Opportunities from Disruption - How lifelong learning helped create more connected classrooms

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Krishna Pakala, Ph.D, is an Assistant Professor in the Department of Mechanical and Biomedical Engineering at Boise State University (Boise, Idaho) where he has been since 2012. He is the Faculty in Residence for the Engineering and Innovation Living Learning Community. He is the Director for the Industrial Assessment Center at Boise State University. He served as the inaugural Faculty Associate for Mobile Learning and as the Faculty Associate for Accessibility and Universal Design for Learning. He has a Ph.D. in Mechanical Engineering from the University of Wyoming (Laramie, Wyoming). He has approximately 25 publications/presentations. He is a member of the American Society for Engineering Education (ASEE). He is the recipient of David S. Taylor Service to Students Award and Golden Apple Award from Boise State University. He is also the recipient of ASEE Pacific Northwest Section (PNW) Outstanding Teaching Award, ASEE Mechanical Engineering division's Outstanding New Educator Award and several course design awards. He serves as the campus representative (ASEE) for Boise State University and as the Chair-Elect for the ASEE PNW Section. His academic research interests include innovative teaching and learning strategies, use of emerging technologies, and mobile teaching and learning strategies.

Dr. Sreyoshi Bhaduri, Society of Women Engineers

Dr. Sreyoshi Bhaduri is an Engineering Educator and Research Scientist. She currently serves as a Senator at the Society of Women Engineers - a global not-for-profit organization with over 40,000 global members and the world's largest advocate for women in engineering and technology. Dr. Bhaduri has an interdisciplinary expertise with a Ph.D. in Engineering Education and Masters degrees in Statistics and Mechanical Engineering, from Virginia Tech. Her research interests include: future of work, women in technology, assessing the impact and effectiveness of inclusion and diversity initiatives as well as employing innovative, ethical and inclusive mixed-methods research approaches to uncovering insights about the 21st century workforce.

Opportunities from Disruption
-how lifelong learning can help create more connected classrooms

Abstract
The coronavirus pandemic has led to instructors worldwide seeking ways to engage students better through virtual platforms. As the world interacts online, more than ever before, this paper reflects on an educator's experience with the virtual teaching and learning spaces pre and during the ongoing pandemic.

Let's talk about:

Opportunities from Disruption –

how lifelong learning can help create more connected classrooms

Dr. Krishna Pakala   Dr. Sreyoshi Bhaduri

Autoethnography is a research methodology that analyzes a phenomenon through the use of self-narratives, which would otherwise remain private or buried. This paper uses an autoethnographic approach to describe first-hand. the experiences and learnings of an educator at a Western US Public University.

This paper describes how first as an international student, then as a first generation PhD, and finally as a professor facing immigration related challenges, the author has had to pivot to online teaching multiple times before. Such virtual interactions with students was atypical at that time. However, lessons learned from those online interactions helped the educator better prepare and pivot to online during the pandemic.

Overview of the presentation

This research paper will cover three main sections - first, we will provide some background for this work. Next, we will elaborate on why we chose autoethnography as our method of choice. Finally, we will present some results leading to recommendations for universities as well as departments.

So, let us start with some introductions.

meet Krishna...

Engineer. + **Educator.** + **Researcher.**
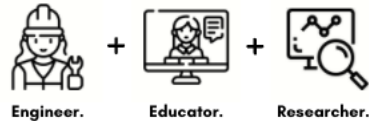
Dr. Krishna Pakala is a trained as an engineer. He works as an educator - as Assistant Professor in a state university in the United States. Krishna is also a researcher interested in studying how to better learning experiences for students in engineering classrooms.

"Ability is what you're capable of doing. Motivation determines what you do. Attitude determines how well you do it."

LOU HOLTZ

A quote from Lou Holtz which attributes attitude as determinant of how well one does one's work - sums up Krishna's philosophy towards education, teaching, research, and accomplishment.

committed to student success

In his own words,

"*As a mechanical engineering education researcher my goal is to transform engineering education to support student success inside and outside the classroom. I am constantly seeking to improve the student learning experience. I take a student-centered approach to education, where I have adopted evidence-based instruction and integrated these approaches with mobile technologies and social network platforms. As teachers, we can guide students' discoveries and change the trajectory of their lives. In the process, I am continually blessed to be able to nurture the learning of the next generation of engineers that will contribute to our society. Throughout all my activities, my continual focus has been on building community, providing students a scaffold for learning, facilitating their emotional and intellectual growth, and being an integral part of their journey from a novice engineering student to a skilled and confident engineer.*

I strive to engage my students in such a way that they become much more self-aware, empowered, and confident — so that they persevere when trying to solve difficult problems — rather than becoming frustrated and not believing in their ability to learn.

