

UW Academic Challenge and Engagement Study (UW ACES):

Geography

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INTRODUCTION

Research on learning in college shows that learning is profoundly shaped by the goals, practices, cultures, and values of the academic disciplines¹, particularly the disciplinary practices in students' majors. Therefore, if we are to understand the kinds of experiences that students find intellectually rigorous (and, thus, engaging), we need to examine challenge in the major. Understanding challenge in the major is important because at every stage of their college experience, students report that they want to be challenged, that they perform better in courses that are challenging, and that they value classes that stretch their thinking and ask them to demonstrate learning more than they value classes that ask little of them.² Although learning about where students experience challenge is important, asking students to describe challenging learning experiences in their majors requires some prior understanding of how those majors operate. The Office of Educational Assessment (OEA) designed the UW Academic Challenge and Engagement Study (UW ACES) to accommodate these needs.

METHOD

Qualitative methods are recommended when researchers are seeking to understand the complex learning experiences of students, as well as the meaning of those experiences³; therefore, we designed the UW ACES to be primarily an interview study.⁴ Using a "citizen science" model, OEA asked departmental advisers if they would be willing to volunteer to interview seniors in their departments who came in to advising to apply for graduation. Advisers are knowledgeable about their academic programs, understand disciplinary practice in their departments, and are trusted by students in the major, so they have the best chance of gathering good information from seniors about their experiences in the major.

Sixty-six advisers from 32 undergraduate programs volunteered to participate. During the 2012-13 academic year, the volunteer advisers asked students if they would participate in brief (5-10 minute) interviews about challenge in the major. If the students agreed, advisers asked them to respond to four open-ended questions, entering students' responses directly into a Catalyst survey form that OEA researchers had designed for that purpose. The questions were as follows:

¹ Beecher & Trowler, 2001; Bransford et al., 2000; Beyer et al., 2007; Donald, 2002; Pace and Middendorf, 2004; Wineburg, 2001, 1991; Neumann et al., 2002; Shulman, 1988; Biglan, 1973.

² Beyer, et al., 2007.

³ Merriam, 2001.

⁴ One participating department asked students to respond to the open-ended questions in writing.

1. What do you consider to be the most challenging work that you had to complete in this major? And by "challenging" I mean doing the work that stretched your thinking the most. This can be anything—a project, a paper, an exam question, homework, something else you did related to the major.
2. What made the project/class/activity challenging?
3. What did you do or learn that enabled you to meet those challenges?
4. What do you think you learned by completing this project/class/activity?

In addition, advisers asked students in what course the challenging work took place and how many quarters they had until they graduated.

Researchers in OEA conducted training workshops in interviewing skills with all participating advisers, provided individual departments with survey customization if required, and monitored all resulting interviews, reporting back to advisers about the interviews they had conducted. By the end of the academic year, departmental advisers had interviewed 1,237 students.

Students' responses were analyzed using a constant comparison method⁵, an inductive process designed to let themes emerge, rather than imposing assumed categories of response on students' comments.

STUDY LIMITATIONS

If we interviewed students post-graduation, they would be likely to identify their capstone courses or their advanced senior-level courses as the ones asking for their most challenging work. However, because we wanted to attach the interview to a time when students would normally see their academic advisers, we interviewed students when they came into the advising office to apply for graduation, which often meant that they were two or three quarters away from graduation. Although this approach meant that we might not gather information about late-senior year courses, we felt that it would be interesting to departments to learn the kinds of challenges that lead to and prepare students for those more advanced experiences.

GEOGRAPHY RESULTS

The Geography Department was one of the UW ACES' participating departments. Richard Roth and the academic adviser in Geography invited 54 students who were applying for graduation to participate in the interview study, and one declined. The 53 students who provided interviews represent about 52% of the 102 Geography seniors who graduated during the 2012-2013 school year.⁶

Regarding the tracks through the major that students were pursuing or considering pursuing, the following responses show that 72% of the senior interviewees were concentrated in two of the four tracks:

- 4 (8%) identified "Globalization, Health and Development"
- 5 (9%) did not provide a track
- 6 (11%) identified "Cities, Citizenship and Migration"

⁵ Merriam, 2001.

⁶ The number of undergraduate degree completions is based on the 2012-13 UW Profiles reports published by the UW Office of Planning and Budgeting (https://bitools.uw.edu/views/13-SummaryandTrendsDegreeAttributes_0/13-Dashboard#1).

