**Michael Wangler Interview  
Learn how a college significantly improved equitable outcomes in math.**

**AS** [00:00:00] For today's podcast, I'm so excited to have Michael Wangler. Michael has over 20 years of leadership experience in community colleges, both as a faculty member and academic administrator. Since 2017, he has served as an academic dean at Citrus College, California, where he spearheaded major developmental ed reforms in mathematics that led to significant increases in success and completion rates and transfer level math, while also narrowing equity gaps among first generation and low income students. He also oversaw career education at the college where he developed and integrated pathways model that links adult education, noncredit and credit programs to serve the workforce development needs of the community. Michael began his higher education journey as a student at Grossmont College in San Diego, where he was inspired by the experience to pursue a career as a community college teacher. He earned his B.A. from UCLA and a Masters in Geography and Earth Sciences at UC Riverside, and while at UC Riverside, he began teaching at Mount San Jacinto College and in all three campuses within the Riverside Community College District, ultimately serving as a full time faculty member at Cuyamaca College in San Diego County for over 16 years. Most recently, Michael joined Growing Inland Achievement, a collective impact nonprofit focused on improving higher educational attainment rates in the Inland Empire region of Southern California. He provides institutional support where he works directly with the region's K through 16 partners to help institutions identify and implement promising practices for improving educational outcomes. Welcome to the Students Success podcast Michael!

**Michael Wangler** [00:01:36] Thanks. So it's great to be here.

**AS** [00:01:39] So a little bit of background. We've known each other for about four or five years. You came to Citrus at around, it was 2016 2017.

**Michael Wangler** [00:01:49] August of 2017.

**AS** [00:01:51] And I had been working with the college from around, it was around 2010 2011. I helped to bring in roughly $9 million to the campus, mostly in strengthening institutions grants. And so I had an opportunity to evaluate and provide some implementation guidance at the college. And then when California decided that, the chancellor's office, you know what, we're we're going to invest in guided pathways, that's when they brought me in again to help with that. And that's when we met because I was helping the college create a solid structure for the work. We had solid work groups with a purpose and they knew the outcomes that they needed to achieve and you were part of that process. It's also worth noting that because Citrus had invested time and energy in securing strengthening institution grants, one of them was in English. The work that they were doing and English was already ahead of what was going to happen years later in California with Assembly Bill 705, developmental ed reform. So it was nice to witness that to see that unfold. And so when the guided pathways, work began, then also, the math work began. The developmental ed reform in math at Citrus College. And that's what we're going to spend the majority of the time on this podcast episode is unpacking that journey, the trials and tribulations, but the beautiful outcome of improved student outcomes and closing equity gaps. But before we get to that journey, michael, if you don't mind, I ask all guests if you wouldn't mind sharing a hobby, a special talent or something that that you would mind sharing?

**Michael Wangler** [00:03:37] Yeah, sure thing. So something that I have always been passionate about is spending time outdoors, running and long distance hiking. I've hiked the John Muir trail two times. I've done most of the Pacific Crest Trail in California and I continue to hike to this day. For my running, I love running as well, and I started running when I was in high school and ultimately ran at Grossmont College. We were state champions, got to run at UCLA, run at a Division One, which was really exciting. I was part of a track team at UCLA and in 1988 that won the National Championship and had something like 12 gold medalists in the 88 Olympics or something. I was not one of those. And they were all sprinters and throwers, but it was really cool to be a part of that actually to this day, you can walk to the top of Drake's stadium at UCLA and see an old, faded photograph of our 1988 team. Go there and try to pick me out. After that, I started running, you know, semi professionally, mostly for fun. But one thing that I'm really proud of and is kind of just a unique, unique experience is I actually ran for a running club called the Himultoads, and Himultoads actually became pretty famous in the 1970s and 80s for, they had a bunch of elite runners. It's was started by the track and cross-country coach at UCLA, Bob Larson, when he was still in San Diego. He wanted a club where his high school and college students could run off season. So he named it after the small little rural town in eastern San Diego County called Himul. I got to be a part of that team after I left UCLA, and it was really kind of, you know, a social running club as much as anything. But we were really good. Got to run in many elite events. The Nationals up in San Francisco with that club got to run alongside Zola Budd. If you remember Zola Budd from back in the South African elite athlete back in the 1980s and early 90s. But I think the most interesting experience was when we set the world record in the 10K Centipede. A centipede is, I don't know if it's still a thing, but back in the the 1990s, at late 80s and 90s, you would see these at major races. You would even see them in half marathons and marathons where there would be basically 13 people. Sometimes all women, sometimes all men, sometimes a mix, all tied together with a piece of fabric. And you would run the race together, and you really were no faster than your weakest link. And so you are always trying to motivate other team members who may not be having as good of a day. And we actually, I got a call about two days before this race down in Palm Springs, a 10k hadn't run with this team and maybe a year. And I got a call said, Hey, do you want to? Do you want to go set the world record for the 10K in the centipede? I'm calling up all of, you know, all of our former toads. We're going to go set the world record. Like, why not? It sounds fun. I was living at Riverside at the time I drove down to Palm Springs. We all, you know, put the, you know, it was kind of tied ourselves together with this fabric and the race was off and we had a great run. I don't remember exact time, but it was around thirty one minutes for a 10k. Thirteen guys all crossing the finish line in 30 minutes, which is about a five minute pace per mile, and we beat the record by like 20 seconds or something. It was short lived, though, because Team Nike, which are the really good runners who got paid to run, they found out about it and a few months later, they put out their elite team in a centipede and just destroyed our world record. But it was it was fun while it lasted. And, you know, one of the great, great running stories I remember very fondly.

