

Ron and Cassie team teach an Environmental Science Elective with a focus on using Geospatial Technologies at a rural high school, grades 9-12

Ron – we designed this course as an environmental course that used GIS technology. So we have 100% flexibility as long as we adhere to that expectation. The approach that we used on their independent projects requires that they identify the problem that they are interested in investigating and then work backwards to say, what data is going to be required, and then be able to perform the analysis that will come up with a result that addresses their problem. In other words we use a form of backwards design, problem-based approach for each of the student’s independent work as well, it is sort of the way I guide them. Our class periods are 85 minutes long.

Cassie – I think the Backward Design and the problem-based approach we have found to be a really fantastic idea and it has pretty much structured what we’ve done in the course both the last year when we were doing it for POD and this year as the follow-up year.

Ron - Most of the students really were not aware of GIS until they took this course. Many of our students came to us because the kids have had both of us before. And they came specifically because I said it was a good course and they wanted to take another course with Cassie and I. They knew that the courses that we would teach would not be deadbeat courses, they wouldn’t be courses that are just timekeepers. They would be doing something where they would have to you know, use their brain, and they like that. The other thing is that because of my background in geophysics, having worked for industry where I basically did mapping where I collected, mapped and analyzed data, I would always bring in examples or anecdotes of things that I worked on and so they thought that was interesting. I said now, all of the programming I did you don’t have to do it because it is right there in the GIS program, it does it for you. And so that got a couple of them interested as well.

Cassie – yes, and we sold them on the class. The first term is a four-term sequence and the AP class lines up behind it and so half of the class is going to be AP Chem and the other half is AP Physics, or at least part of it.

Ron - The class is a lot bigger this year than it was last year. We started with 54 that requested it. And when they scheduled it they made the arbitrary decision that they only wanted to offer one class. So that immediately cut it down to 35, cut it down because of the timeframe. And so when some had to switch for their Calculus it made it 31.

Cassie – but we only had 16-17 last year so that is almost double which is pretty good. – It was a little bit of a challenge with the larger class because we wanted each kid to have a computer.

Cassie - One student did an independent project on habitat fragmentation. He mapped the open spaces that exist in [the] county, and then he looked for information about the areas which were under the greatest development pressure built over the next 10 years. On the basis of that, he identified regions which should be purchased by the county to try and reduce habitat fragmentation from ongoing development. He presented it in an extremely good manner for all of the teachers, the principal and vice principal. Then he took his background in GIS and he is going to [college]. But with this new skill he now has a broader view of how he can think about things. It isn’t just something, but about something and *where it is*. So adding that spatial context has made him a more thorough thinker and he values that and so I anticipate that he is going to use it someplace in the future.

Ron – One student asked me a couple of times, ‘what are the fields where they use GIS’? We introduce the class with some of the ESRI map books and things like that so they are very aware of the diversity of the application of GIS across the board. If kids can see that this is a skill that can be an attribute to what they want to be doing, then they want to do it.

Cassie- The [Atlas of Science Literacy showing learning progressions of important ideas in science] basically transformed our assistant principal’s thinking about everything. You know, he always credits us for helping him understand better how to challenge kids and take them to another level. But when he saw, [the Atlas] he went crazy with them. I don’t think he gave it back. LAUGHTER – that’s okay, we had two. He could see the connections and that was really very important.

Ron – mostly the administrators are pretty much scared to walk into our classroom...it is true, the first thing they say when they walk into our classroom is ‘I don’t understand what it is you’re doing’. We have more freedom within our school because our school’s agenda is one of innovation, and so they are trying to lead in more of an innovative way, more technologically advanced approaches to teaching. And so from that standpoint we have much more freedom than many might.

Ron – I think that in our context the relevance and the rigor that is immediately added using GIS is an attribute that our whole school is striving to get. So not only are we going to be using it, but this year we are mentoring 13 to 15 teachers right now to try and get them to incorporate lessons using GIS in their classes. And this gamut includes all the way from math classes, to an art teacher, to humanities

and social as well as English teachers, so we’ve got an entire spectrum of people who are interested in pursuing this and bringing this into their classroom. And primarily because of the fact that we’ve demonstrated that it improves both the relevance aspect of what you are doing, so the kids have an understanding of where things are and how they relate, as well as our principal/asst. principal have been sold on the rigorous aspect of it. That it immediately incorporates higher-level thinking skills and they want that.

Cassie – it is amazing. It is an incredible tool.

Ron - In terms of the GIS, (POD) was excellent. In terms of the educational foundation, development, project-based learning, that was all excellent. The thing that teachers need, everything that I saw at POD was excellent, the thing that teachers need is incentive to do it.

Cassie – and even so, it took getting together as a group as a school, and the confidence that we would help them, and even doing it together. It is online and it is entirely on their schedules. We are just meeting at our school for the teachers at our school during certain times so that they know there will be someone there during certain times if they run into trouble and can help them.