- 18 (34%) identified “Environment, Economy and Sustainability”
- 20 (38%) identified “GIS, Mapping and Society”

Quarters to Graduation and Where Students Experienced Challenge

Most of the students interviewed had two quarters (24, 45%) or three quarters (22, 42%) left before they graduated, including the quarter in which they were interviewed. Seven (13%) were in their final quarter before graduation.

When asked which courses in the major had presented them with the greatest challenges, students listed a total of 21 courses in the major, with some students noting more than one course. In addition, two students said that experiences that included study abroad had presented the greatest challenges. The courses that Geography majors listed as presenting the most challenges were spread out across the Geography curriculum, with 100- and 200-level courses mentioned seven times; courses at the 300 level identified 29 times; and 400-level courses noted 18 times. This spread suggests that the curriculum provides challenges across the major, but, interestingly, close to a third (32%) of those interviewed identified Geography 315 as their most challenging class. In general, that more 300-level courses than 400-courses were mentioned likely speaks to where interviewees were in their academic programs—with 42% having close to a full academic year to complete.

The list of Geography courses and the number of students who mentioned them (number given in parentheses if more than one student mentioned the course) were as follows:

Geog 123 (2)	Geog 461
Geog 180 (2)	Geog 426
Geog 205Geog 270	Geog 440
Geog 280	Geog 445 (2)
Geog 315 (17)	Geog 471 (2)
Geog 326	Geog 478 (3)
Geog 331 (5)	Geog 482 (2)
Geog 349	Geog 490 (4)
Geog 360 (4)	Geog 496
Geog 381	Geog 499--independent study

1. Students’ Greatest Challenges

Students were asked: *“What do you consider to be the most challenging work that you had to complete in this major? And by “challenging” I mean doing the work that stretched your thinking the most. This can be anything—a project, a paper, an exam question, homework, something else you did related to the major.”*

In speaking about their most challenging work, one strong theme and several minor themes emerged from their responses. These themes were not linked with specific tracks in the major; rather, they were identified by students in all tracks.

A project required by a course. Thirty (57%) of the 53 interviewees mentioned a project in the major that they were required to complete in a course (frequently Geography 315). Sometimes the project

involved several components, such as research, a written document, working in groups, and/or a presentation. The following examples illustrate this theme:

- *A project for Geography 426 comparing multiple regression and regular regression and a geographically weighted regression*
- *Global Poverty and Care class—a service learning project that culminated in a final paper*
- *It was in my geography of housing, 445. It was challenging because usually you have specific assignments with particular guidelines, but for the final assignment, it was up to us to think of basically a question that had to do with the spatial housing market of the Seattle area, and, basically on our own, make our analysis, write a report, and present to the class. At first thought, I had freedom. But it's challenging to make a thorough project using GIS when you have that freedom. It was by far the most challenging thing.*
- *The Geography 315 project to design a research project. In hindsight, there's no better way to do it, but, boy, was it tough at first!*

Papers or the writing required. Nine (17%) of the interviewees mentioned a paper they had written or the writing assigned in a class as their most challenging work. Obviously, this category of response overlaps with the previous category, as many of the projects students spoke about were papers. However, when students specifically identified the written work, we counted that separately. The following examples illustrate this category of response:

- *The research papers in Geography 440*
- *The final paper in Geography 315*
- *Geography 123 research paper—research a transnational corporation, across the whole world.*
- *Doing lit reviews because you're not usually exposed to a formalized way to do them, so you assume a summary is the same as a critical review. It's not. You need to know the methodology behind it.*

Specific courses. Six of the seniors who were interviewed mentioned a specific course or courses as the most challenging thing they had done in the major. For example:

- *Probably 315 as a whole was pretty in depth because it brought out lots of different—not topics, but you could say that—that I haven't really understood before. It looked at geography as one holistic thing instead of focusing on a single thing. I really liked the course.*
- *I thought the health courses in Geography really challenged my thinking because it's not something I'm really interested in, but the other students in the class were more accustomed to do that kind of work. They had a passion for it. So the health classes definitely presented a challenge in terms of how to approach the work.*
- *Geography 360 was challenging because on the very first assignment you had to decide which kind of map best answered the question.*

Other. In addition to these categories of response, the following challenges were mentioned by two or three interviewees:

- The service learning component to a class

- Experience that included study abroad
- Use of quantitative methods
- The reading required

