts and materials from the course with their students and how this course fit within their overall teacher preparation program. The respondents represented teaching in grades 6–12, and courses in world history, South Carolina history, geography, economics, and science. Their teaching tenure ranged from one to eleven years.

Table 4 presents results from the interviews. When asked whether they used any concepts taught in the course in their own teaching, 100% responded affirmatively. They spoke of map literacy, weather and climate, and migration push and pull factors (among others), and how they could not "do geography as just knowing locations" (a move away from the information-orientation described by Bourke & Lidstone, 2015). Nearly all used materials

Table 4. Post-course interview results with practicing teachers.

Select questions	Result
Do you use any of the concepts taught in this course in your own teaching?	Yes, 14 of 14
Do you use any of the materials given to you in your own teaching?	Yes, 12 of 14
Have you participated in any geography professional development since taking the course?	Yes, 11 of 14
Compared to your other education courses, would you say that this class was "Less Useful", "Equally Useful", or "More Useful" as a new teacher?	"More Useful", 14 of 14

given to them during the course to include lesson plans, maps, and posters, although two did admit to primarily using maps as wall art as opposed to as an instructional resource. Eleven of the group indicated that they continued to learn themselves by participating in geography professional development hosted by their school, district, or state geographic alliance.

For the purposes of understanding the benefits of this course to their development as practicing teachers, the final question deserves more exploration. When asked to rate this course as "Less Useful", "Equally Useful", or "More Useful" as compared to other coursework in their education program, the responses were unanimous: "More Useful". When asked why, the common theme was *practicality*. For example:

> This course is what a masters level course should be; everything was applicable in the classroom; not just pedagogy, but being told why things are being done; I felt like this was stuff I could use; more practical and less theory, with lots of lesson strategies, and very adaptable. (2016)

> Most of other education classes were theory for the ideal classroom; this class contained concepts about differentiated instruction and showcased lessons and resources that we will actually use as opposed to a utopian classroom that does not exist. (2014)

> Compared to my other education courses, I found this one very practically useful. I found [the] strategy of having us learn material in the same way our future students would learn it very helpful in forming my own teaching strategies. I found that I was later able to reflect on my own learning style and methods and use this knowledge to create lessons in the future. Often with my other education courses there was a lot of "book knowledge" we were lectured on, and then later experienced as student teachers. With [this course], the "book knowledge" and practical aspects were combined into [the] classroom experience. I generally left each day's class understanding how I would use the material and ideas … in my future classroom. (2011)

By mapping, reading, going outside, using technology, actually going over impactful lessons, these now-teaching professionals saw the course as integrative and engaging, leading one to express that she felt that she "can teach, even if just a little bit, more than just places on a map". One even suggested that her explanation of the course during an interview helped her to land her first teaching job.

Feedback on course mechanics

This section returns to the results of the end of course evaluations. While as geography educators it may appear that *Course Content* should take primacy, it is a mistake to let the process by which we teach and interact with these pre-service teachers appear less important. "Clearly stating the instructional objectives", "Returning work in a timely manner", "Presenting an organized course": observing each of these items is more than extending courtesy. We must remember that in this type of course, perhaps more than any other, we are constantly *modeling* (see Bourke & Lidstone, 2015). What we hope to see in the

future classrooms of these pre-service teachers – organization, writing well, promptness, and respect for other opinions – must be cultivated by example. Table 3 shows that, like the *Course Content* scores, course mechanics are consistently rated highly (4.78–4.95/5.0 range over the five questions) and are above the average for other courses taught in the geography department.

