

Hi! My name is **Lyzi Diamond** and this talk is called

From **button pushing** to **problem solving**: modern geospatial technology in the classroom

*P.S. Today is **Thursday, October 20th, 2016** and we are at **NACIS** in **Colorado Springs, Colorado**. You know, just FYI.*

**This talk is about what it's like
to teach people how to use
something that's changing
literally five times a day, and
how some of those techniques
can maybe make their way into
the classroom.**

**My name is Lyzi Diamond, and
I'm pretty sure I have no idea
what I'm talking about.**

**This phenomenon is called
impostor syndrome. It's the
feeling that all of a sudden
everyone is going to find out
that you secretly know
nothing and are just faking it.**

This is strangely apropos. This talk is supposed to be about how to teach modern geospatial technology in the classroom, to better prepare students for the world after college.

**Well, the world after college
seems to have a lot of
impostor syndrome... at least
if you want to keep learning
new things and building and
growing.**

There are lots of people who don't. I've met lots of people who want to have the same job and do the same things every day. That's totally legit.

But I've also gotten hundreds of emails from students and folks who recently graduated who want to know how they can get a job not as an entry-level GIS technician, but as a problem solver.

I can speak to my experience here, both as a student and recent graduate wanting to learn more about the world of geospatial technology, but also as an instructor of sorts.

**Oh, me: I work at Mapbox
teaching people how to use
Mapbox and answering their
questions about web mapping
and mobile and analysis and
really anything even tangentially
related to what we do.**

I also taught a community college class about web mapping and have taught many workshops and guided tutorials and other things. Teaching is really fun.

In my time teaching, I have learned some things about the weird and wacky nature of the geospatial technology world. I think some of these things might help when trying to teach new technology in university classrooms.



**Thing #1: it's easiest to get
students to care about
something if they can relate it
to something they already
care about.**

**It's really tempting to send
students to a site like
Codecademy or some other
equivalent to learn how to
code. These tutorials are
accessible, step-by-step
walkthroughs.**

Many people have found success with Codecademy, but the folks I've talked to struggle with its abstract nature. It feels like programming in a vacuum.

It lacks context.

**The best way to learn is to
work on something you care
about. The way to make
something hit home is the way
it relates to your world,
personally.**

**Geospatial analysis and
cartography are literally
present in our everyday lives,
from Google Maps on your
phone to Facebook and Twitter
and Foursquare and and and**

**The way people really learn
new technologies? They
approach them as new tools in
their belt for solving the same
problems they've always been
trying to solve.**

**Traditional GIS technology like
ArcGIS (which many of us
learned in school) is super
useful. It's one amazing tool.
But there are other tools, too.**

So if we break this into two parts for getting students excited about learning new technology:

- 1. Appeal to the idea that a new piece of software or new library is like adding a tool to your toolbox.**
- 2. Make it real by putting it in the context of a problem or situation the student is in every day.**

**Thing #2 (related): people
come to this field because
they like solving problems, so
give them problems to solve.**

**This is not just about framing
GIS projects as problems. This
is about taking problems and
applying them to the
geospatial context.**

If we assume our students like solving problems, we can give them an incredible gift: we can encourage them to approach their problems outside of the context of the technology they know to be possible.

**We are in this cool time where
we are inventing the future of
technology. We are no longer
hamstrung by what the
technology can do.**

This is where the value of teaching open source comes in. When you learn about open source and new technology, you can become part of the communities that build it.

**We can literally set our
students up to shape the
future.**

This is mindblowing.

**Unfortunately this can
sometimes involve some
scary things... like pointing
students in the right direction
to learn git or JavaScript or
whatever else.**

Stay tuned.

**Thing #3: we need to help
students ask better questions.**

This is the best preparation for industry I can think of. I ask Google questions literally every hour when I'm at work. The biggest challenge is learning how to ask the question and how to know you've found the right answer.

Amazing resources beyond Google to look out for for good answers:

- **StackOverflow**
- **Twitter**
- **Product documentation**
- **Product support**
- **Weird blogs and tutorials (hi)**
- **GitHub**
- **Reddit (believe it or not, surprisingly helpful)**

This applies to the problem space described in thing #2 as well — asking critical questions can help identify new problem spaces and/or reframe the problems we assume to exist.

So many of my assignments in college were problems that were given to me. I had to find the solution instead of the part that became much more important in my career: figuring out what the problem even is.

**I see this in support and I see it
when I'm writing code and I see
it when I'm trying to make a
map that isn't going to make
someone laugh. To succeed,
you need to be able to define
the problem space.**

**You also need to be able to
communicate about the
problems you see, even when
someone is disagreeing with
you. This is what I mean about
inventing the future. This is
what we get to do.**

**Thing #4: teaching is hard but
it's also something everyone
should learn to do.**

You never know something as well as when you know you're going to have to teach it or explain it to other people.

Why should we deprive our students of this most basic skill? Maptime found success here in two ways:

(1) comprehensive understanding of a problem area, and (2) giving students the agency to teach something in the way they understand it.

Also, if we can have the humility to ask our students to teach themselves, we are both preparing them for jobs (see thing #3) and making sure that we don't have to learn every new thing that comes along.

The most radical act for an instructor is letting yourself become a student. It's so hard, but it's so rewarding.

Thing #5: embrace complexity.

**The folks I've found to be
most successful are the ones
who run towards hard
problems instead of away
from them.**

**The people who write into
support complaining about
changes in the product who
haven't even tried the newest
versions are the ones who
never publish a map.**

**New things are intimidating.
You have a problem you want
to solve and you want your
tools to work in service of
solving that problem.**

**But we don't know what you
want to do until you tell us.**

**Maybe it's not something
anyone has ever done before.
This is what we want from our
students, right? New ideas and
new approaches.**

Geospatial technology is an interesting juxtaposition of old ideas and new technology being applied. Previously, that technology limited a lot of the possible. Now, with input, it's growing to encompass so many of the things it couldn't do before.

We don't have to compromise.

**We can do anything we want,
and if we can't do it yet, we can
build it. We just have to roll up
our sleeves and get dirty doing
it, which means being able to
say things like:**

**“I’m a beginner and I need
some guidance.”**

**“I have an idea and I’m not
sure if it’s possible, but I
would love to be pointed in the
right direction.”**

“Maybe this is outside of the scope of this project, but I want to do [weird crazy idea] and I’m wondering how I might go about achieving it.”

“I tried [things you tried] and I seem to be getting [errors that you saw]. Am I on the right track?”

**We are in this field because
we like solving problems. It's
what attracts us to mapping.
Old, hard problems with new,
interesting applications.**

Our job is to instill that excitement and curiosity in the folks that we teach and equip them with the tools to keep learning and growing and building in the direction of their interest.

**The more ways they have to
do this, the better.**

**If I were to sum up this talk in
one slide, it would be:**

**Invest in the weird, crazy
complexity of your students' ideas
and juxtapose it on the weird, crazy
complexity of geospatial
technology. Instead of being the
expert at the front of the room,
make everyone a beginner and
everyone a teacher.**

**Focus on critical thinking,
problem solving, and asking
good questions. This is how
you can help your students
succeed.**

Thanks!

- My name is Lyzi Diamond
- You can find me on Twitter at [@lyzidiamond](https://twitter.com/lyzidiamond) or you can email me at lyzi@mapbox.com
- I haven't put these slides online yet, but when I do you will be able to find them at lyzidiamond.com/nacis-2016
- If I have a ton more time now, we can have an extended Q&A about whatever you want but let's be real I probably talked right up to the end of my 20 minutes
- No, that's not a real mustache