2. What Made Those Activities/Classes Challenging?

Next, students were asked to note what it was about the activity or the class they had described that made it especially challenging. The majority (66%) of the Geography students interviewed identified more than one aspect of the activity or class they had mentioned that made it challenging. Furthermore, more than three out of every four (77%) challenges that students mentioned were connected with research. Often students mentioned several aspects of the research process that were challenging. The following two quotations illustrate this range:

- *The Geography 315 project to design a research project [was the most challenging thing I did in the major]. In hindsight, there was no better way to do it, but, boy, was it tough at first. Going from phase to phase was like flailing blindly into the wind because we had to set up a research project even though we didn't know anything about the subject. We had to do a lit review to find gaps in the knowledge, but since we didn't know what we didn't know, we were answering an unknown question without knowing anything. We also had to be innovative. So I was overwhelmed from day to day, wasn't sure where the project was going—the lit review, designing a research question, identifying a gap in the literature, designing a project, steps on how to solve our question and how we'd complete the research. We had to consider evidence and methods (surveys, stats, etc.) used to answer questions, and had to sort of operationalize one method. I used an archival research method to analyze the new sports stadium in downtown Seattle.*
- *[Professor X's] 490 class fits into one of the most challenging classes because the class is structured around a research project carried out throughout the quarter, I wouldn't necessarily say one aspect was more difficult than the other, but developing the methodology, asking a research question, and carrying out the research was extremely challenging and very rewarding. I put more effort into that project than any other research project I've done. I think, again, by virtue of the design, the expectation was for a fully-fledged research project, and there wasn't any coddling or down playing it. There wasn't any dumbing it down for students. [The assignment was to] produce a research project about a neighborhood in Seattle, and that expectation in a no-nonsense way was challenging but also very exciting. You were doing it all yourself. It was inductive too, in that we were asked to choose a neighborhood and determine a social issue in that neighborhood. That was a rewarding process of working through induction and not coming up with presumptions.*

Four strong themes and two minor themes emerged from students' responses, all but one of them specifically related to research.

Thinking critically. About 28% of the interviewees mentioned critical thinking when asked about what had made the classes and projects they described challenging. Students spoke of many critical thinking challenges, such as thinking critically about articles they were reading, about the service learning site

they were involved with, about research methods, and about their own assumptions and motivations. The following examples illustrate this category of response:

- *I worked with New Futures—they do afterschool programs, skill training for migrant families, generally helping migrants get used to school, work, etc. The paper didn't have to be a critique in the sense of being critical, but it had to be a critical evaluation of how they were meeting their mission and who was working there. It was hard to get under the surface because I already knew the coordinator there for two years and had to question what she was doing—the actual care work they did. It wasn't anything I'd ever thought about before. Most organizations you don't really question what they're doing.*
- *Reading critically—not just understand but go beyond. Figure out what they're trying to say, and how my ideas should go with their ideas, and show evidence and argue about it. Fit my argument into their writings. Try to support theirs but also use my own voice.*
- *The format of 315 was great. It made me really question what it was that I was asking and investigating about geography. I didn't only learn techniques for research, but for asking “what am I doing.” It really jumpstarted my career in geography—food and economic interest. I wish I had taken it earlier*
- *It made you think about other people, like understand what people are going through—compassion, sympathy. We watched a video about how people are struggling every day for less than minimum wage, how my parents as Vietnamese immigrants went through the same situation, and how that makes me want to make a change for the better. The readings made my really think about life and inequality.*
- *It provoked me to think critically about global health and the global care chain—outside the U.S. The Global Care Chain—the Philippines is known for nurses, but it's actually detrimental to their country. Even though it helps the U.S. labor supply, it diminished the Philippine's ability to create an economy.*

Creating my own topic or research question/working on my own. A second theme, also identified by 28% of the interviewees, was the challenge of creating their own questions or topics for a research project. Four of these students also noted the challenge in being in full charge of the project. The following quotations are examples of this theme:

- *We weren't given a topic. We had to create our own and come up with our own project. I never experienced that before—first coming up with a topic, narrowing the options, and finding one you can actually research. Usually you just get a topic and you can write on it. Also, the literature review is going to be really hard because we have to find the right sources and then write about them. They have to fit you topic and it's hard to narrow and then you keep finding even more interesting things but have to keep your focus.*
- *The task of having to create was overwhelming, creating some new useful piece of information that someone would be able to use or find interesting. A lot of what we learn is just told to us—there's a lot of memorization, and so the degree is about listening and parroting back—but in this course we had to produce something*

substantial, something original, something that not simply asked us to use what we already had been taught. [We had to create] a new analytical path.