Continuing to model for these students, four other beliefs are worth further consideration. First, *firmness*. Establish upfront what is fixed, settled, and unalterable. For example, this may be a firm belief that students should be able to express their ideas in writing, and to do so well. This is not negotiable. This is an example that crosses disciplinary areas, but each of us must determine what is central to what we do. But life happens. Being firm does not limit one's ability to have compassion or to be adaptable when the situation demands it. *Flexibility* with your students is necessary. Each of us will draw that line differently – perhaps based upon the student's culpability in creating the particular state of affairs – and hopefully that decision will be rendered *fairly*. Finally, students are owed something of substance. Students do want to learn, and we provide that entry point. But there is something else, too, here. They want to have *fun*. Dispensed in equal measure, this can be quite powerful to learning and very motivating. Without playfulness in the endeavor, much goes missing.

Student comments reflect how they, too, value these traits:

> I really loved his method of teaching and how he constantly brought real world examples into the classroom. He was extremely organized and we knew what to expect. This course was excellent and made me recognize the importance of geography. (2009)

> The instructor achieved a very tough goal – effectively teaching how to teach – with aplomb. Great use of contemporary events, real life examples, and humor. Additionally, he provided valuable advice, classroom supplies, and a (hopefully) perpetual contact for future contact about unforeseen issues. Lastly, he learned everyone's name and turned back graded work in an expeditious fashion. Overall, an interesting course taught by a phenomenal instructor. (2015)

Opportunities for improvement

Twelve years of experience and the student responses to the question "what are the weak points of the course/instructor?" have been used to refine portions of this course. Three issues stand out, both directly from the students and from personal observation.

Outside of general grumbling about tests, taking off too many points for grammatical errors, and so forth, the following comment (among a few similar ones) prompted a major structural change in the course:

> I don't know if the tests were very fair. I felt I learned a lot from lecture, but we didn't discuss the book in class. So I had problems understanding the book that translated poorly on tests. (2011)

This suggests a desire for more engagement with all course materials. Texts were generally treated as supplemental, but are now considered an integral part of the course. The panel discussions introduced are a direct result, and the course is now "hybridized" – a blend of both lecture and seminar-like elements. This innovation, however, comes at the expense of class time previously devoted to lesson development and geography content delivery.

The lesson development portion of the course is important first to provide practice in considering the many elements that go into successful instruction. While the focus here is on geography, and thus in many cases on more active-learning strategies in lesson development,

the basics such as writing clear objectives, procedures, and assessments are universal in many ways. Still the following points to a longing for more help:

> I have never done a lesson plan before and was kind of lost during the process. I did go ask questions about this assignment, but more guidance or instruction would be more beneficial in the end since this is a semester long assignment. (2014)

Now instituted throughout the semester are a series assignments to guide the process: first the general topic and the standards met, then the objectives, later an overview or abstract, and so forth. Each assignment is returned with comments for improvement and each student is invited outside of class for personal one-on-one time to go over each element to produce a complete and teachable lesson.

Considering different teaching strategies and lesson development ideas is ideally meant to showcase how to do so successfully with geography content, but another imperative has appeared, to wit:

> We wish he was more involved in the education of new teachers. Again, we've learned more about teaching practices and methods and resources from him than ANY of the professors in [the education department]. (2014)

> Best class I have ever taken, and one of the only classes that has actually prepared me to become a teacher. I really appreciate all of your hard work, all the resources you have given the class over the semester, and your sincerity to want the class to succeed as educators. (2015)

Students routinely express frustration that they are not receiving this type of instruction in their traditional education courses. This creates a constant tension between the "geography" and "education" elements of the course. To some extent this burden should not fall on this course any more than teaching grammar or other fundamentals, but if the goal is create great teachers – geography or not – more collaboration between academic units and disciplinary areas is required. The earlier mentioned overview article by Bednarz and Bednarz (1995, pp. 484–485) included the recommendation to

> encourage interaction between geographers and College of Education faculty. Address the question, 'how can geographers put appropriate geography content in the hands of education faculty and the teachers responsible for supervising student teaching?' We should add to this directive 'How can College of Education faculty put appropriate pedagogic strategies in the hands of pre-service students before they engage with education-related coursework outside the college?'