**AS** [00:07:49] Well, two things, as you know, I did my graduate work at UCLA. So now when I go back, I got to find that picture of you. I'll go ahead and take a picture of your picture. And then the second thing, Oh my gosh, the centipede 13 runners connected by fabric. So rich in metaphors. It's blowing my mind. So we're actually, we're going to unpack that a little bit because I can't imagine with the fabric and ensuring that you don't trip over each other that someone who might be a little bit more tired. How do you support that person? How do you handle the different, although they might be subtle speed. That's just fascinating. There are exercises like that I remember way way back in the day in the military. When we do exercises in groups who have like a log and we'll do a sit up, and while we put it over our shoulders and you really get to see the weakest link is when you're hauling a big log over your shoulders with about four or five other people. But thank you for sharing that, Michael. And so you have the world record for a little bit. And then they brought in the big guns, the paid guns. That's fabulous. So let's get started with this journey at Citrus College, where the faculty have just been fabulous. They they've been the ones who really made the change and you were there to help shepherd it. I always encourage teams, as you know, when I do a lot of my work, what is your why? Why, why? Why are we doing this? Exactly. So can you take us through that part of the journey? What was the why and what led faculty to go, uou know what, we need to change. We need to do something.

**Michael Wangler** [00:09:38] When I arrived at Citrus, there had already been some, some work done, as you had mentioned, and there were some workshops on using multiple measures for placing students into math. And, you know, really looking at looking at data, looking at high school GPAs self-reported, you know, on transcripts and how well they relate to see how successful students are in math. A lot of that research and conversation had already started when I got there, so I picked up on it right away. There were really, I'd say, two or three key moments that made the difference. One was, well, first of all, I was new. You know, when you come into a new situation, especially at a college and as an administrator, the faculty cut you a little bit of slack to begin with, say, you know, they're not going to give you a hard time right away. They want to find out what you're about. I started talking data with them and I started, I also supported early on some of the curriculum changes that they were looking to make, even before AB705 came about help to build some trust there. I think that's really important to when you're working in a new environment working with faculty, you got to build their trust and you got to, especially with math faculty, you've got to make sure they know what you're talking about. Is this legit? That was an important component was to go in armed with data, have honest conversations, support the things that they wanted to do that made sense and that the data support it and kind of build on that from there. So some of the key studies that we looked at. One was a self-reported high school study where we had a cohort of students that we actually had there, we have their actual transcripts and then we also took their self-reported data from CCC Apply when they applied to the college and did a comparison and basically found that the self-reported high school GPA was pretty darn close to what was on the transcript. And then we placed students into math classes based on their GPA and their highest math class completed in college, rather than using the test at the time which was accuplacer. The students, they took the accuplacer test, though, because we wanted to be able to do a comparison. So we, you know, we gave them the exam and looked at that compared to where they placed into the math classes just based on their high school record. And it was really quite quite remarkable to see that the difference for, you know, for example, in in calculus one. Just looking at the exam alone, this cohort of I think it was about twelve hundred, actually, it's yeah, 1280 students, just three of them placed in the calculus one based on the exam, based on the accuplacer or the old placement tool that most colleges adopted and hundreds of students placed below transfer level on that exam. Self-reported high school GPA, which we had already validated to be legitimate because we were compared it with their actual transcripts, we placed them into math based on those, you know, those records, and we ended up with one hundred and forty nine students placing into Calculus one based on their high school record. And this wasn't just because they had completed algebra two or something in high school. These are students who had taken calculus in high school. They would take the exam and not do very well and end up placing one or two or three levels a transfer in college. And a lot of them just gave up or they didn't want to be STEM majors anymore. They didn't see the point. So when we were able to put them into calculus, when they were already prepared for it in high school, put them in a caculus based on their high school record, they did very well. So those hundred and forty nine students, many of them ended up taking the calculus and passing it and then going on and being successful in Calculus two as well. Whereas if we were only relying on the exam, only three of them were able to take calculus once that was really an aha moment for the faculty. This was just a pilot. This was not the way things were for most of the math classes. Most students were still being placed using the the old accuplacer exam. And, you know, and at this time, we still had multiple levels below transfer. But this really showed the faculty what was possible. If you use the high school record to play students and you place them at the appropriate level, which is transfer level and to see the success that they had. And that just kind of it started snowballing from there. And at that point, that was about when AB705 hit the scene. So it was just a few months after I had arrived. We were already doing this work. AB705 came on the scene, which basically, you know, really pushed this idea forward to use the high school record to use multiple measures, in particular the high school overall high school GPA, combined with the highest class completed in high school to create placement criteria for placing students at the transfer level, while at the same time eliminating the basic skill sequence or at least reducing it and ultimately eliminating it so that all students have access to the transfer level. That's where it all started. Was looking at the data. Building the trust among the faculty and I have to share one more thing, which is I I call her my secret weapon, a math professor from Cuyamaca College, Terry Nichols. She is just an incredibly passionate math professor, really strong advocate for this type of work. Cuyamaca Is one of the first colleges to implement a lot of these, AB705 reforms before it was even a thing. She continues to this day, excellent teacher and I actually showed our math faculty at Citrus College a video of her classroom and then had her come up and talk to the faculty directly. And we took the faculty at Citrus down to Cuyamaca to visit her classroom and others to actually interact with the faculty. See how they're they're doing ,this very student centered, equity minded type of teaching in the classroom. Because it's not just about placement students. The transfer level tells about supporting them appropriately and teaching with an equity minded focus in the classroom at the transfer level so students have the support they need and build a confidence they need to be successful in the transfer level. And so all of that combined really is what launched us on our journey, because once the faculty at Citrus, we're able to visit the Cuyamaca classrooms, see Terry's class in action, there was no going back there. They came out of there and said, We absolutely want to do this.