- *In Geography 360 and other classes, you have a step-by-step guideline. Here, the sole reason why it was so difficult was because you're given the freedom to do anything you want. That's why it's so challenging.*
- *I looked at how the middle class is shrinking and becoming more polarized from the lower classes. I looked at the five boroughs in NYC and how household incomes are getting increasingly separate, how the gap between rich and poor is widening. I'd never used any methods to help analyze those kinds of statistics before, mostly I had just found the statistics, but in this course I had to generate my own stats, using a particular method. I also had to narrow the topic to be able to research it and analyze it. It took me a few weeks of kind of wandering around through various topics before I narrowed it to something that would get me somewhere. I hadn't ever come up with anything like that before —devising the whole project. It completely depended on self-motivation.*

Conducting the literature review and identifying the right sources. Ten (19%) of the interviewees spoke of conducting a review of the literature on their topics or finding good research articles for their topics as the most challenging part of their most challenging experiences. Nine of the 10 students were speaking of work they did in Geography 315—about half the number (17) who identified Geography 315 as their most challenging experience in the major. These students were spread across the concentrations offered by the department. This result suggests that the literature review part of Geography 315 is a significant challenge for many students in the major. Students noted a range of challenges in conducting the literature review, as the following examples show:

- *This was my first time to write a lit review and it was 10-20 pages and that was a challenge because I didn't know how to expand my thoughts. My topic was economic trading relations between China and the U.S., and at first that seemed easy but it was hard to find some useful articles to support my ideas. It was easy to find sources, but not so easy to find those that supported my ideas. I had to both broaden my search and ultimately narrow my ideas.*
- *I didn't know the difference between just proposing something and writing an actual research proposal. I wasn't prepared for the kind of frequent critiquing we got step-by-step—the way they challenged my writing and my logic. I learned that I had to both choose a methodology and justify it, and match it to my literature search, which was another thing I learned in there because it's more than just some quick summaries.*
- *Synthesizing 10 scholarly articles and coming up with the right sources [was the most challenging thing I did]. By synthesizing, I mean finding some common threads or hooks and getting them into some kind of communication with each other. The "right" sources were peer-reviewed articles that were especially relevant to my topic. Mine was border security, what constitutes the formation of borders, and I went into details about the type of technologies used and how those technologies infringe on people's rights. It was also a challenge because each article was 20 pages or so and written in academic language. I had to see the main arguments and how the articles fit together.*

Identifying the best research methods to use for geography. The fourth theme, identified by nine (17%) of the interviewees, was the challenge of figuring out what the best research methods were for the project at hand. For example:

- *The research proposal [was the most challenging]. I hadn't done it before. It was difficult because I had to figure out the research methods—the question, where and how to gather data, would the data be applicable and acceptable, whether to use a survey or statistical method or whatever, what we'd be looking at and why.*
- *That you have to be creative and attentive to social issues and concerns and you have to design the whole project yourself and come up with all the data yourself.*
- *It was kind of general in a geography sense. It wasn't zoomed in on a specific topic. It focused on geography as a whole and how to approach geographical research.*

In addition to these four themes, two minor themes emerged from students' responses.

Thinking in a different way. Six (11%) of the interviewees said that the challenge in their most challenging work in the major was that they were required to use a different kind of thinking. Five of the six were in the GIS, Mapping, and Society track in the major, which means that about 25% of the interviewees in the GIS, Mapping, and Society track identified a new way of thinking in the major as especially challenging. In the words of three of the students whose responses created this theme:

- *It's a different way of thinking. It uses social science words (nomothetic, inductive, deductive) and trying to fit something real life into that. I'm struggling with that bit. It's also very applicable, though, so I guess it's worth it. Research isn't easy. I'm working on human trafficking. It turns out there's a big a gap when it comes to talking about men in trafficking. I'm concentrating on men moving from Mexico to the U.S.—the drug trade comes into it also. Fitting that social phenomenon into the social science verbiage and way of thinking is the hard part.*
- *High school and college are very different. Geography is not just maps. I learned about human geographies and applying concepts of inequality to a housing issue, and using a map helped uncover a lot. It changed my perceptions—seeing the patterns really helped me understand where and when the inequality developed. That leads to the why.*
- *It was a progressive learning challenge and a whole new systematic way of thinking, so if you stumble at the start, it's hard to continue and get your footing.*