The problem here – at least at this institution – has been twofold. First has been turnover in the Education faculty. Building rapport and trust around common issues between different academic units takes time and a consistent set of players. But most important, the second concern has been relaying the importance of the common issue – geography education – when Education faculty themselves have little or no background in the discipline. Education faculty tend to be drawn from the teacher corps. After time spent in the classroom, they enter graduate study and ultimately the professoriate. When they themselves have had little geography in their training programs when they were students, making the case that geography is important for their current students can be difficult.

Further engagement with the College of Education is needed on another point: there is no prerequisite for this course nor is there an approved sequencing related to other education courses. Student comments bear this out:

> The MAT [Master of Arts in Teaching] program needs a sequence so that students can have appropriate instruction before being asked to exhibit knowledge. (2015)

> This class was about teaching geography. I definitely learned how to teach geography, but I think I would have benefitted from this class more if I knew anything about geography before coming to this class. (2014)

Not all students share these sentiments –

> I came into the course as a mostly blank slate when it came to geography. Now, not only do I have a thorough understanding of the course, I also feel confident that I can teach geography and utilize available technologies to do so. (2014)

– but where possible, coordination among academic units would ideally have students taking an introductory level geography course and basic education methods coursework prior to enrolling in this course.

Conclusion

This article began by reiterating the call for improved pre-service teacher education as voiced by others (Bednarz & Bednarz, 1995; Bednarz et al., 2004; Boehm et al., 1994; Gilsbach, 1997; Havill et al., 1994). But where to start? This paper has shared one model for teaching a geography education methods course for pre-service teachers as a potential answer. Knowing the subject is not enough (Brooks, 2011). The task is indeed large: ensuring geography subject matter *and* pedagogical strategies are taught across a wide range of teaching levels and other content areas (e.g. to comport well with Common Core ELA (2010) and C3 (2013) frameworks). These areas include both the physical and social sciences, literacy (reading), mapping, technology use, visual and kinesthetic strategies, and lesson development, with the goal of enhancing the students' future instruction regardless of their ultimate subject area of focus.

In the course model described here, student conceptualizations of geography are refined, leading to a more positive view of the subject as a whole and its potential for inclusion with other content areas. Geography as a discipline is shown to have different perspectives (spatial, ecological: Heffron and Downs [2012]; local, international: Gersmehl [2014]), and also a specific way of thinking (geographical and inquiry-based). The end of course evaluation data strongly suggest that enhanced student learning and critical thinking are positive outcomes and that the course structure allows them to see good geography teaching in action. The post-course interviews with the now practicing teachers highlight the successes of the course long-term – that this course has had a positive impact on the teaching of geography. These successes notwithstanding, future work should include increased collaboration with the College of Education for more appropriate course sequencing and sharing practical strategies for improving lesson development.

In all, the overall positive outcomes of the course demonstrate the possibilities when geography educators work to change "pre-service teachers' conception of geography from a narrow information-oriented view" and, as noted earlier, professors "model and teach with passion, innovation, and creativity … to develop the capacity of pre-service teachers to be competent, critical, and creative users of the inquiry method …" (Bourke & Lidstone, 2015, pp. 10–11). The process is not easy, but the rewards are there:

> I found this course to be more difficult than those I have taken in the past but I definitely feel it was beneficial. This class is great for preservice teachers. [He] showed us so many different ways to incorporate Geography into the classroom regardless of the subject. This class was very

> hands-on which was nice because I believe I will feel more comfortable teaching my students the things I learned in this class because I have already done it myself before. (2013)

While this particular course has been fashioned to meet some very specific local needs, the deficit of time dedicated to preparing geography teachers elsewhere is not unique. As such, this article concludes with the hope that the model shown for *Contemporary Issues in Geography Education* can help other like-minded educators successfully pull together a similar education experience for their own pre-service students.

Note

1. There are other literacies (numeracy, map literacy, technology), but the focus here was specific to reading and written text.

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