I strive to make myself available to my students whenever they need me including virtual office hours. I continue to leverage technology to enhance student learning by elevating pedagogy and always keep in mind this quote from former Secretary of Education Richard Riley, "We are currently preparing students for jobs that don't yet exist, using technologies that haven't been invented, in order to solve problems that we don't even know are problems yet."
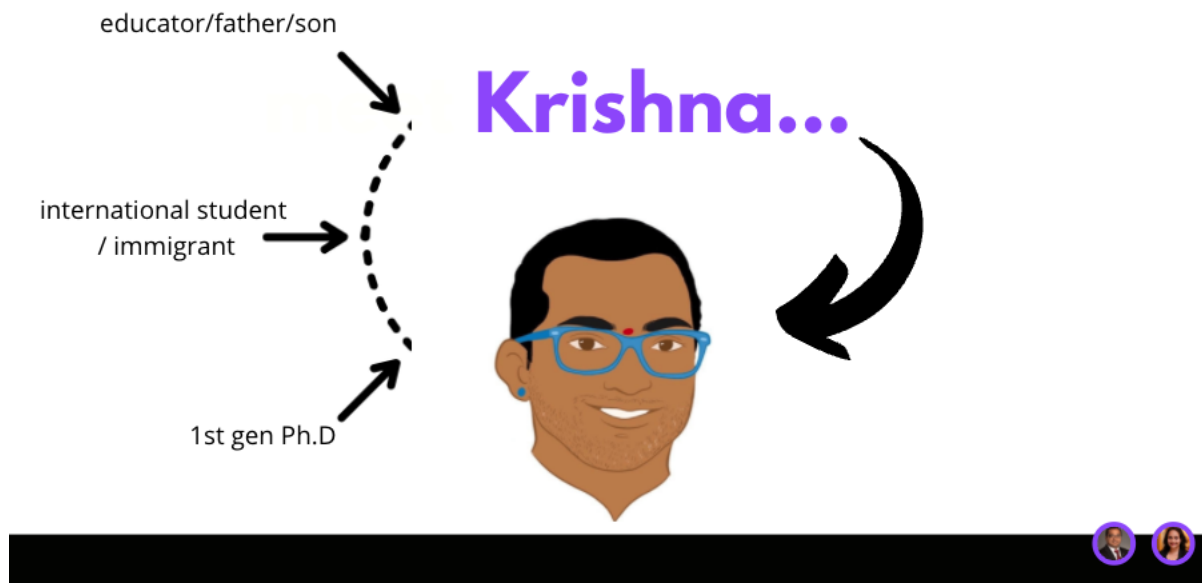
Like most in the professoriate here in the U.S., Krishna also received doctoral education. In addition to being a doctoral student and learning and researching on mechanical engineering, Krishna was an international graduate student learning to navigate a different country, language, holidays and customs, and a bevvy on visa related issues.

Even as a child, Krishna knew that he would grow up to teach students. In his reflections, he notes: "my career path to education always felt inevitable. I was born on "Teacher's Day" - a celebration in India dedicated to educators. I was often reminded of this fact by my grandmother, who hoped I would continue my grandfather's legacy of serving students in the classroom. During my own undergraduate and graduate education, I had the privilege of being taught by teachers who transcended the all too common lecture — they enabled learning by engaging students in critical thinking and conceptualization. These experiences and my own interactions with several great mentors fueled my passion to make a lifelong commitment to educating our next generations. "

What he did not know was that he would be teaching 7000 miles away from his homeland, while living through a pandemic.

The corona virus pandemic hit the US in March 2020. Almost overnight classrooms turned exclusively online. Instructors hurried to provide the best possible learning experience for their students, while also witnessing life-changing events in and around themselves.

