Transcript Charla 004: James Frazee

Perette: Welcome to *Fireside Charla* with Dr. Adela de la Torre, President of SDSU where we prepare the global citizens, compassionate leaders, and ethical innovators who will solve the world's greatest challenges. Today's charla is all about innovation in teaching, transforming instruction, and reinventing the classroom to educate the students who will become the leaders of the future, a key priority in President de la Torre's vision. Now let's listen in as President de la Torre introduces us to three of our superstar innovators who are accomplishing just that. *Fireside Charla* starts now.

Adela: I'm very excited to welcome everyone to today's charla. Today I'm here with Dr. James P. Frazee who serves SDSU as the Senior Academic Technology Officer and director of Instructional Technology Services. James, what does that mean?

James: So, ITS serves faculty by helping them use technologies for teaching. We do that in a variety of ways: in our built environments, in the classrooms that faculty teach in, whether that be small seminar rooms, laboratories, or larger auditorium. We also help faculty with virtual technologies for teaching, the Learning Management System being the primary one. We use a variety of technologies that integrate within the Learning Management System and we support all of those, whether they're assessment technologies to help faculty use tools to gather information from their students, or to get students connecting with one another in the content or with the instructor more. And we also provide creative services to the campus, things like graphic design, video productions, streaming, and beyond.

Adela: Well, thank you, James. Could you tell us a little bit about our guests today?

James: Sure, yeah, you know, I know the topic is about innovative teaching and learning, and it really requires people and we're so happy to have both Harsimran Baweja, professor of physical therapy who is a neuroscientist and faculty Fellow at ITS and Katie Hughes, a instructor in our Rhetoric and Writing Studies department who's helped us with a lot of community building with our faculty, and getting faculty sharing examples and ideas with each other. So welcome, Sim and Katie, thank you for being here.

Adela: So Katie, can you tell us a little bit about yourself and what you do here at San Diego State?

Katie: Well, I wear many hats here at San Diego State. I teach Writing and Rhetoric in the Writing and Rhetoric Studies Department. But in the context of today's talk, I am a faculty fellow with ITS and in that capacity, focus on building community amongst faculty in our course design institute where we help faculty learn how to teach online courses in a quality way. And as well in our learning research studios, which are active learning classrooms, which we have a handful of, and we'd love to have more because they are very exciting and innovative classroom spaces for teaching in a very hands-on kind of way and really enhancing student learning.

Adela: So Katie, can you explain what active learning is?

Katie: Active learning is sort of focused more on students doing rather than sitting passively and listening to somebody communicate information. So our classrooms are designed specifically with the purpose of maximizing interaction between students and also between instructors and their students. And so there's a lot of collaboration, a lot of doing, active (I'm going to repeat the word) but it's an innovative way to teach because students are actually applying what they're learning to either simulated situations or researched information that they have worked together to find and creating together in the classroom rather than sitting there and listening and then going home by themselves and doing things independently.

James: I would just add that, you know, one of the key components is providing students with really authentic complex tasks, problem solving, decision making tasks, tasks that require students to work with one another, to solve a problem or to create something. So we're trying to create environments, physical environments, that are very collaboration minded. The chairs can be repositioned, the tables are conveniently rearranged and maybe they're belly height tables or cafe height table so that they're really geared towards team-based learning and project-based learning. And the technology that we provide in these spaces is also lending itself to students sharing information easily with one another and with the entire class. So there may be multiple displays. Students who are on a small team can be sharing a display and another team across the room can be working independently on another display. And then the instructor can say, "Okay, Adela, let me hear what your team has come up with. And let's see that" and they can share that display with all of the other displays in the room really easily. And that's the key component for us at ITS is to make this really easy for the faculty so that they don't have to focus on what button to push or knob to turn. It's really intuitive and they can just focus on their content.

Adela: So Sim, if you think about what you're doing in the classroom, perhaps you can give us an overview of what you're doing as well as if active learning plays an important role in what you do as well.

Sim: Absolutely. So I'm a professor of physical therapy over here at San Diego State. At heart, I'm a mad scientist, so put that together and you can push some limits over here. So in my classrooms, I teach neurophysiology to physical therapy students in their first year. One of the problems that I had as a student 20 years ago was, the brain is a three dimensional object, but it was taught in two dimensions to me, it was drawn on a blackboard, literally a blackboard with chalk on it. But now how we teach it in our classrooms is with holograms. So we can actually project holograms, which are on every screen at the same time (I'm using an iPad from my professor's desk) and we use an iPad to project a hologram in front and we can move it around, disassemble it, do a neuroanatomy kind of a lecture over there, which the students are engaged in firsthand, and then they can actually interact with me through there, through that environment. So those are the kinds of things that now force students to be actively engaged. So that's an active learning classroom, otherwise back in my time, and I sound very old saying that, it was a one-sided lecture. You were being professed *at*, and it wasn't a discussion. So an active learning classroom now has changed that characteristic of a class. It's a discussion rather than me talking in one direction with my students, which makes it more engaging for both sides.

