CIDDL: Hello, and welcome to the CIDDL research and practice brief series.

The purpose of this series is to have conversations around the innovative use of technology in special education, early childhood, related services, and leadership personnel preparation programs. Today we have Dr Lisa Dieker as our guest expert.

Dr. Dieker is a Pegasus professor and Lockheed Martin eminent scholar chair at the University of Central Florida in the College of Community, Innovation and Education specializing in exceptional student education. She is the co-director of the Center for Research in Education Simulation Technology, known as CREST.

Her primary area of research focuses on collaboration between general and special education teachers with a specific interest in unique opportunities that exist for students with disabilities in STEM areas in urban and rural settings. She has a passion for how technology and simulators can be used to impact teacher preparation and student learning.

Dr Dieker has received and manages more than $26 million in grant funding, holds three patents, provided over 120 keynotes, has authored six books and over eighty articles and chapters. We are very glad to have you with us today, Dr. Dieker.

Lisa Dieker: Thank you, Michelle for having me. I'm excited to be a featured expert on CIDDL. That's always a little humbling but thank you.

CIDDL: So, to start us off, what are the issues that you were trying to address through your research and work with CREST?

Lisa Dieker: So I think initially, really, the issues that I started being most worried about is -is really teacher preparation, and it really came from the roots of being a daughter of a mechanic.

My dad would always tinker and say- 'you know, there's a solution to any broken car engine part' and I had the privilege of being a part of a symposium kind of thing where for a semester we had funding from the provost to spend a semester thinking, and we started off thinking across four disciplines-not education- about simulation. So I got to go in to a driving simulator and a flight simulator and immediately I started saying, "Well, why do teachers practice on kids?"

"Why don't teachers practice in a simulator? and people were like, "because we don't have one." And, so that became the beginning of CREST, but really and truly, CREST is now blossomed into how do we harness any technology? AI, biometrics, facial tracking, heart rates, whatever might be out there to do two things- help better prepare new teachers and help teachers better understand how kids, with disabilities, kids who are struggling learners, kids in STEM, are doing in their classroom. And I think it's that passion of having multi-disciplines in CREST that have really built this world of ‘let's put this all together’ to make the world a better place for teachers, but most importantly for student learning.

CIDDL: That sounds amazing and very exciting and really aligned with the innovative type of work that CIDDL is trying to do. Could you tell us more about CREST itself and how it's going to address those issues?

Lisa Dieker: Yeah, so CREST really was born out of something that many people know in some of our initial work, which was TeachLive, which was a simulator to train teachers. We've now taken that work and started moving it into AI, hence the name CREST, so the Center for Research in Education Simulation Technology.

Because we, you know, lots of people are doing work in simulation and training, but often it's in flight, it's in military, and I actually see, you know, teaching as a life and death situation for kids especially kids of poverty, kids with disabilities. And so, we're trying to take the work that others are doing and learn from it and learn with them. So we have the privilege of doing a lot of work in the Learning Science cluster with amazing people like Dr. Michelle Taub and Dr. Roger Acevedo, knowing what they're doing with eye motion and vision tracking, and we're trying to say, now, what does that mean for teachers?

What does that mean for students? What does that mean for learning? And so, CREST is really a foundational place for people across disciplines to think about education, simulation, and how technology in general might better impact your population.

CIDDL: So how would someone in the teacher preparation program- how would they fit this into what they're doing?

Lisa Dieker: Yeah, so first of all, CREST stands ready to be partners. You know, I joke that UCF has the trademark- we like to trademark things- "America's Leading Partnership University"- we literally own the trademark for that. But I think the reason we do, that is, we really do live and breathe that. So, there's a plethora of ways, but let me just maybe name three buckets if people were interested. As you know, we do Teach Live still but we only do the research part. That's been commercialized. Mursion is the commercialization partner.

They're doing amazing work across disciplines. We are really just focused on new innovative research. So, if somebody wants to try something that isn't standardized, maybe never been done before, wants to write for funding- we stand ready to do that in TeachLive simulation. We also stand ready to do anything that might be disruptive, like the work we're doing with cyber bullying with artificial intelligence.

Through an NSF grant we have another project where we're working with kids with ASD with a socially assisted robot. And, we have a third, really large, grant where we're tagging teacher behaviors and looking at biometrics to try to help them better understand their neuro-physiological state. So again we'd love partners in any of those spaces.

And then, I think the third one is my favorite part of CREST is -call us.

Whatever you're dreaming about -we'll tell you like, the land mines to stay out of, but we're not afraid to jump off cliffs. I would call us cliff divers on a daily basis.

And sometimes we do a belly flop, just like anybody, and it hurts a little and we learn from that mistake. But if you want to do something innovative either we'll be happy to tell you what we've learned or we'd be happy to partner with you to whatever extent we have expertise to kind of help you move that forward.

CIDDL: That's really exciting. I love the idea of partnerships, and I know there's a lot of other programs that are out there that would benefit from this work. So, looking ahead you've already mentioned a lot of different types of innovations, but where do you think the research is headed when it comes to simulations and these other types of technology?

Lisa Dieker: Well, I always say, you know, when you're thinking- and I know your audience is Higher Ed- when you're wondering where we're heading- two places to look- one, look at the budget. You know, we're already there's a big discussion we're behind on AI. Well, that's what we've been getting a lot of funding lately because again we're not afraid to say this is scary hard - no different than what TeachLive was 14-15 years ago. That was scary hard. We didn't have any funding for a decade. It's nice now to see innovation in teacher-ed kind of get funding, to say we understand, we need to innovate earlier. So, I think where we're heading is, if you watch -if you watch the budget. The second one is- I follow all the national defense magazines because whatever the military is learning is probably going to trickle down to us. I hate to say throw away technology but it's going to become affordable technology, such as eye-tracking, facial tracking. They've been doing that for pilots for decades. They don't give somebody an F 16 fighter plane and say, "please go fly this, you know, $16 billion plane and not know what you're thinking, what you're feeling.

