

Surveying and the Great Education Debate

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Perhaps nothing is discussed more frequently—and heatedly—in surveying than educational requirements.

Should formal education be required for surveying? If so, how much?

If required, how standardized should an educational requirement be among states?

And is education *really* necessary, or would an apprenticeship model do the job equally well?

The truth is the question is even more complicated than it sounds. But there are some unique models out there that provide a starting point for the creative educational solutions that have the power to move surveying forward.

We spoke to several surveying professionals who have also been teaching in the classroom for decades to get their firsthand take.

Modern surveyors benefit from education



One thing is becoming increasingly clear: the surveying profession is becoming more complex each year.

Surveying has a rich set of histories and traditions, but that doesn't mean that surveying practices are stuck in the past.

The rise of new technologies means that while senior surveyors could happily complete a career without needing any formal education or technology training, new surveyors may not have that luxury.

Joe Paiva, PLS, is the CEO of GeoLearn, an online continuing education company designed for licensed land surveyors and technician training. He's also an adjunct instructor at the State Technical College of Missouri.

Missouri happens to be a state that has minimal education requirements for land surveyors. No college degree is required, just 12 credit hours of surveying coursework. It's something Joe's been working to change for years.

Joe believes that just because things were done one way in the past doesn't mean that the surveyors of tomorrow should be shortchanged.

"I want my children to be better than me. I want my students to be better than me. And I want their students to be better than them. And if we don't have that way of thinking in the profession, and we don't have enough of us educators and other people with four-year degrees who have a broader view of how that works, how do you pass the baton?" Joe said.

"We sometimes as a profession tend to think of our profession as being static. That there's nothing changing in how we do our work, whether that's the legal aspects or any other thing."

His opinion is that we can't be a profession that is always looking in the rearview mirror. Instead, we need to transition into a profession that is looking forward to the future, and education is a part of that.

Jim Coan is a professional land surveyor in Washington and Oregon and a certified federal surveyor. He worked for 1 Alliance Geomatics in Seattle and taught at Renton Technical College for 23 years.

He agrees that we need to look forward. "I used to tell my students that when I started surveying in 1968, it was closer to the way George Washington surveyed than the way we're surveying today," he said.

"We're not plain surveyors anymore. We're geomatic surveyors, like it or not. And we need to know that stuff, and we need those technicians to know it."

Jim currently teaches a class on random error theory, which he believes is one of the most valuable classes a surveying technician can learn because it teaches important measuring skills.

"I used to be one of those guys: nope. We don't need any education requirements," Jim said. "But my mind has been changed. We need to have the technical expertise. And that comes through a combination of experience and education."

Education differentiates you from the crowd

Even if you live and work in a state with little to no formal education requirements, education is the way to go if you're serious about advancing in the profession and standing out from the crowd.

Education doesn't have to consist of a four-year surveying specific degree.

While a four-year degree in any subject is a valuable asset because of the critical thinking skills it provides, the reality is that most surveyors are non-traditional students by the time they make it into a classroom.

Maybe they discovered surveying late in life and already have a family to feed.

Or maybe they've been happily working as a technician for many years before getting the urge to take the next step in the surveying profession.

Adam McCartney is a survey party chief at the Maricopa County Department of Transportation in Arizona. With 19 years of experience in the field, he enrolled at Great Basin College just three semesters ago.

"I've made a pretty good living being a solid technician and party chief in the field. And there's no reason that I can't continue to do that for another 20 years and sail off into the sunset. But I have a drive inside that's pushing me to go beyond being just a party chief," Adam said.

Adam already has a CST Level 3 and is now on the path to getting licensed. However, he knows that the more serious he gets about becoming a professional, the more opportunities he'll have to advance.

"Arizona has no educational requirement for licensure, so anybody can go get a license in Arizona. And I've seen some surveys that are evidence of that. And so, what I wanted to do was try and do something that in the future is going to separate myself from my peers because it's getting more and more competitive out there," he said.

He hopes that obtaining a Bachelor of Applied Science in land surveying will help give him an edge.

It took him nearly two decades to decide to get a four-year degree, not just because his motivation took a while to kick in, but because it was daunting to wrap up a full day of work as a young surveyor and then go straight to class afterward.