As the world interacts online, more than ever before, this presentation presents research understanding the experiences of Krishna, an educator with the virtual teaching and learning spaces pre- and during the ongoing pandemic.

The purpose of this research, thus, was to use an auto-ethnographic approach to help Krishna reflect on his experiences as an academic in the US through the pandemic struggling to create an engaging and inclusive learning experience for his students.

Additionally, his reflections also contribute to this broader narrative highlighting his experiences in academia in these times as an international, immigrating, educator of color, who was the first in his family to receive graduate education, and who continues to weather the wrath of the pandemic separated by many thousand miles from his family.


Creswell and Creswell (2017) describe auto-ethnography as a research methodology that analyzes a phenomenon through the use of self-narratives, which would otherwise remain "private or buried." Auto-ethnography was an appropriate strategy to use in this study because it provides the primary authors the opportunity to shift from being an outsider to an insider in the research, which further enables their voices to be better heard within the community, thus promoting convergence and inclusion.

Similar to Matusovich, Murzi, Gray, Chambers and James (2020) we undertook an analytical autoethnography approach, borrowing from Anderson (2006), and focused on pragmatic reflections and takeaways rather than merely emotions related to a phenomenon. We were intentional about keeping the reflections pragmatic so that this reflection may be of use to administrators and fellow educators. The protocol thus did not seek to elicit or ask the participant to emphasize on the emotional aspects of the context of the pandemic on the participant, although inevitably and as expected, responses mirrored the participant's state of mind at various points through their experiencing of the pandemic.

Auto-ethnography *involves...*

"a critical study of yourself in relation to
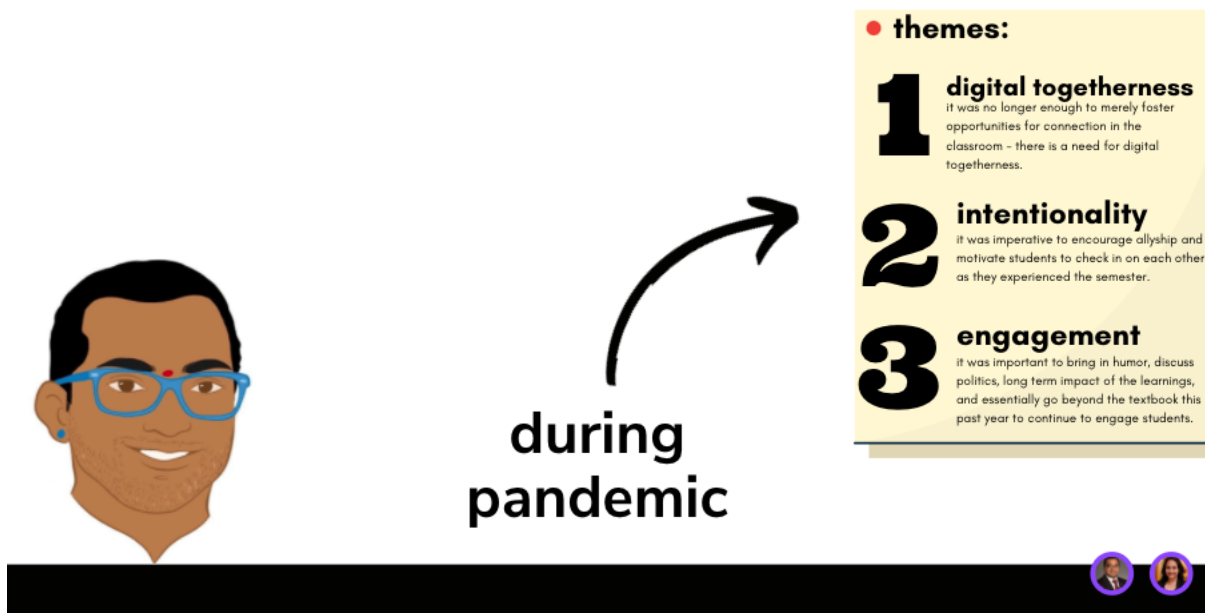one or more cultural contexts."