Synthesizing/putting all the pieces together. Four (8%) students spoke of the challenge of synthesizing research, class concepts, and ideas. The following two examples illustrate this theme:

- *Synthesizing every aspect of research, from online journals to maps to GIS, statistics. Looking at various different methods of research and work to complete the project, and not just being able to Google answers. I did mine on GMO corn and looked at stats about corn from the U.S., Africa, etc., and read a lot of scholarly article about genetic makeup, trade patterns, different companies and what they're doing, how they're trading it, processing it into high fructose corn syrup, feeding it to livestock, seeing the food it's going into. There are a lot of pieces to put together*

- *It was taking the concepts from a class and applying them to real field research conducted using a variety of methods, both qualitative and quantitative. I hadn't learned how to use those methods before I had to do them, so it was a learning process. Also, I had to engage that research with the literature that existed—statistical survey data, personal interviews, participant observation, the care ethical literature, ethical ways that outsiders engage with others. I had to be thinking about cultural insiders and outsiders and how we navigate our positions in the world as privileged white Americans.*

Other. Finally, two or three students identified the following as challenging aspects of their most challenging work:

- Course content or service learning was “eye-opening”
- The quantitative/statistical aspects of the work
- The course material made students think empathetically about inequality
- Interviewing people/strangers
- Meeting the criteria for each section of the research proposal
- Understanding academic language in geography/research
- Coursework/project involved understanding complex programming assignments
- Finding and analyzing information
- Determining if a research idea is feasible
- Linking theory to the research question/data
- "Fitting my argument into their writings"

3. What enabled or helped students to meet those challenges?

Two very strong themes emerged from students' answers to this question, along with several minor themes.

The instructors. The most frequently given response to the question of what enabled or helped students meet the challenges they had described were the course professors and TAs. About 40% of the interviewees said that their instructors had helped them complete the challenging work they had described. For example:

- *The course was set up in stages—the literature review, then methods, then pick a topic, then built it all up and put it all together at the end. The professor and TA helped me a lot with drafts, critiques, one-on-one sessions. That all helped me figure out what I was trying to get at*
- *I really really give Professor X credit for people's success in the course, because he was really attentive to students. We could ask the same question over and over, but he would answer it every time. He was so patient with us. And here we are juniors and seniors—we should get it. He's one of the best instructors I've ever had here. Probably the best.*
- *I talked with the TA a lot. She helped by answering my questions, giving me good sources and hooking me up with instructors at other universities, so I was able to narrow it down, but I had to use fewer ideas.*

- *Talking a lot with the TA and instructor and going over my work piece-by-piece to make it all fit together better. I almost dropped the course, and even the major, because this was so hard for me, but I managed to pull through*
- *I talked with professor about questions and the formulas, and he tried to help me understand. I now understand the concepts behind it—how you need to think about what works in a certain kind of setting or question.*
- *Looking for census data and working with the TA and professor. I asked them about the different kinds of census, and they helped me differentiate between the maps and compare them, so I could pick and choose features from different maps.*

Previous courses or course material in the major. Fifteen (28%) interviewees said that they were able to meet the challenges required by their most challenging work because of work they had done in previous courses, concepts they had learned, and tools they had used in the major. The following quotations illustrate this category of response:

- *Taking Geography 326 (stats), we were given a topic and did the basic research, so I saw the other side—where it was all kind of cut and dried. Then, I had an example of how to conduct research and write a proposal.*
- *The overall message in all our classes of being critical, asking questions, not assuming anything beforehand—just approaching things skeptically.*
- *I learned from being a part of the classes to flip everything on its head. What you assume about the place is never what it is after you've lived around them. I learned patience and communication and the value of body language, smiling—not necessarily classroom skills—the process of being humble. Things aren't always in your hands. I saw some horrible things but tried to put them in perspective. Professor X's 331, Geographies of Care, was a great class for me because it also shattered assumptions of poverty and care. I thought we would talk about Africa, but we talked about the U.S. That shattered my assumption. Professor Y's 315 has been good now, since it reinforces what I did in India from a literature perspective. It contextualizes what I did in an academic sense. It is easy for me to relate my experience with Professor Y's description of research.*
- *I haven't met the challenge yet, but my geography courses have set up the concepts and theories. The Gender in Geography course establishes why men are left out of this literature and even the mapping courses apply in the same manner because they all give you a more holistic view of how things work. It's all interconnected*
- *I would say Dr. X and Dr. Y and the actual specific work with ArcMap that helped me get familiarized with the tools for analyses. But 315, that one really makes you think about the concepts and geographical theories that are out there. And now it's an ongoing process. I'm taking 462, and Professor Z really makes you think about all the concepts as a whole and how they fit together.*

In addition to these major themes, two small themes emerged from students' responses to the question of what enabled them to meet the challenges they experienced.