**AS** [00:16:33] Could you also, explain the different levels. There was another why that was very interesting about Citrus College is that it did its own research. It really looked at what's happening here, what's happening locally. And then you have some data where when we had X amount of students, four or five levels below the throughput, what what is that? Even if we have 60 or 70 percent success rates for each as they go through the sequence? What does that actually equal in raw numbers? So can you give us some of those figures?

**Michael Wangler** [00:17:13] Yes, thank you for bringing that up. I was actually going to go there next, but I felt like I was. I was talking a little bit too long, so I wanted to make sure that we could have a little break and continue with the conversation with this very important part of the data that that helped, you know, with with this whole process. Because really, this is kind of the second part of the why, in a sense, where, you know, the initial data showed us we had a problem and this was part of the initial data. But really, this showed us that we had a problem with the basic skill sequence. And that was the key. That was the link to AB 705 where we we did what are called progression studies, where we would look at a cohort of students that say started two or three levels below transfer. And what happened to those students through their journey? And so, you know, say if you start with a cohort of roughly 200 students, three levels below. And you have a fairly good success rate in that class, maybe 70 percent of the students pass that class. Well, then they got to move on to, you know, so that was three levels below. Now they've got to move on to two levels below. Not everybody moves on. Right. There's certain attrition along the way. So 70 percent pass the class. Maybe 70 percent go on. So you're losing 30 percent of those who had passed. You get another, you know, so now we're two levels below another 70 percent pass. And I'm just kind of simplifying it. And these numbers are pretty close to the reality. And so 70 percent more go on to one level below. But in that transition, another 30 percent disappear, life happens, there's things that come up that you get tired of taking math classes, they feel like they're trapped in this endless cycle or they're still stuck in in the special skill sequence. Then you get to one one level below and you can see by the time you get to actual transfer level, if you're at 70 percent success and 70 percent of those go on to the next level, it's actually pretty simple math. When you think about it, quite seven tenths point seven times point seven times point seven all the way through the sequence, and suddenly you're at like four percent of that original cohort that actually gets to transfer level. And if they're a STEM major, then they still got to go through pre-calculus calculus and you basically don't have any of them make it through to through the entire sequence. You're down to like one. Maybe one student of that original 200 will get through Calculus two, which is really the kind of the critical class critical and important for most STEM majors is calc two one in 200, if you're lucky. That was really eye-opening for the faculty as well. To look at this progression states, we looked at three levels below two levels below one level below and even one level below. You're still only getting maybe 20 percent of the students through to transfer level. Where when you put the students at transfer level directly, the success rate might not be quite as good. Yeah, the 70 percent success rate at three levels below put them in a transfer level at a support class to it. Maybe the success rate is only 60 or 65 percent, but. They're actually in a transfer of a class to start with, so now you're getting 65 percent of the students through in the first try. We're below because of the attrition that would happen. You would only get, you know, single digits through at that same level. So that was really, really important for the faculty to see that as we were starting the reforms for AB705 and realizing we can't be placing students below transfer anymore, we need to put them at the transfer level and provide the support necessary for the students who may not be as well prepared in high school.