REED-DANAHAY, 1997
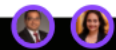
Research began with a reflection protocol which was developed collaboratively during multiple meetings and eventually generated several pages of documents from the primary author who completed this reflection assignment. The protocol was intentionally kept broad and general and did not align with any specific Theoretical Framework (such as those related to Identity Development or Motivation), thus allowing reflections to be grounded in the insights of the participants' experiences, and the themes to be emergent and analysis exploratory.

pre- pandemic
&
during pandemic
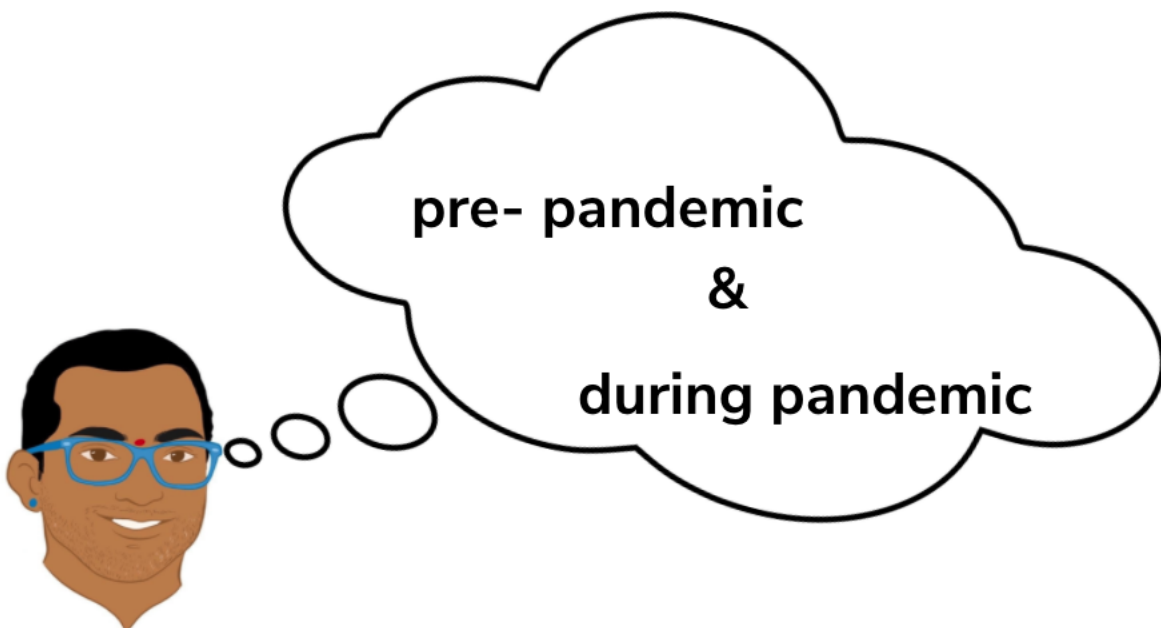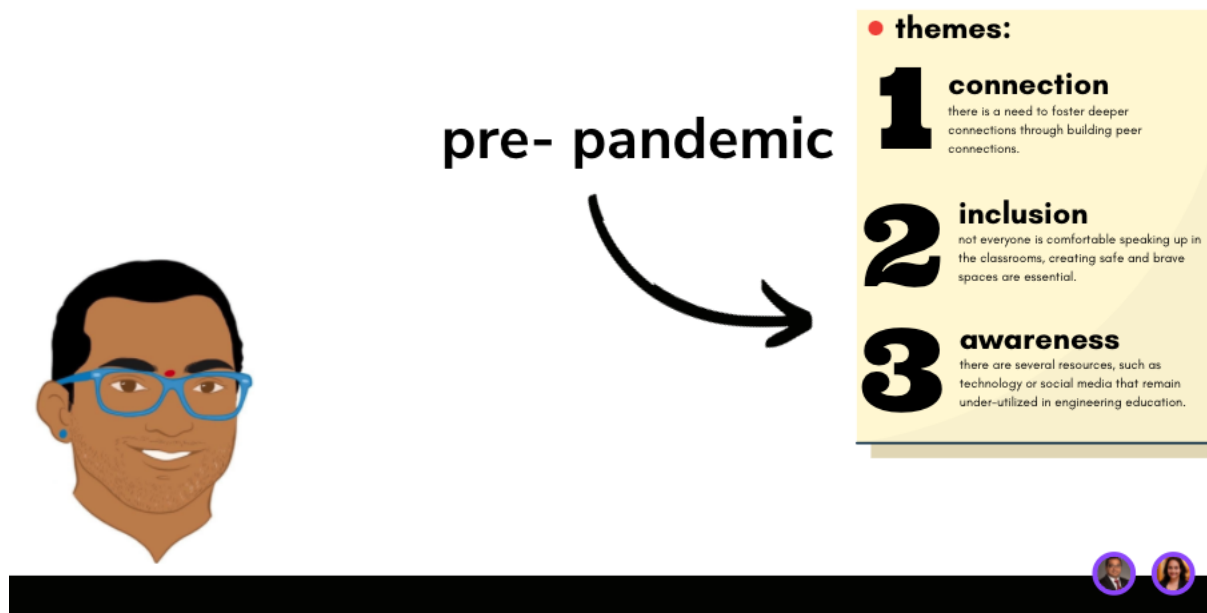
Three major themes emerged from analyzing teaching reflections on strategies that Krishna had employed pre-covid.