My own efforts in the class. Six (11%) students said that their own efforts helped them meet the challenges of their most challenging work. Students spoke of putting out more effort, being more organized, doing all the work and reading assigned, conducting extra research on their own, and other approaches to staying on track and doing well. In the words of two of those students:

- *I did more research on poverty—not many people know about how widespread it is both in terms of absolute numbers and regional distribution—and the growing gap between higher and lower classes.*
- *Organization as a study skill. I had to make it a priority, go to class, do the reading. [I thought about] how I can apply myself and make a good effort.*

Collaboration and discussions with peers. Four (8%) students spoke of collaboration and their interactions with peers as helping them meet the challenges presented to them in their most challenging courses and projects. As one of those students put it:

Talked to a lot of classmates. It was a small class and workshopping ideas between other students and the instructor opened things up for me. Everyone was more in tune with homeless help programs around the city, so they taught me a lot about the political structure in Seattle and what was really going on—the nature of exclusion, questions of social control, and human rights and so on.

Other. In addition to these themes identifying what helped or enabled students to meet the challenges they had described in their most challenging assignments and classes, more than one student reported the following as helpful:

- Stayed open-minded/examined own thinking.
- Drilled down deeper into the material
- Trial and error
- UW librarians
- The progressive, step-by-step structure of the course

4. What did students learn by completing this project/class/activity?

Finally, we asked students what they believed they had learned by completing the challenge they had described. Several themes emerged from their responses.

How to do research. Close to a third of the students interviewed (32%) said that they learned to do research as a result of completing the challenging work they described. Most of those students (14 of the 17) were speaking of what they learned by completing work for Geography 315. The following examples illustrate this category of response:

- *How to research using different methods, following a project from start to finish and coming across gaps and not just leaving them as gaps but going beyond what you find on the internet and beyond the obvious articles and getting deeper into the gaps and trying to fill in those gaps. Like a company's gaps. Like an article about a company using corn and researching that company and figuring out their tax reports, income statements, etc. I like doing this kind of thing because I feel more in control of the outcome and am not just summarizing stuff.*

- *How to design a research project. That should really help me get a job in the future or design my own research project. I know more now about all of that than I did coming in.*
- *How to put together a real research proposal, especially figuring out what hasn't yet been looked at or only looked at in a superficial or indirect way. This is a lot different way of thinking about scholarship than just summarizing what a bunch of people have already said. You need your own angle.*

How to use geographical tools, information, and approaches. A second theme, mentioned by nine (17%) of the interviewees, was that they had learned to use tools, information, and approaches appropriate for their discipline. The tools and approaches students mentioned varied quite a bit from one student to the next. For example:

- *How to identify the key components of geography as a discipline. I call it spatial analysis with a critical slant.*
- *To use spatial methods and a GIS system, and how to take residuals from SPSS and map those residuals and compare the results.*
- *With ArcMap and GIS tools, there is nothing you can't, on some scale, analyze.*
- *The combinations of coloring and placement are key to how people comprehend maps, and you have to bring every detail together to create the right impression*
- *The value of transport and closeness of space. It's something that applies to info tech as well—especially once you appreciate the cost of physically moving something, as opposed to just moving info digitally. I also learned how important specialization is in the global economy, how you can find areas of the world or factory towns that specialize in a particular unit or a part of the whole, how interconnected they are.*

The connection between the academic world and the world of work outside the academy/my future direction. When asked what they had learned from the challenging work they described, eight (15%) students said that they had learned something about the connection between the world of academia and the world outside it. Several of those students noted that in that learning, they had also learned about their own future direction. The following quotations illustrate this category of response:

- *That there's more connection between the academic and the real world than meets the eye. Engaging with this work at this academic level made me do the academic work—use the thought tools, such as thinking about care ethics and relational poverty. These were new concepts to me, and I could see immediately how related they were to the work of USAS. I learned some new ways of perceiving and justifying my commitment.*
- *Apply the classroom to the world. What does research really mean? Research is talking to people, seeing how they live. It's very applicable.*
- *There's so much here in Seattle—urban justice issues. Seattle has things to look at, study, be part of, be involved with as a geographer.*
- *How to apply this to real life—like use it for real life.*

How to write. Four (8%) students said that they learned to write by meeting the challenges presented in their most challenging work. In the words of two of those students:

- *How to write a critical paper and a research paper. You need evidence plus analyzing what the article is trying to say in the context of your own subject. You need to find gaps in the research and make a new argument. For transnational corporations, I've had to sort through 10 articles and find the gaps to make my own argument. It's not easy to see what isn't there.*
- *To know how to write a report.*

How to think critically in the discipline. Finally, four (8%) students also noted that their most challenging work had taught them to think critically. For example:

- *How to link location and numbers. How to do in-depth analysis. It helped me in lots of other classes, laid foundations for other major research paper you had to do.*
- *That the whole methods thing works. It's not just human or physical geography, with facts just given to you, but doing an analysis of the facts and maybe coming up with some new facts. I could see the different layers and procedures that were involved. I also learned how to separate the good sources from the bad ones, how to read academic articles, and how to see the really important difference between quantitative and qualitative analysis.*

SUMMARY

In speaking of their most challenging work in the major, seniors in Geography focused on the challenges presented by research in the discipline, as the two examples at the end of this section illustrate. Indeed, three out of every four interviewees mentioned one or more aspects of research as their most significant challenges in the major. In addition, close to a third of the students mentioned the specific challenges presented by the work assigned in Geography 315, a required research methods course, which suggests that this class is a powerful learning experience in itself and that it also prepares students for what follows in their coursework. Students also mentioned research challenges in their 400-level courses.

In terms of research challenges, students spoke of the challenges in thinking critically, coming up with their own research questions and topics, conducting the literature review, and other aspects of research as especially challenging. Regarding what helped them meet the challenges they described, students gave primary credit to their instructors—both professors and TAs—and to the previous courses they had taken in the major. Finally, when asked what they had learned by completing the challenges they had described, most students said they had learned how to do research, how to use geographical tools and ideas, and how to connect the academic world to the world outside the classroom.

Students' differing tracks in the major did not seem to affect their responses, with the exception being that most of the students who identified "thinking in a different way" as a challenge were in the GIS, Mapping, and Society track. Other responses were spread across the four tracks in the major.

Recently, the Geography Department conducted two workshops to explore the possibility of designating some of the 400-level courses offered by the major as capstones or capstone-like experiences, and results from the UW ACES interviews are relevant to that discussion. The two capstone workshops identified the goals and values that the 400-level courses under study shared, and those features, along with relevant findings from this interview study, are displayed in the table on the following page.

As the table shows, the learning goals and values of the 400-level courses almost perfectly overlap with the challenges and learning that Geography majors identified in their UW ACES interviews. This close alignment suggests that students are learning what the faculty members engaged in the capstone workshops hope they are learning. In addition, it is important to note that 87% of the Geography interviewees for the UW ACES had two or three quarters to complete before graduating. Furthermore, about half of the courses mentioned as the sites where students did their most challenging work were 300-level courses. With these results in mind, we can draw three conclusions from the close alignment shown in the table that follows. First, the undergraduate courses that lead to the 400-level capstone-like courses share the goals, practices, and values identified by the 400-level faculty members participating in the capstone workshops. Second, students in the major know before they reach the end of the major what those goals, practices, and values are; in other words, they are aware of and learning what the curriculum is teaching. Third, these goals, practices, and values are learned through academic and, often, community experiences that students find challenging.

Finally, we noted many times when the responses of Geography majors indicated that students had “enjoyed” the challenges they described or found them rewarding. These responses underscore research on student learning that shows that when an assignment is challenging for students and when faculty and TAs help students meet those challenges, students become more engaged in the course material than they are when tasks are easy. The responses of the Geography majors in the UW ACES suggest that students not only learn a great deal in the face of challenge, but that they value that learning, as well.