**AS** [00:21:17] So thank you for sharing, Michael, because that's powerful. Going back to the centipede run because you mentioned something very interesting. You had a would you call it a secret?

**Michael Wangler** [00:21:29] Secret weapon.

**AS** [00:21:30] A secret weapon, right. Yes. And you had the ability to have faculty go visit another campus so I can hear this podcast, people listen to it from all over the country, well, that's nice. Well, I don't have the luxury to go, we don't have any local examples, I don't have a secret weapon. And I think we've reached the point, Michael, where all this is available now, the research is just it seems to be coming out like every other week I see all over the country research what Citrus did locally. We have colleges that are doing it and then they're publishing it. And so you have that. And then just the the other week I saw one of the just wonderful math faculty at Citrus, Sophia Lee, did a webinar that. I suppose it can't 100 percent replicate going down to a campus and watching someone teach, but boy, it was darn close. And so the secret weapon and the research is out there. So, as campuses that are not there yet, Michael, you're trying to put a team together and you have that fabric and in some of them don't even want to run. That happened because you initially started really with the coalition of the willing. I think there are about five faculty you started with, right? So can you unpack that a little bit? Yeah, you have your why, but it doesn't mean you convince 100 percent of everyone. And so how do you start this and grow?

**Michael Wangler** [00:23:04] I'll return to the centipede analogy as well, where you know that team that we put together 13 people, I think the guy who organized it had to call like 35 or 40 people to get the 13. You got to find that subset that's willing to try something to begin with and then ultimately have, you know, the 13 of us that were willing. It's kind of like the coalition willing you're talking about we Citrus. We had 20 full time faculty, 30 part time faculty, and I was able to start with just four or five. That coalition of only wanted to try something there were four or five full time and a few part time too. So we had a team about seven or eight to start even within that, that team of the coalition of the willing, some people are not, you know, completely bought into it. You have to kind of bring them along if to help them along and back to the centipede example. So the 13 of us agreed to do this, but not everybody was quite up for it. So we had to literally carry two guys across the finish line. I had one right in front of me the way the fabric was attached. They had this long piece of fabric with holes to put your head through. And we were spread out about 10 feet apart. And as we were getting close to the finish because we could see it, we could we could taste the victory. There are a couple of guys who just that they were done there. They had lost it. And I mean, literally with like a hundred yards to go. I was carrying the guy in front of me and someone else was carrying someone else behind us. And we had to do it as a team to get across the finish line carrying people as needed. And that certainly happened with the experience at Citrus, where that initial coalition of the willing seven or eight there were there were a couple of people in there that even after they they visited Cuyamaca saw what was going on went through these workshops just like, no, I I'm not sure that this is this is going to work. And interestingly enough, Sophia Lee, who is now one of the champions of all of these reforms and has implemented a 360 view classroom, incredibly equity minded teaching and learning. I mean, she's just a superstar. She was one of the skeptics in the beginning. She was one of those people that we we didn't quite up to carry her across the line, but we had to provide some extra support because she was teaching very traditionally in the beginning. But once she was in the classroom in this new format where the student's spark was lit and she took it to a whole new level and now she's out training other people, and she's actually proven that you can do it not just face to face, but you can do it online as well. Her 360 classroom is an amazing thing to see and to witness in person. But she's also managed to convert that to an online environment, and the outcomes are they haven't gone down. And if anything, they've, you know, they improved it that between fall of 20 and fall of 21. Her pre-calculus with the two unit support class is doing very well in an online environment and actually at Citrus as a whole. They used to offer several sections of just straight pre-calculus for that support. And a few of the classes with the support, and that has shifted almost entirely to just pre-calculus for support because the students, the students who were taking regular pre-calculus, they saw what was happening in support classes and they wanted that extra support as well. So not everybody flocks to the pre-calculus support. And it's a great team and it's a wonderful, wonderful experience for everybody. And the students get to have that one and done experience and then go on to calculus.