Reflecting on one approach that encompasses all three strategies, Krishna reflects, "*One area I chose to revitalize is the usage of traditional "office hours" - I wanted to breakdown the learning barriers with virtual office space. This was rare at my institute pre-pandemic. For educators and students, the traditional office hour is a well-intended measure plagued with limitations. Physical space is finite, the schedules of dozens of students prohibit cohesive and diverse participation, and the voices that dominate in the classroom often continue to do so outside of it, to the detriment of less vocal students. To address this issue I created Happy Hour: an innovative virtual space that leverages technology to elevate pedagogy and student success. Using the video chat platform Zoom, I initiate Happy Hour twice a week with an iPad. Students join via Zoom and are able to watch, participate, comment and use the chat function to engage with each other around an engineering problem for a maximized learning experience. Every Happy Hour is recorded, an especially beneficial function for students whose schedules did not allow them to participate, or those who wish to revisit the material. Student participation is not mandatory, but can be counted towards the number of peer educator sessions for the class. For me, Happy Hour offers greater opportunity for the students in my engineering classes to ask questions, learn from one another and create a positive learning community outside of the classroom that then carries over to the classroom experience.*"

themes:

1 digital togetherness
it was no longer enough to merely foster opportunities for connection in the classroom – there is a need for digital togetherness.

2 intentionality
it was imperative to encourage allyship and motivate students to check in on each other as they experienced the semester.

3 engagement
it was important to bring in humor, discuss politics, long term impact of the learnings, and essentially go beyond the textbook this past year to continue to engage students.

during pandemic

In 2020, the United States grappled with two major challenges – one of the unprecedented coronavirus pandemic and the other of the long ongoing racism that was highlighted through the extrajudicial killings of George Floyd, Breanna Taylor, Ahmed Arbrey, and others. Guillory (2020) aptly introduces these catastrophies as – ""How did you go bankrupt?!" Bill asked. "Two ways," Mike said. "Gradually and then suddenly" – Hemmingway. This oft referenced phrase aptly describes how substantial changes that take a long time to develop can appear to happen all at once. The extrajudicial killings of George Floyd, Breanna Taylor, Ahmed Arbrey, Tony McDade, and others, in combination with a poorly-managed pandemic that is disproportionately damaging the Black community, has poured gas on a growing blaze, calling on us to truly address the extent of anti-Black systemic racism in the United States and abroad."

As the world shut down in March 2020, Krishna took on the role of the "Pandemic Professor of Engineering, & utilized the far-reaching capabilities of digital technology to continue students' learning seamlessly. He was committed to being inclusive, and offer support for all students especially those from under-represented and marginalized communities. He used the functionalities provided by commonly used social media platforms such as Twitter, Instagram, LinkedIn, and Facebook to reach out and maintain human connections. The broader goal was to embrace digital togetherness to bridge the gaps caused by social distancing.