"I reached a point when I discovered Great Basin College. And with the advent of online technology, there were really no more excuses for me not to do this. I can do it right here from my desk at home late into the night, early in the morning," Adam said.



Surveying is a delayed vocation



In his many years as an educator, Joe can attest that many surveyors end up in the classroom later in life.

"A lot of those people [I teach] have never been to college in their life. Some of them are 50 years old," Joe said. "For many people, becoming a licensed professional is a delayed vocation."

The complication arises from the fact that there are few dedicated surveying programs in the country and fewer still options that offer older students the flexibility to thrive.

Todd Horton is an instructor at Parkland College in Illinois, where he created a land surveying program in 2001 and is the director of the construction management program. A teacher for over 23 years, he is also the owner of Meridian Geospatial Consulting.

He recognized that traditional classroom education models weren't meeting the needs of most surveyors.

Instead of sticking with the status quo, Parkland College decided to change things.

"We've evaluated our market and realized the low hanging fruit—the people that want the most to come to get training and get licensed—are the ones who can't because they're already working. So, we have changed our model so that instead of having to come to classes during the week, they come to get our hands-on labs on weekends."

In other words, instead of coming to class once a week for 16 weeks, surveying students can come for three weekends per course.

"Our mantra is come earn 24 credit hours of surveying but coming to Parkland one weekend a month for 24 months," Todd said. "Our students really love it because it fits their life."

This is the crux of the debate about surveying education: we do need education, whether it's a degree or continuing education, or both.

But what we also need are innovative methods for getting that education, such as online programs, boot camps, or weekend labs.

Educational programs for surveyors must be nimble

Saying that we need flexible education opportunities and creating those opportunities are two very different things.

Particularly at four-year institutions, changing things up is a long, drawn-out process fraught with political complications.

It's often much more possible—though still not easy—to make meaningful changes at more agile community colleges.

Joe, Jim, and Todd each have compelling examples to share of ways the institutions they've taught at have implemented changes for the better.

"In Missouri, we've decided to provide as much of the education online as possible so that they can get it no matter where they are in the state, or for that matter in the country," Joe said.

Like the weekend lab option that Todd described at Parkland College, Joe's seen even more flexible options in play.

"When I taught for a year at Texas A&M Corpus Christi, they allowed labs to be done remotely mentored. So, we have lab projects, and we tell the students, if you are too far away from campus, you find the licensed surveyor who will actually sign on the dotted line and provide the equipment," Joe said.

That means students could partner up with a boss, mentor, or another licensed surveyor to complete the lab work using that surveyor's equipment instead of traveling to campus in person to use equipment at the school.

Completed lab work is then sent in to be graded in the normal manner, once signed off on by the local surveyor.

"We're still doing the grading the same way. We still provide the same outline for how the project is done. But different people do it differently. And I think that's a good recipe—not the only recipe—for in the future being more inclusive of the entire population to have access to good surveying education," Joe said.

At Renton Tech, Jim said the two-year surveying program was founded based on a vocal need from the profession.

"The education committee chairman for the LSAW, Land Surveyor Association of Washington, came to the school and said they wanted to put together a two-year program," Jim recalled. "The president of the school said, yeah, we'll look into that. But we have to get a buy-in from the profession first."

Jim presented the case for a two-year program at a Renton Tech board of directors meeting and explained why such a program would be valuable. The board then endorsed the plan, and the surveying program was born.

To further design the program for actual surveyors, Renton invited professional surveyors to campus.

"The Dean said if you could have your surveyors learn anything you want them to learn, what would it be? And they started writing it down, and we refined it from there. And that's how we created it," Jim said.



To say the program was a successful model would be an understatement. According to Jim's tracking, the program has hosted 78 professional land surveyors and over 100 LSITs. To top it off, Jim is currently employed by one of the graduates of that very program.

Todd is also excited about new programs being formed in Illinois.

Through the US Department of Labor, the Illinois Professional Land Surveyor's Association has created a new apprenticeship program.

"We call it a boot camp, basically learning how to set up and operate basic instruments. After that, those apprentices will be starting some formal training. It'll be effectively four college-level courses at Parkland College spread out over the next two years," Todd said.