Adela: So could you give me an example of something that we've done at San Diego State that is really unique and impacting students in terms of innovation, something that we've been cutting edge in?

James: Sure. I think a great example of a of an area where we've been experimenting and innovating and incubating is with the Learning Glass technology. Thanks to Professor Matt Anderson, a physics professor here who is the inventor of this technology, we've made that technology available to universities across the planet really to take advantage of this technology. Essentially, it's a glass board that has lighting, LED lighting around the edges of the board, and it allows the instructor to write just normally like they would on a whiteboard or a chalkboard from left to right, normally, and thanks to this technology it flips that horizontally so that the viewer who's looking at this, it would appear as if the instructor was writing backwards. So, they can see exactly what the instructor's writing. And the difference between something like the Khan Academy where you see somebody writing on a document camera or something like that is you get to see the instructor's face, you can see their non-verbal expressions,

and it makes the instructor much more present. And that can have an impact on students and their perception of the instructor.

And at San Diego State we've we've taken it a step further with this learning glass. There's actually a live studio audience. So the instructor's writing- instead of turning their back on the audience and writing on the whiteboard or the chalkboard as they would normally, they're actually facing the audience while they're writing on the board. The proper orientation is on displays next to the instructor and the instructor can see the students and pick up on a puzzled look or a raised hand that they would never be able to see normally if they were writing on a conventional whiteboard. This is technology we've made open source, in the University of California they've really ran with this, especially at UC San Diego, where we met with them and we shared all of our build instructions and all of our design documentation. And now we're seeing it, I think, at almost all of the University of California system schools. In fact, they've got a Learning Glass across the UC's website, which has attribution to San Diego State and ITS which I think speaks volumes, because, you know, I think imitation is the most sincere form of flattery, right? And so this technology has really taken off. And I think it speaks to our spirit of openness. We didn't want to make this proprietary. We wanted to make it freely available for anyone around the planet. And so we're seeing that used now in K-12 institutions as well as higher education institutions. And it's something we're really excited to share with the world.

Adela: That's exciting. And Sim, you were going to mention something?

Sim: Oh yeah. So we use virtual reality in our astronomy classrooms for example. Back in the day, it was taught using popsicles and a table lamp, phases of the moon. So you would have a table lamp in a dark room, and you'd hold a popsicle in front of it, and move a popsicle around to imagine what the phases of the moon would be like. And so the professor would want to ask and see if you have conceptualized what just happened. And so they'd ask "if the moon is in a waning gibbous, what does the earth look like?" And that would puzzle a lot of students. Now, using virtual reality, we have this application where you can actually stand on top of Earth, hold the moon, move it around to see what it would look like when it was going through its phases. And then you could walk to the moon, turn around and look at Earth and see what the Earth would look like when it was in a waning gibbous, and that makes sense to everybody.

Adela: So one of the things we really pride ourselves on at San Diego State is that we're really focused on all students. And we have a very diverse population. How do we handle the diversity in the classroom? Using these different tools so that they can all be

successful whether they're in a STEM field, whether they're in literature or arts? What are the strategies that you think are the best ones that we've learned from? Katie, what do you think?

Katie: Well, I think going back to the learning research studio classrooms, it's an excellent venue for sort of leveling the playing field because people are in groups, as James was explaining, the furniture is literally grouped and movable. So it's really easy to put people together and have them collaborate whereas in a regular classroom, people have a more isolated experience. And so what I see so often is that as an instructor, I can sort of back away and become more of a facilitator and they instruct each other a lot because they just become engaged and even the shyest students end up participating at much higher levels than previously. And a lot of the barriers kind of disappear once they're engaged in that process.

Adela: So in terms of the gap between different groups, so we have different students coming, first generation students, we have students who are low income, how do you work with those students beyond just the active learning to make sure they're successful and that they really get the best experience in the classroom?