He reflected: "*I realized it was important to reach out to not just students in my engineering Heat Transfer course, but to also train students to reach out to each other and to their instructors in other courses. I trained colleagues at my department and college on how to use digital means to connect with students and the community. I offered several opportunities for training on technology to aid in learning and teaching for students and faculty. My virtual face-to-face "Teaching and Learning Online" training sessions were attended by several of my*

colleagues at the college of engineering. I also taught digital teaching and learning training sessions for the campus community. Further, students who lived in the engineering Living Learning Community (LLC) had to leave campus in order to maintain social distancing. So that students didn't miss out on the living on campus experiences, I hosted digital social and academic digital check-ins with my students using Zoom. Students participated virtually, in pre-scheduled LLC social gatherings like guest speaker event nights, the annual banquet, and other fun team building events. I made several funny videos with my family, that aimed to boost student morale through the use of humor, and posted them on social media. My students created a video titled "We Will Survive." Such digital products added a personal touch and when shared through social media, helped boost the morale of students as well as colleagues during turbulent times."


We now move to some recommendations based off of themes from our analyses of the strategies that Krishna employed. All strategies that Krishna's reflections highlighted are student-centric and use technology intensively. Emerging technology is one of the hallmarks of his teaching, and Krishna uses an empathetic syllabus with flexible guidelines where intellectual curiosity is intact and social connections and personal accommodations are included. During the pandemic he changed his syllabus to make it more community focused. He included flexible guidelines so that intellectual curiosity, social connections, and personal accommodations would all remain intact. The student success model that Krishna has designed is supported by equally important elements inside and outside the classroom, including engagement, retention, access, community, active learning, peer support, assessment, and resources. During the pandemic, when students could not be together, he increased his community building efforts to keep students engaged and active learners. Krishna's approach to fostering community is not

new to engineering education and is supported by several researchers, who assert that online learning environments can be designed to reflect and leverage the social nature of learning.

However, the value added through this research is in understanding the extent to which strategies had to be modified in keeping with not only the challenge of pivoting online, but doing so while dealing with a catastrophic pandemic that was unequally affecting members of the global community.
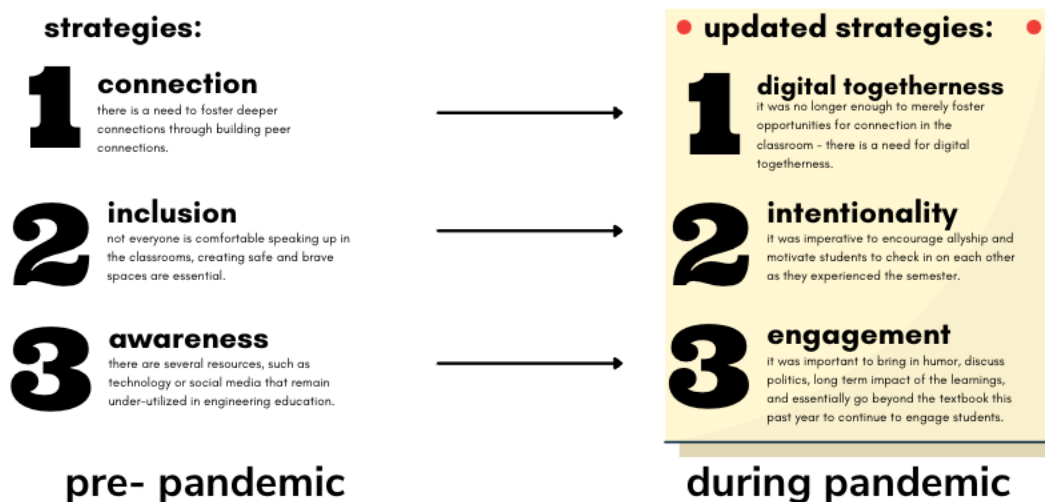
Krishna's reflections on the strategies he implemented during the pandemic show the revitalization of strategies that he had used previously. For example, it was no longer sufficient to merely foster opportunities for connections in the classroom, he realized that he would have to create opportunities to foster digital togetherness. Similarly, he understood that it was time that advocacy and intentionality made it to the engineering classrooms. It was no longer sufficient to just be inclusive for those in the classroom from marginalized communities, but also promote allyship and motivate students to check in on each other through the semester. Finally, he found it important to bring in humor, discuss politics it was important to bring in humor, discuss politics, long term impact of the learnings, and essentially go beyond the textbook this past year to continue to engage students.

"I am loving all the videos and photos you share with your network 'In these turbulent times, I will start my [sic] each day to relive the moments which connect us all' series. Makes me smile! I'm also amazed at how many photos and videos you have wow!"