I think that whole innovative idea of understanding - and I think we never want to make our teacher candidates wear these devices. I think we want to give them options, just like when you go to the doctor. Would you like- you know -they take your blood pressure, but then they say, 'would you like blood pressure medication, would you like to have a diet, or do more exercise?' I think we want this kind of data, but we want it to be driven by the human desire, I want to know when I'm stressed if I'm a teacher of kids with behavior disorders, I want to know when I'm only staring at the one kid who will talk to me and I don't notice the rest of the class and they're all doing things that are going to cause me problems because I'm a new teacher and I don't know.

I think those are the kinds of things that are exciting and I just heard a new report- the other one to look at is global. And this would be my last thought here is, you know, there are three areas- I can't tell you, remember them all, but a good Google search will tell you this. AI was one, nano technology was one, and I think it was bio - biotech but, three ways we're behind in the rest of the world. That's a good sign in the teacher-ed space. That's not only where we need to be producing teachers that have knowledge in those skills areas, but we should be following that if we're going to be innovative in our work, because we're trying to catch up, which means there will be funding aligned with that.

CIDDL: I love how you made the connection between the work and those practical applications and we talked about what this really looks like for a teacher and so using those tools to be able to reflect on your own practice. And I think-that's the part where I think people may feel

intimidated by the technology, but it really comes back to like you said, the human element and improving teacher practice.

For a teacher preparation program that again may feel like 'Oh, this is, you know, this is something UCF would do, this is for someone really innovative', what resources and tools would you possibly recommend for somebody who's just getting started?

Lisa Dieker: So I think we have to remember working simulation can be as simple as reading a case study, to watching a video of a classroom, to being in a simulator, to having biometrics in a simulated environment- there's a continuum.

And so, you know, if you're doing a case study, maybe seeing what students look at the longest using eye tracking software. Again, that's out there.

If you've got students who seem to really be struggling with their affect, a great free app called AffDexMe.

The app -they can, they can look at their affect. So I think what we have to do really well right now with technology is, we have to do work with teachers, not to them or for them.

And I think that is a mistake we've made in some of our research. I feel like then TeachLive- we've done that fairly well. Help us, give us feedback, this is wrong, this doesn't seem right.

And now I think in CREST that's what really what our projects are about. But I think there's one more level of that that if I were in a place with limited resources, I would be looking to do some very simple research too with teacher/student relationships.

So there's something called the Vivo smartwatch- (again never endorse a product) I can just tell you we've tried everything from the Apple watch to the Garmin, to the Garmin Vivo to, you name it, the Empatica. This one's $100 but it's one of the few that we've been able to extract the data real time.

The others are amazing but you get the information afterwards. So, I would encourage maybe one purchase of those in the college and have a couple teachers wear them student teaching, have a couple of teachers do some facial tracking, have a couple of teachers step into a simulator if you can do a shared experience with them and have people watch that. So maybe you can only do one hour of simulation time but, having 30 teachers watch it and talk about it.

Keeping it simple and having a very clear, simple research question that you'd like to answer.

What is the heart rate of 15 novice teachers the first time they step into a behavior management sequence?

What's the heart rate of an Intern I student teacher versus an Intern II student teacher? That would take one watch and four students.

Again that's the kind of information I think we're prepared and I always say when you question this, think about a hospital-When a nurse has a board they know exactly what's happening and we don't even know it's being done to us but we're glad they know.

That's what we need to get in the teacher-ed space, and I think each piece of that data- just something simple like comparing an Intern I to Intern II is helping inform the field in a way to move us forward quickly.

CIDDL: That's so exciting and I really personally resonate with the idea of doing things with people as opposed to to them, so I love, how you framed the work in that context.

Anything else that we should know moving forward- any last thoughts?

Lisa Dieker: Yeah, I think anytime you fear technology, I would encourage you to not assume you need to learn it. Hang out with people from other disciplines that already know it.

I'm not innovative because I'm smart - I'm innovative because I'm collaborative.

And you know, I hang out with people that understand coding and back channels and biometrics and eye-tracking. But I also know that they now know so much more about teacher education.

And they're better professors and teachers and think deeply about the work we do.

And I know so much more about the work they do. So, I would just say that you know I think interdisciplinary work is good but I think if we're really going to move forward and change the world for teacher-ed we've got to become trans-disciplinary.

And one of my friends once said, it’s like an apple pie. You can no longer pick it apart, but it sure tastes good when it's all together.

And that's what I feel like if you're if you fear it there is some new junior faculty member on your campus saying, “I need tenure”, and getting a publication in education with something innovative is easy as long as it's not scary.

So don't do something crazy. Don't do something scary. Trust me, I've been on that road, but do something simple, clean, and smart with that person. Learn from them, build that relationship, and I think leading our discipline is where we're really going to grow.

CIDDL: Well, Dr. Dieker, I cannot thank you enough. I think that what you have shared with us again just completely aligns with the innovation that we want to bring to teacher preparation. So, I’d like to thank you for sharing about CREST today. We appreciate your time and we hope for additional opportunities to hear more about where this is moving the future.

For more information about CIDDL research and practice groups and other resources for teacher education and related services personal preparation, please go to CIDDL.org. Don't forget to

follow us on social media, subscribe to our channel, and leave us a message. Thank you all for joining us.

Lisa Dieker: Thank you, Michelle I appreciate the opportunity.