**AS** [00:27:12] You went through the Why, and even with the Why, you can't get all 20 full time in the 30 part time. So you got the coalition. And even when you have that team, there's still going to be some challenges. And it's, you know, it's not an evaluation of pointing fingers, it's just it's a culture change. Culture change, it's just stubborn. Can you then, the next part of the journey was how the college just changed the pathways altogether. Can you explain those pathways? And then you're already explaining a little bit about the pre-cal, can you also explain from the student perspective, they don't see that as a separate co-req, they see that as one class. Let's just take us through the pathways that were created A, and B, how then they look like what's happening in the classroom? What were the pedagogical changes that allowed everyone to see all, my gosh, all these years we were testing students and putting them in these classes, they were, vast majority were never going to make it through. But if we just let them self place and if we just up our game pedagogically, our success rates are going to be almost the same as they were pre AB705. But we have more students than ever before. So can you take us through that part of the journey?

**Michael Wangler** [00:28:33] Just like we only we had the coalition of the willing. We only had, you know, maybe 20 percent of the faculty who were interested in this in the beginning. We also only started small with the courses. We were going to try this new methodology with start with the faculty who willing and open to try something new. But then we also we didn't want to take it all on at once. You have to go incrementally and learn along the way. So we started with statistics, which has made sense. It's a class for liberal arts majors and business majors, and it's pretty it's a class that a lot of students take. We felt that we could, in a sense, want a pilot on that and see how it goes and learn from it and then maybe build from there. So we did that the first year was all about statistics and actually intermediate algebra, which is one level below transfer. So in the early days, we were kind of thinking, well, maybe we just take our one level below and add some extra support to that, and that will be enough to help the students get through. The faculty were not quite ready to get rid of that one level below at that point. We did that and it was a great first year of experimenting, but we quickly realized that even one level below with support wasn't going to help the students. Ultimately, we needed to get them at the transfer level. And when I say support, I'm talking about a very intentional two unit requisite that is developed alongside the main course. So statistics with support at Citrus College, it's a four unit main course at the transfer level. And then there's a two unit co-req, which is actually coded at the basic skills level, but it really doesn't matter how you know there's there's different models for how to do that. Some do it with noncredit, some do it as a lab. The key is that you have this extra time to work on the things that the students may be a little bit weak on or maybe forgotten in high school, things like that. So a lot of it is focused on the things that they might be missing in algebra because there are important algebra concepts to be successful in statistics. So the key, though, with that two unit requisite is that it's not just another class that students take separately with a different instructor. It is linked directly with the main course as scheduled, back to back with the main course. Same instructor. So the students are basically getting a four plus two class that's tied together as a block. And after the first class meeting, they don't even know that they're in two separate classes is treated as one class. They don't know that there's this cor-req that's where they're going to work on an algebra skills, it's all one class and the faculty, through a lot of professional development, a lot of a lot of training they've gone through, they learned how to teach the main course and we then the algebra concepts of the other areas that the students need to work on, weave it into the main material. The students are doing transfer level work the whole time, and they're just incorporating those skills that they might be a little bit weak on or forgotten or whatever, need a refresher on incorporate right into that transfer of a class really helps to build the confidence in the students because they're taking a transfer level class. A lot of these students didn't feel like they were good at math until they got into this class. And there's a lot of team building exercises, a lot of growth mindset that's built into this, and that is all part of the magic that happens in the classroom. So anyway, that's kind of the setup with the two unit co-req. Back to the pathways, we quickly realized after that first year with the statistics and the intermediate algebra that we were experimenting with the support class. Once we got through that and realized we need to go to the transfer level and provide the support needed, we need to align these courses with student majors. Which is really the pathways model, right, we're aligning it with the idea, at least the area of interest or the major the student's going to have. And so ultimately in that next year, not only did Citrus work on developing additional co- requisites at the transfer level, but created six pathways based on a student's major or area of interest. And we have, you know, the STEM pathway with the pre-calculus with support class that I mentioned earlier, the one and done the kitchen. The pre-calculus, which, by the way, eliminated five prerequisites the students used to have to go through before if they were starting at the lowest level. We have a pathway for business and social science majors who need the business calculus class. There was a pathway for statistics, there was a pathway for teachers and early, you know, early childhood education. There is a pathway liberal arts, general, liberal arts pathway. It's a class that the faculty developed called math for everyday living. You know, this kind of teaches you your basic skills for that you need in life, in math, a little bit statistics and a little bit of algebra where it's relevant. But things that you actually do in your real life, where you're going to need math to understand them. We also developed a pathway for career education, which was very unique at the time. I think many more colleges have done this now, but it was, it's a transfer level class specific for career technical education, and the one that was developed in Citrus was linked to the automotive and diesel technology programs. And it's still taught to this day. It's very popular, very successful. I know that the college is working on developing other versions of that same class course to support other career technical education programs at the college. So six pathways, every student has a place to go. It's all at the transfer level. And other than the STEM pathway, it's all a one and done and you are done with your math and you're ready to transfer to CSU or UC or most privates as well. And it's only the STEM majors where you're going to have to take a calculus in addition to that initial class.