Krishna's colleague on a social media post of his highlighting his teaching adventures

Feedback received from current students, former students, colleagues, and other members of the education community indicate that Krishna's efforts to support our students' and colleagues' learning and teaching during the pandemic was phenomenal.

A colleague noted "I am loving all the videos and photos you share with your 'In these turbulent times, I will start my [sic] each day to relive the moments which connect us all' series. Makes me smile! I'm also amazed at how many photos and videos you have wow!" In the end of semester student evaluations, a student mentioned "I'd say that the meeting that meant the most to me would probably have been the recent checking in one, as it's nice to reflect on what has been happening recently, as well as having a chance to talk with all the community members now that we're away from the campus". A former student commented on Linkedin "Krishna! Thanks for sharing all of your positivity through all of the stuff that is going in the

world. You are the most memorable/best professor I had throughout my educational career, and i wasn't [sic] even in your department! Keep it up!"
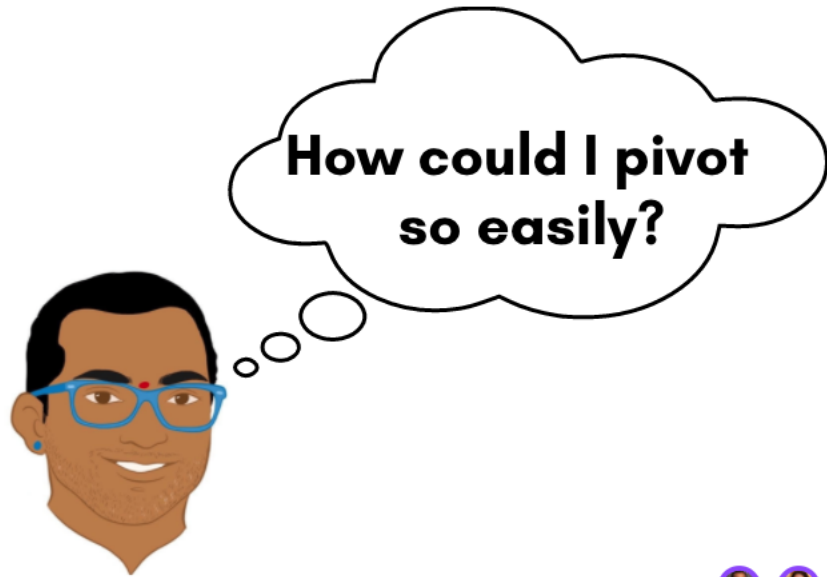
Analyzing Krishna's reflections led to uncovering several strategies that he'd found useful over time. These strategies also provide a glimpse into an educator's growth over the past few months as he rushed to pivot online but continue to create engaging learning experiences. As important as the strategies themselves was the theme that emerged from Krishna's reflections which uncovered portions where he elaborated on *why* he thought he was successful at pivoting.
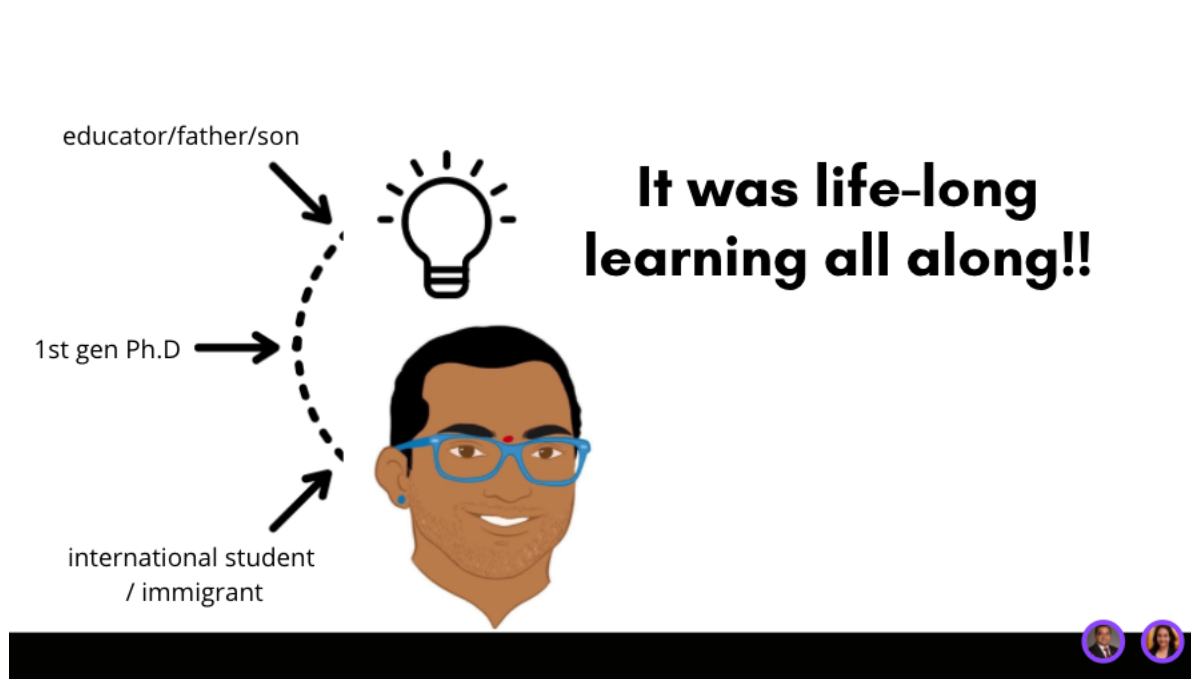
Krishna realized that his background as an international student, past challenges with visa which had rendered him away from his physical classroom for months and caused him to leverage digital tools had come in handy. He also realized that having lived 7000 miles away from family he had built skills over time to maintain asynchronous digital connections with global friends - a skill that he could finally leverage in his classrooms. In addition, these were skills he could help his colleagues build, over time.