The 400-level courses were:	Results from UW ACES for Geography:
Problem-centered, asking students to identify, analyze, and provide solutions for complex problems that communities are experiencing and to engage community issues through knowledge creation using technology and a diversity of research methodologies as well as service learning.	When asked to identify what was challenging about their most challenging experiences (Q2), “Conducting the literature review and identifying the right sources” and “Identifying the best research methods” were frequently-given responses. When asked what they had learned by meeting the challenges they described (Q4), “How to do research” was the most frequently given response, and “The connection between the academic world and the world of work outside the academy” was mentioned by several students. In addition, students also noted that they learned “How to write” and “How to think critically in the major.”
Collaborative, most often asking students to work with others on projects.	In Q3, students described collaboration and discussion with peers as one of the things that enabled or helped them meet the challenges they described.
Self-directed and reflective, allowing students to take primary responsibility for their own learning within course constraints and often providing them with the experience of critical encounter with ideas of service, the academy, identity, privilege and discourse.	“Creating my own topic or research question/working on my own” was one of the most frequently mentioned challenges students reported when explaining what made the challenging work they had identified challenging (Q2).
Applied and synthetic, asking students to use prior coursework—the language, methods, ideas and themes that students have encountered across their other classes—as they think about and complete work for the 400-level courses; there are taproots back into the curriculum (or a part of the curriculum) that are brought into conversation though these 400-level classes.	Several students spoke of the challenge of “Synthesizing/putting all the pieces together” and “Thinking in a different way” in response to Q2. In addition, when asked what helped or enabled them to meet the challenges they had described (Q3), “Previous courses or course material in the major” was one of the most frequently-given responses.
Complex, allowing students to develop self-confidence in creating change while experiencing moments of vulnerability such as insecurity, making mistakes, and facing dead ends.	Individuals spoke of experiencing vulnerability and developing confidence, but these aspects of their experience were not a prominent theme in students’ responses to UW ACES questions.
Bridging experiences that led students to think about how they might link their interests and knowledge with future work and/or study. For example, in their reflective essays students noted that the course(s) “helps me identify my specific interests,” “helps me make a difference to the client, the environment and the people of Washington” “gets me out into the community to apply and experience theories I’ve been learning about,” and “teaches me how to drive social change.”	In response to what they had learned by meeting the challenges they described (Q4), several students mentioned “the connection between the academic world and the world of work outside the academy/my future direction.”

Two Students' Responses to All Four Questions

Course where greatest challenges occurred: Geography 315.

Q1. What was the most challenging work you did? *The final paper in Geography 315.*

Q2. Why was it challenging? *The theorists I read were really hard to understand and hard to apply to the final paper so it was a hard challenge. (My subject was) an assessment of contemporary supply chain development in China, an assessment. You had to look for specific information but the theoretical stuff was on a whole different level, and the available stats were either out of date or didn't really apply. It was hard to find good sources, and the theoretical arguments seemed far removed, yet we had to use them as context.*

Q3. What helped you meet that challenge? *I had to read a lot more articles and learn where to find the stuff I needed. I really had to drill down through the layers of data and articles to find something I could hang on to. Once I felt like I had some accurate data that made sense to me, I could see more connections to the theoretical material. The class was about so much more than just learning the various steps of the research project, but also about aligning your data with your theory and method. It was really, really hard.*

Q4. What did you learn by meeting that challenge? *How to do academic research—the process, the steps, the format, how to cite materials, how to make an argument, really. Once you understand what a real argument looks like and how many parts there are to it, the other classes get easier, but this class left some scars...*

Course where greatest challenges occurred: Geography 490

Q1. What was the most challenging work you did? *The project in Geography 490.*

Q2. Why was it challenging? *[We had] to do a neighborhood project and look at the nature of public space. What is public? What is private? That stretched my thinking about urban spaces and private property, restricted spaces. It was challenging to think that way, about how the city gets planned out and how power relations affect how space gets allocated.*

Q3. What helped you meet that challenge? *Talked to a lot of classmates. It was a small class and workshopping ideas between other students and the instructor opened things up for me. Everyone was more in tune with homeless help programs around the city, so they taught me a lot about the political structure in Seattle and what was really going on—the nature of exclusion, questions of social control and human rights and so on.*

Q4. What did you learn by meeting that challenge? *I came from engineering and am always amazed about how in Geography there just isn't a right or wrong answer, something neat and clean. A lot of Geography is just trying to explain things better, not "correctly." It has to do with understanding the big picture. The spatial perspective gives you a more complete picture because space really matters. It's not just there—it's a commodity and also politicized.*

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