**AS** [00:34:46] Thank you for unpacking that, Michael, and in the show notes I'm going to have pictures of what was transpiring in the classroom. I'm also going to link Sophia's webinar because with the pandemic, how do you replicate all that wonderful collaboration that was happening in the classroom? And she explains that so we don't need to unpack all that. I'll have that there as a resource. What I like to get to next is, well, what's the result of this? What are the outcomes as a result of all these pedagogical changes helping ensure that students this is, as you know, some colleges, they are shocked to hear this, that you're allowing students to self place. What but what if they lie? Well. Most don't. And so what? If somehow there is a mistake or something they land in that class, we're going to do everything possible to help them succeed. So what are the outcomes? Can you unpack that a little bit?

**Michael Wangler** [00:35:45] We can focus on the three courses that are the bulk of what students take at Citrus, which are statistics, business, calculus or business for business and social sciences and pre-calculus, which is on the STEM pathway. And those are the three courses that have the two unit corequisite linked to them. The other three courses in the Pathways model also have support built into them, but not with the requisite. So, for example, the liberal arts pathway, it's the five unit math for everyday living. The supports built into that class. So that's, you know, it's another another way to do it, to build the support right into the class that the data is showing that that's just as successful as a core requisite model, which for liberal arts math, that does work. But for these other classes, statistics, calculus that business and social sciences and pre-calculus the co requisite model, that's the sweet spot. Having that extra two units or a lab of some kind that is hard linked to the main course where you can spend that extra time with the students in the class and really dove into a lot of the affective domain types of activities, the growth mindset and the equity amount of teaching and learning. That is what has made all the difference in the world. Right. So there are the structural changes that colleges make, and most of the colleges in California have made these structural changes. They are now because of AB705 allowing students to place at the transfer level, often through some kind of self placement tool that's on the college's website. So students have the right to access transfer level, but the outcomes are really mixed. And in math, a lot of colleges are still struggling because they haven't. Well, there's a couple of things going on. Not all the colleges have adopted this corequisite model. So a lot of students are just going straight into transfer without the extra support. And then there's the piece that magic that happens in the classroom that is alive and well at Citrus and Cyamaca, at Porterville. There's a few colleges around the state that are really doing this well, and that is really the effective domain and the equity minded teaching, the learning that happens in the classroom and that that's the magic that happens, especially in Sophia Lee's class with 360 degree classroom. So the result of that is that, you know, if you look at the data from Citrus, where prior to these changes, just for statistics, say. And just to let you know, Citrus College is a Hispanic serving institution, an HSI. I actually it's predominantly Hispanic, 65 70 percent somewhere in that neighborhood, right next to Hispanic students. And so that was really the population that we were honed in on to really focus because the outcomes for that population had not been good before. So prior to the changes that took place in statistics, we would average about two hundred and fifty completers in the fall semester after the changes took place is now over 650 completers. So more than doubling the amount of students get in through statistics at the transfer level. Another example this year the same thing with the business calculus class. Not as many students take that. Do you see that same dramatic change? In this case, four times as many Hispanic students are succeeding one and done with transfer level calculus for business and social science majors and then pre-calculus with support. That's a big class, right. Basically, the faculty, in order to eliminate those five levels of prerequisites below pre-calculus, they had to combine trigonometry into the pre calculus class, which added an extra unit. So it's a big class six units. And then they had to develop this two unit requisite class as well for the extra support. So it's an eight unit class. But as I said before, I'll probably say it again. It eliminated five prerequisites. So even if all at once or a multi-year pathway where our students were accumulating over 20 units of basic skills classes and many of them weren't even getting through this much better deal. Yeah, it's a big class eight units. But students love it. They flock to it. And this success has been phenomenal. So looking at that, that Latin X or Hispanic population, they have again more than doubled the number of completers in pre-calculus for support. And those students who finish go on to Calculus one and Calculus two and succeed at the same rate as students who are already well prepared coming into pre-calculus. You know, that extra support class makes all the difference, basically catches them back up to speed, and then they keep pace with their peers who are better prepared in high school and have basically the same outcomes all the way through calculus two.

**AS** [00:40:56] Beautiful, just just beautiful and a positive side effect of this is that because students are getting through to pre cal and calculus, you have more students declaring STEM than ever before.

**Michael Wangler** [00:41:10] So that that was that was actually an interesting outcome when I was the dean over mathematics at Citrus. I wasn't prepared for that in the schedule because like all of a sudden, we had all of these students who were either placed into calc one because of the change in the multiple measures placement or got there in one semester because they got to pre-calculus and we doubled the number of sections of calculus one and effectively doubled the number of STEM majors because of these reforms.