The two important contribution of this research is in showing from an instructor's perspective how strategies may have evolved in teaching students through a pandemic, as well as illuminating the deep impact lifelong learning and identity have had on their growth as an educator through a pandemic.

TO:

The Academy

Important lessons for academia and fellow academics.

So what can academia learn from this work? And why is this important conversation we need to have in our departments and as we discuss D&I in the engineering classrooms and beyond?
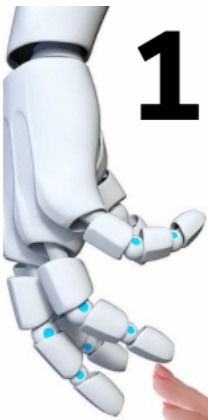

1. **Provide opportunities to educators/faculty for innovation and digital growth and encourage updation of social media platforms for ease of connection.**

As the world grows increasingly global, digital presence is one that is difficult to escape. Proactively, universities and educators should better their digital presence - making their research, teaching, and service inclusive and engaging both in person and in the virtual social networks.

2. Learn from and empower, promote the works of, include, and care for international faculty, faculty of color, women in the departments.
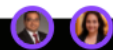
There should never be a need to justify for improved inclusion for diverse employees. Academia must raise the bar higher and aim to empower, promote the works of, and highlight those from marginalized communities. Including highlighting their research as part of spotlights that some universities implemented through the pandemic (Bhaduri, et. al. 2021).

3. Help faculty members do their jobs by investing in systems, resources and processes that take care of their well-being proactively.
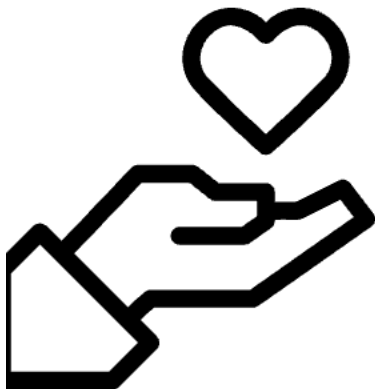
Finally, universities must help faculty members do their jobs by investing in systems, resources and processes that take care of their well-being proactively. This includes, but is not restricted to concerns such as those related to immigration or work-visa status, and simultaneously also educating co-workers on challenges faced by international employees and how to be most helpful and supportive through critical phases.

These reflections offer insight not only into personal growth strategies for educators, but also shed light onto the troubles and triumphs that international and immigrant teaching professionals in the higher education landscape may face.

 It is hoped that the presentation is useful for administrators as they think about supporting atypical cases to strengthen their infrastructure, since afterall, innovation happens most among those pushing boundaries whilst facing challenges.

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