Sim: There are various ways of doing that. I'll go towards the vital example which we call the virtual immersive teaching and learning. It allows you in different ways- there are examples that have been used in education and within our university, we're using virtual immersive environments in different classrooms. And one of the initial studies that was the precursor to us thinking about it was done by HTC Vive I think, or HTC Vive sponsored that for another university, where they showed that students who are trailing in class, the C and Ds in the class, those who would drop out and those who were failing the class, when they were given immersive content, and they were helped to imagine it, context was added to what they were being taught, it was visualized better for them versus forcing them to imagine that the brain looks like this, for example. It was being shown to them, this is what it looks like. It helped them better and brought their grades up to the A's and B's. So that's how you can close the gap if the class is diverse in terms of struggling students versus those who are doing well in class.

I think the instructional technology services over here also has a Supplemental Instruction Program, where students who have already been successful in these classes, come back and teach those who are struggling in these classes, which helps them learn better, at the same time it takes those other students working with their own colleagues and helps them work better. I think James will have a better insight on the SI program than I do.

James: Yeah, sure. I mean, one of the things that we focus on is making sure we have a rich mix of students that represent a broad perspective so that the students, and these are often very large, high enrollment classes that are historically challenging, classes where it's not unusual for 40% of the students to have to repeat, classes like organic chemistry come quickly to mind in that regard. And we want to get students who've been previously successful, who look like their fellow students, we don't want it to have the look of the instructor let's say, we want to make sure that we have a rich mix of students that other students can relate to. And it's a voluntary program. So they're going to be more likely to volunteer their time to go and meet with these students who are the facilitators, if they're somebody that they can relate to and they can identify with. The other thing I want to mention in terms of helping us help students who may be first generation students or students who may be economically challenged is a lot of work around making sure that students have affordable instructional materials and we've been doing that in a variety of ways. One of the most important I think, is by celebrating and recognizing faculty who are using open educational resources, and free or more affordable electronic content, providing lots of examples for other faculty who may not know the different options that are available to them.

You know, one example is the library is paying a lot of money for journal articles and other resources that are woefully underutilized. So we're trying to celebrate the faculty who are taking advantage of some of those resources. It's not only amortizing the cost for the university, but it's also making it more affordable for the students. So we've got a variety of programs. You've been very gracious with your time to help us recognize faculty who have moved in that direction. And I think that's helping a lot in terms of those students, because it's reducing one of the key barriers that's standing between them and being successful is having the materials they need to to do well in that particular course.

Adela: So one of the areas that I think is pretty exciting, James, is the area of digital interactive material. And I know that we've been using it. But we haven't been using it as much as we could use it. What are the real barriers for faculty when we talk about use of digital content? What are the things that we need to do? And what are the things we are doing to get faculty engaged?

James: Yeah, I'll just say that, you know, one of the things that we're seeing more and more of in terms of digital content is the use of video. And as instructors look to flip the classroom, or sometimes people say invert the classroom, which is to say, they provide content that they would have lectured and provide in a kind of a one-way transmission

in class, they provide that material prior to class with the idea that the students are going to spend the time in class applying that information in some more meaningful ways with one another, often through some interaction with each other.

The challenge has been getting the students to engage with those videos ahead of time and one of the things that we're doing right now that we're really excited about is in-video quizzing. So making sure that not only the students are watching the video, but they're interacting with that content, that they're given an opportunity to check their knowledge as they're watching the videos, and automating that so that those scores are going right into the Learning Management System. So there's not a whole lot of overhead for the instructor. The instructor is curating the videos, in some cases they're producing the videos. And there's some assurance that the students are watching those videos ahead of time because the students are getting points for it. And that enables the instructor to know that the students have a strong foundation or footing when they come to class.

The other thing that's really interesting is by providing recordings of content that's provided in class to students so that they can review that outside of class. We call that “Capture” and that's one of the services ITS provides to the campus. Not only do students get to review their, or rewind their professor, but it also provides kind of a digital breadcrumb trail to be able to tell the instructor not only who's watching, when they're watching, how long they watch, what device they used to watch, but most importantly, what did they rewind? If every, you know, six minutes and eighteen seconds, you can see and we can show this with a heat map, that it looks like everybody's rewinding this particular chunk of the content, that's really important for the instructor to know. Maybe they need to provide another example or more practice, or another chance for the students to interact with that particular concept that they were sharing. And that's really important data that can inform the instructional design of the course. So the nice thing with some of these technologies providing the content in this digital form, is not only does it help students, let's say for whom English is a second language, it also helps the instructor know what people are bumping up against, and that's something we're really excited about.

Adela: So I want to turn to assessment because what we’re really talking about is changing assessment as well, when we talk about use of digital content, using different methods in terms of evaluating students. How does that really change your classrooms? And this is really focused at both Katie and Sim, how have you looked at assessment? Is it midterm, final, that's it? How you looking at making sure your students are successful in the classroom?