**AS** [00:41:39] I like to tell the story of, Michael, that there's a multigenerational family gathering and there's this huge pot of food, one from the oven to the table, and it's just a huge pot. And then there's a newspaper over it. The youngest one in the family. Little girl, she's really smart. She asked her mom, Why is there a newspaper over this large pot and saying, like, Oh, because you know that that helps to keep it at a certain temperature has something to do with the taste. And she's smart. She's not really buying it. Let me let me ask grandma. She goes to grandma. Grandma, What's up with that newspaper? Oh yeah, it's it's to, you know, make sure that it stays at a particular temperature. I think it has to do something with the taste, and they're very fortunate. Great grandma is there. And she's sitting down, a little girl goes up to her and says, Hey, great grandma, what? Why is that newspaper over that large pot? She says, Oh, well, that large lid that we had, it broke. So we had to use the newspaper? I tell this story because we have practices in education. We inherit them and they're antiquated. We can't always explain them. And what makes culture change so difficult is it's hard to go back as to why we decided to do something. But it doesn't even matter anymore. The point is, you went through a process at Citrus of inquiry and action, where you said, Look, this is our why and you took action and you started small and you grew from there. And now they understand that those practices that we've been doing for years, for decades were harming students. It's a sad and happy story, right? Because it's sad we have all those students that who knows what they're doing now. They could have completed college education and they didn't. But now we have a new generation of students who will benefit immensely from these changes. So, Michael, as we begin to wrap up someone listening to this, let's say they're fired up, they want to do this at their campus. They kind of get the Why and start and move with action. They can view the resources that are in the show notes. Nonetheless, there are obstacles, minefields along the way. Could you provide examples of I don't know what it is, Michael, maybe the top three obstacles, the top three or the top five, whatever. It's up to you. What else should they be mindful of as they begin this work, this culture changing work?

**Michael Wangler** [00:44:25] This is hard work. Start with that statement. Because even for a college like Citrus that has been now doing this for a few years, they sometimes get tired. And think, oh, would be so much easier if we just did, you know what back to the old ways. They quickly, you know, wake up from that and realize, no, no, we we are doing good work and we need to keep it up and we need to find a way to sustain and support each other. So that we don't get tired, we don't get burned out and we don't want to go backward. You know, that's really important because it's very easy to fall off this wagon because it is such hard work, you have to really stay with it and celebrate the victories along the way. That's one thing that we always did when when I was in Citrus and use data kind of keep yourself going. Knowing that you're doing good work and that there's more good work to do. So that's certainly one of the, you know, one of the greatest obstacles is just kind of, I don't know the inertia of the whole thing. It's hard to keep it, keep it going. I would frequently walk into these communities of practice that Citrus had established. That's a really good practice for helping to keep it. Keep the momentum going is to be working with. You know, your colleagues working with other people, teaching the same class where you can share. It's a really safe environment. You can share the things that are going well, the things that are not going well. If you had a terrible day and just want to vent for a while, people are there to listen and to help support you. And I would attend these meetings on occasion, usually when I had data to share. And often it was a mix where we would have I would share the good news. Hey, we got 65 percent of the students completed statistics in their first try and we would celebrate. But then quickly, everybody wanted to know, well, well, we want to dig deeper. We want to know like, can we disaggregate the data? Can we can we look like what was the range of success rates? Sixty five was where we were at. OK, well, the range was between, the high was 80 and the lowest 20, and the faculty would immediately start talking about this like, OK, this, we can't have that much of a spread. We need to tighten that up. That is our next task. We're going to we're going to work on, you know, closing that gap. What can we what can we do? And they just start brainstorming and they kind of feed off of each other's energy and they find ways to make improvements. And out of that particular conversation that I give an example of, they actually built. They put together a workbook. They all got together in statistics and built a workbook for the students that that every student who takes statistics at Citrus uses it. So it aligns all of the activities, exercise the outcomes, et cetera. And they were able to close that, that gap also still maintaining very high success rates. So, you know, the challenges are many, but I think that the biggest challenge is the momentum for I guess the first challenges is just getting started right? Getting started what you know, how do how do you change a system that you've been in for years and you're comfortable in it, getting started and then keeping that momentum going? Because there will always be people that will be tired and want to, you know, want to go. Go back to the way things were or just kind of get skeptical over time or this is not something a lot of people look at AB 705 it is already done right. The law happened. It's been implemented. Students are being placed at the transfer level. We're done. Move on to something else. That's just, that can't be the way it is. It is an ongoing process. Got it. You know, keep working at it every single semester, every single year, getting better at it. And that's what helps to drive innovation and keep the faculty really engaged is to keep working. It's like, OK, what? We had a great success. But what's next? What do we do now? Equity gaps. Let's work on equity gaps with work on, you know, becoming more mindful in the classroom. I mean, there are so many things to work on that are going to help our students to be successful in all classes. And, you know, we just happened to have a lot of really good data in in math because we've been really focused on it. But a lot of these techniques that have been developed in math and English courses are applicable to all college level courses and can help support all of our students. You know, that's kind of the next frontier is the math faculty, et cetera they're talking about is like, how can we get our colleagues to do this? How can how can we move this to the chemistry and the physics start with our STEM majors? Then how can we get our history faculty in our psychology faculty to do this kind of work in their classroom as well? And collectively, kind of, you know, raise the institution as a whole to become more student centered and more equity minded. I think structurally there aren't a lot of challenges. It's mostly been taken care of. It's the hard work in the classroom and keeping that going, and that's never going to end in aligning it with guided pathways. That's another key thing is if if you're doing these reforms, but they're disconnected from the work that the college is doing, for guided pathways, you're not going to have the same successes. And this is actually kind of something I'm working on in my new position is trying to, you know, not only help the colleges in the Inland Empire to, you know, make improvements in math and and have better outcomes and support their students, et cetera, but also to align it with guided pathways and to make sure that students are taking the right math class for their major and taking it in their first year. That is so critical. That is, some of the new research that is coming out is showing that when students do not, and it's just about enrolling, not even necessarily finishing students who do not enroll in math and English in their first year, do not continue on. The numbers are just striking that there's a very high percentage like over 70 percent of the students who do not enroll in math and English in their first year do not persist in the next year, where students who enroll in math and English, even if they do not succeed their first try, they are much more likely. It's almost the numbers flipped where you got 70 percent of those who do enroll in math and English in their first year. Even if they're not successful, they persist and continue on. So it's so critical that we align what we're doing with AB705, you know, with guided pathways and very intentionally make sure that math and English are the first classes, you know, the highest priority. I mean, obviously, they're going to take in some other classes as well in their first year, but those two in particular are linked directly with persistence and ultimately degree completion. So we really need to to do some work in that arena as well. It's a it's a huge equity issue. It is. I will actually I will quote our vice chancellor, Dr. Aisha Lowe who told me just last week AB 705 and in particular the math pathways and aligning those with guided to pathways. It is the equity issue of our time. And we need to keep that in mind as well. Colleges are working on their equity plans. Colleges are really taking a deep dive into equity, getting a lot of professional development. This needs to be part of that conversation. This is so important for closing equity gaps and truly kind of walking the walk for equity of actually providing that access, providing the support and getting students to complete their degrees.