The belief is simple: if they grow an apprenticeship program, some of those apprentices will eventually self-identify as future land surveying professionals and voluntarily seek out the next step in their career.

Again, this type of program is made possible thanks to an agile and flexible mindset.

"One of the reasons that Parkland is able to keep doing its thing is that we're fairly nimble from a business model standpoint," Todd said. "We have the ability to hire people based on their experience, whereas some of the universities don't. Because of their charter, they have to bring people in with the masters and the Ph.D. level. And there's not very many of those."

The overhead and the infrastructure at the university level can be a blessing, but it can also be a cost that has to be dealt with.

When Todd says Parkland is nimble, he means that they transitioned from a traditional survey program to their new weekend land surveying program format in just six months.

The program was first advertised at the 2017 annual conference of land surveyors. The demand was instantaneous.

"That very day we announced it, I had people coming to our table saying, where do I sign up?" Todd said.

Technicians are undervalued



All this talk about education should not detract from a single important fact: perhaps the greatest asset to the land surveying profession are its technicians.

"We also have to tell our surveyors that if you choose to stay a technician, you can make a very good living. Every person does not have to become a professional technician. As we all know, they're worth their weight in gold," Jim said.

If you're a licensed land surveyor, try to picture your day-to-day workflow without technicians. You probably can't.

Not everybody has the aspiration to become a licensed professional land surveyor, and that's okay.

Surveyors, instrument operators, and party chiefs are all engaged in the work that makes companies money. They are literally invaluable.

Todd agreed that technicians are the foundation of the profession.

"Generally, when I talk to people, they're saying we need three to five technicians for every land surveyor. And I know in my state, there's been such a push over the last two decades to make sure that we're getting professional land surveyors pumped out that we have neglected our technicians. Our technicians are the most underserved and most important people in our profession," said Todd.

The moral duty to mentor others

Many successful surveyors have thrived without education. Typically, that's because they were lucky enough to encounter an incredible mentor who helped shape their future.

While mentorship is still incredibly important, good mentors—like formal surveying educational programs—are becoming fewer and far between.

That's why the surveying profession truly does need a combination of education and experience under mentorship to see the best success.

"The loss of mentoring is a trend that parallels our technology," Todd said.

"We went from taping everything and doing control work with invar tapes and things like that. And we got an EDM. Wow. Crew size started shrinking. And by the time I showed up doing survey in the early nineties, if you had a three-person crew, you're working for the state. And if it was a two-person crew, that was everybody else. And now we're down to one-person crews."

If you're on a one-person crew, that means you're flying solo, with no mentor or coworkers insight.

"I see mentoring as something that we have to replace somehow. And I think the apprenticeship models are a great way to do that," Todd said.

If we can't do mentoring in the same way we did in the past, that means we need to find new ways to impart those same lessons.

Apprenticeships or structured training programs like those that exist in parts of New York and California could be part of the answer. Because the reality is that multiple-man crews will not return anytime soon due to economic factors and a shrinking surveyor workforce overall.

"Maybe state associations are standing up their own training programs. Maybe it's not even a formal apprenticeship, but maybe it's a matter of saying, hey quarterly, we've got this cadre of talented surveyors who are also pretty good at teaching. And we're going to have technician camp once a quarter in different corners of the state," Todd said.

"An adage that I have learned, and it doesn't just apply to surveying, is 'match the tool to the task.' And when it comes to education, sometimes we're going to start with the tools we have. I know that not every state has the ability to stand up an educational program, but they do have talent. Talent within their professional associations. And I believe as a profession; we have a great opportunity ahead of us to cultivate that talent."

As surveyors, we have a moral responsibility to help pass the torch to future generations.

Creating quality learning opportunities, both inside the walls of a classroom and out, will be the collaborative task that faces community colleges and professional organizations in the future.

Editorial notes: Mr. Jim Coan, cited in the article and was part of this podcast, unfortunately, passed away on August 8, 2021. Jim was a gentle giant in the profession and a huge advocate for education and mentorship. Jim will truly be missed!

The was also mention of the lack of land surveying college programs in the United States. There are more than you think available. Check out the list compiled by Heather Keenan for the Nevada Young Surveyors Network and the www.landsurveyingcareer.com

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