Katie: Well, since I teach writing, I don't really have tests, per-se exams, it's papers and projects. And I think something that we are really big on in ITS, when we teach people, especially with online courses, is to have many smaller assessments rather than, you know, two or three very large ones. And that seems to produce better learning for one thing, less stress and anxiety, less cheating, because it's just not worth it to get so worked up over many small things as opposed to if all the eggs are in one basket at the end, and then things can go awry. So that's, for me, I have many process-based projects where there are steps along the way that get formative assessment. And you know, they earn points, but it isn't just a big paper at the end. And I think you know, that enhances the ability to do well.

Sim: Exactly, yeah, so that's exactly what I do. But when I was shaping my class, I was thinking about it as a neuroscientist, how is the brain learning? What's going to make it stick more? And so in my class, starting week three, students start having a weekly quiz that is going to account for 5% of their grade. We do 11 of such quizzes, and we drop the lowest score. So they have 10 such quizzes, that's 50% of the score of the class. And because what I'm teaching is a grad class, then they have to write an article, which is going to be a group-based project, and then they have to come as a group and present that. And those account for another 30% of the class with the final being only 20%. So your life doesn't depend on a midterm and a final. And we're talking about a 1,000 page textbook we discovered over the span of a semester in grad school, and then they may or may not go back and look at it. So that content being tested in two exams, a midterm and final, is not fair to the students and the brain's not going to stick anything. It's going to be regurgitation competition, rather than "what did I understand and learn and accomplish in that content." So that's just the way Katie described, that's exactly how I structure my classes. And we test them once every week.

Adela: So it sounds like to me that really the key is really trying to procreate, this incremental approach, really doing assessment gradually so students can really get a sense of where they are, they can go back if they need to, find a way to correct that misunderstanding, have the conversation with you, and really humanize the process so that they can become successful in the classroom. So at the end of the day, what is the goal that you really want to have through this new process of teaching, and what is it that we want to see from our students?

James: Yeah, I mean, we're really leveraging what we know about how people learn through learning sciences. This idea of more frequent, low stakes assessment speaks to what they call distributed practice or retrieval practice, getting students to interact with

the content more often than just preparing for a midterm or final exam. We're trying to leverage that and help faculty get lots of examples of how other professors are using this approach in their classes successfully, especially again, in classes where it's not unusual for us to see over a quarter of the class have to repeat the class, things like calculus and some of the more often STEM discipline content.

And so that's something that through the Course Design Institute that Katie is a key facilitator in we really emphasize getting faculty talking with other faculty about not only using things like more frequent low stakes assessment, but what does that allow them to do that maybe they wouldn't be able to do otherwise. And it's interesting. We've seen faculty come back after going through the Course Design Institute and say, “teaching online helped me become a better teacher.” And these are people who, you know, have advanced degrees, often a doctoral degree in their discipline, but they haven't had a lot of background in pedagogy and good teaching and learning. So through things like the Course Design Institute, we can give them that foundation. And then it translates not only to their online classes, but also to their face-to-face classes as well. And that's something we're really excited about.

Katie: I'd like to add something also about the student end of that, that I think we emphasize a lot with that process oriented approach, the application of their learning to things beyond the university and a textbook and a test, you know, so that there's a reason that they understand why they're learning what they're learning. And they're invested in it more as something that's going to matter to them post-graduation.

Sim: Exactly, critical thinking. Because I'm training physical therapists, these guys will be licensed tomorrow and there'll be treating you and me. So it matters to me that it's not just point at the brain and tell me where it is, rather what does it do? How does a dysfunction of a certain area of the brain change what's happening? Think about it, go backwards, reverse engineer the process. If I told you the function, think about the dysfunction. So applying that critically is what our students get also out of our classes.

Adela: You know, I think it's really important. I remember my best instructor when I was in graduate school was my statistics professor. And he really fought against the trend about memorizing formulas. What he really wanted us to do was organize our information so that we could extract it when we need it. So we actually had open-book exams (this is a long time ago). And we had open-book exams but what he wanted us to do was organize information so we can access it quickly. And this is before computers. But it stuck with me because it really is important to understand that the critical thinking, the organizational skills and the ability to extract information in a

meaningful way is really important for our students. And I think that's exactly what you're doing with what you're doing every single day, it's thinking about the whole student, not just the content for that moment, because when the class is done, we know that content isn't necessarily kept, but if they know how to access content and use it, it can really stay for a long time. So it's great to see that you're working in that way.