**AS** [00:52:47] So the same supports that we provide for students. Now, the way we change things and allow them to succeed, faculty are going through their own journey, too. So it's critical that someone who's fired up wants, to listen to this and go make change is really important to support faculty through training, PD. And I think you've heard me say this a lot of times about the importance of a setting. A setting is nothing more than a time and a place for educators to get important work done. And the setting of a community of practice is key. That is almost like their co-req, if you will, for faculty where they need that setting to stick with it. It's the glue like the same we need that glue so that students stick with their education. Well, faculty need a glue and that community of practice is key. Michael, how often does that community a practice meet, you know?

**Michael Wangler** [00:53:44] Yeah, so when we started with the the reforms, the community practice was meeting once a week every Friday afternoon. Scheduled for an hour, but often would go for two hours. The conversations were so rich at Citrus. Those meetings are probably happening about once every other week now. So they've cut back a little bit. Yes, but they're still incredibly important. And the faculty will, you know who are doing this will tell you that is the number one change that they made that's been so successful. I mean, they would they would give up other things before they get up to community practice. For them, that is key.

**AS** [00:54:28] Right. Because I can hear all Oh no, we already meet too much. We have too many meetings. Well, remember well, the settings that you choose to be in if it's one more. But it allows you to continually improve your craft to truly collaborate with your colleagues to be that we got our back, we got each other's back team and to produce things that support one another that helps students. That's really critical to this. And what we really don't hear too much in the literature that you all going to do co-req and make sure it's not two separate instructors. It's the same one. But the devil's in the details and things are going to look a little bit differently, depending on the campus. But this getting the Why, getting to the coalition of the willing, getting to training and the community of practice that is ongoing is going to be critical. So I want to thank you so much, Michael, for being a part of the Student Success podcast to take us through Citrus College's journey. And I forever now will have this image of you with 12 other people running with fabric. And I'm going to be thinking about that in terms of change, in terms of when, but like math teams come together and the tug in the pull and how we're going to have to carry some of them. And that's OK. And that we're going to fall once in a while and that's OK. But the key is keep going. Don't stop. Thank you so much for participating in the Student Success podcast, Michael.

**Michael Wangler** [00:56:08] Yeah, thanks, Al. I really enjoyed it.