So, as you move forward, where are we going in this area? What do you see the future holds for us in this area to make sure that we are always at the cutting edge of innovation, and helping our students moving forward in their roles as human beings, as leaders, as business people, teachers, as public officials?

James: One of the things I would love to see is us providing more active learning environments for our larger, lower division general education courses. Right now, most of those courses are being taught in 500 seat lecture halls, which are aptly named lecture halls, because the seats are all bolted to the ground facing in one direction. We can imagine a future where we have larger environments that would still accommodate that size of a course, but they would also allow students to be working in small teams doing more authentic problem solving, like we were talking about earlier, and doing that so that when they're in the world outside of school, they know what it means to contribute to a team, they know what it means to work interdependently with one another, and we shouldn't wait, I think, until their seminar classes, until their upper division major courses, to give them those experiences.

And it's interesting because the students who are coming up from high school are often doing a lot of that work in high school now: they're working in small teams, they're taking on community-based work, doing problem solving, maybe it has to do with environmental challenges that we're facing here regionally. And then they come to the university, and they're getting a more kind of conventional or traditional educational experience at least in that you know, first couple years in those lower division GE classes. So I would like to see us innovate in that regard and provide more flexible technology, rich learning environments that support these lower division general ed classes.

Adela: Katie?

Katie: What he said. Well, since I deal with smaller classes, that's not my immediate concern. But my thing is spreading the word to faculty about the possibilities because I think you mentioned earlier what might be blocks for faculty or how can we help them? And that's something ITS really works hard to do is have lots of workshops, lots of

events; we partner with the library, we partner with CTL (Center for Teaching and Learning). And even just walking down the hallways and conversing to let them know what options are out there because I think what can happen, the danger is that people get stuck into their sort of habits of how they do something without realizing what the options are that are out there. So I just like to talk a lot. Tell people what we can do, and get ideas and, you know, hear what other people are doing and share.

Sim: It's important to first have professors realize we're teaching the future. And the future is catching up with us very quickly. Our students are smarter than most technologically, they're way more advanced than we are. If we realize that and then we train our professors to be adapted to that technology it will bring everybody at par at the same time because we are teaching them where they're already experts at certain things that they could teach us.

James: I just want to add, I think you're spot on Sim, that one of the things that we're seeing is that this can reinvigorate faculty who are mid-career and late-career faculty, and give them a new lease on their professorship and get them excited to be learning with their students, and it changes the dynamic completely. And that's something that's really exciting.

Adela: Well, I want to thank all of you today, this has been an amazing conversation and charla that we've had today on innovation and teaching. San Diego State has been one of the top 60 institutions in US News and World Report. We've also been able to narrow the gap across different groups, and are number one in the country when we look at diverse populations. And in so many different areas, we have really ranked very, very high in terms of our impact on our students. I see the future as a positive future based on the kind of work that you're doing in the classroom and I'm certain with the continued success of what you're doing today as well as your colleagues, we are really going to make inroads to make sure that our students will become compassionate leaders, ethical innovators, and global citizens. So I want to thank you all today.

James and Sim: Thank you.

Katie: Thank you.

Perette: Thank you for being a part of *Fireside Charla*. Next month, we bring you a very special episode called "Nine Questions with the Ninth President," inspired by her recent trip to Asia. SDSU student Ethan Garcia chats with the president about fun stuff like what type of food she discovered during her travels to the more serious topic of why

creating bi-national relationships is good for SDSU's stature as a leading global institution. Remember that you can access transcripts, join the conversation and connect with President de la Torre at sdsu.edu/firesidecharla. This is Perette Godwin, proud alum, hoping that you are inspired to innovate and have some interesting charlas of your own.

Narrator: *Fireside Charla* is recorded at KPBS studios. Our Senior Producer and Managing Editor is Maria Keckler, our Operations Manager is Lisa Morrisette, original music and editing is by SDSU student Kevin Krick. And for their help and creative input we give special thanks to: Tom Karlo, John Decker, Perette Godwin, Brittany Santos-Derieg, Luis Murillo, La Monica Everett-Haynes, Joyce Gattas, Michele LaGrandeur, Kelly Woodhouse, Jeff Ernst, Scott Hargrove, Sean Hawes, Ethan Garcia, Dan Montoya, Travis McCauley, Luke Wood, Coleen Geraghty, James Tarbox, James Frazee, Cory Marshall, Kao Saechao, Rudy Arias, Uriel Avila Zuniga, Katie May, Angela Odis Brawner, Seth Mallios, and to you for listening and sharing this podcast with others.

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