In this episode, we are pleased to speak with Assoc Prof Kow Wei Chieh, recipient of the 2021 Outstanding Educator Award (OEA).

This episode is chaired by Assoc Prof Aaron Danner, Deputy Director of the Centre for Development of Teaching and Learning (CDTL).
0 Intro Music & Voiceover

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1 Welcome/ Intro (00:25):

Aaron Danner (AD): “Hello, everyone. I'm Aaron, Deputy Director of CDTL. In this episode, we're so pleased to have Associate Professor Alfred Kow, recipient of the 2021 Outstanding Educator Award share more about his journey to being an educator, as well as his perspectives on teaching and learning.”

2 Question #1

AD: “Hello, Alfred, and thank you very much for joining us today. Could you tell us more about the beliefs, principles, and philosophies that guide your teaching?”

(00:50)

Alfred Kow (AK): “Thanks, Aaron, for the kind introduction and like to thank [CDTL] for the opportunity to share some of my beliefs in teaching.

Personally, because I'm in the healthcare sector, I believe that medical education should be made widely available to all healthcare professionals in the highest quality so that we can produce very good doctors and nurses that will be able to take care of our patients.

Some of the key principles that I feel might be important to incorporate in medical education would include firstly, as an educator myself, I want to make sure that I'm able to trigger curiosity in my students to learn about
medicine, something is wrong if they're not curious about what they want to learn about. So I'll tell my students, for example, if you see something in a ward, in a clinic, everything should be interesting and curious to you, so you want to find out why and how it works.

Second thing, is really to also make the content simple and easy to understand, because you know, people think about medicine [as] being very complicated, and therefore our job as educators is really to make it simple, so that they can start learning from the basics and foundation, and build it from there. The third part is really also then, as the role of the educator, to incorporate and help them to knit all the information together from knowledge and skills, and more importantly in medicine, the attitudes and professionalism as well.

Lastly, is actually to allow them to practice in a safe environment before they hit the real clinical setting. And also, of course, in my personal interest to inject an element of using technology in making it exciting and interesting for them to learn. Those will be my key principles, I guess, in medical education.”

3 Question #2
AD: “I know that you've done a lot of work in technology and education. So maybe you could share some of those strategies with us that you use to engage students.”

(02:39)
AK: “I think we can't run away from using technology at this stage now, because our students grew up in the internet generation. And more importantly, the technology is developing so quickly, together with the Fourth Industrial Revolution, you know, AI and machine learning is going to hit the healthcare sector already there, and I think our future graduates should be well-equipped to deal with that.”
So how we have done that, especially me, being in the leadership position as the chairperson of the Medical Education and Technology and Enterprise Committee in the School, we aim to do it at all levels. In other words, ground-up encouragement of people to think about using technology in education.

Also, systematically within the School, we are looking at the gaps that's presently found within [the] curriculum. We do an annual review, we get feedback from our students, and with this gap to think about if technology can be used to sort of either overcome or enhance the learning, and fill in the gaps. More importantly, we will then have our local teams, who will think about what are the exciting and interesting technology that can be used to be incorporated into it. And together, of course, we will also build in a feedback system so that we know that it works, and then we continue to enhance the process further."

4  **Question #3**

AD: “So what are some of the things that technology can do in medicine specifically, that say you wouldn't be able to do with traditional curriculum?”

(04:09)

AK: “I think the traditional curriculum, we usually divide them into two parts: the preclinical part, which is usually the foundation building, and so on and so forth, together with the later part, which is the clinical exposure, so I will deal with them in two separate parts.

The preclinical part, for example, some of the core content may be rather heavy. But with our students being able to [gain] access to this information readily [from the] internet and no, they don't read textbooks anymore, they can easily access all this information online. It's important to then use technology to enhance their ability to understand this, for example, anatomy. Now, if you ask them to just read on textbook or look at the
pictures, they might not be able to have a full appreciation compared to if you convert them into an entirely interactive virtual environment, where they can interact with the hologram, and so on and so forth.

Of course, it doesn't take them away from the learning experience, for example, in[sic] during dissection of cadavers, they can learn the anatomy in real life as well. Whereas in the clinical setting, we can also use technology to overcome some of the challenges that we're currently facing with a big number of students that are roaming around the hospitals, sometimes to get variable experience in different places, it depends on who they encounter. And so [for] some of the key principles and concepts, we can bring them back to the university and use technology to provide them with the universal exposure. And that allows everybody to have sort of level playing field, and yet everybody will then build on this experience when they encounter different cases and different scenarios in different hospitals.”

AD: “I suppose the use of technology was also really useful during the COVID-19 pandemic.”

(05:48)

AK: “In that, I think you hit the [nail] right there on the point[sic], because of the ability for us to have some foresight in developing technology in education, it came [in] quite handy during the COVID-19 [pandemic].

Because our students, especially when COVID-19 first came in the early part of 2020, our students were not allowed to go into certain high-risk areas like the operating theatre [or] the endoscopy room. And coincidentally, we [had] some virtual reality projects that [were] able to allow them to immerse into that environment. While it can’t replace the full experience that they will eventually get, but at least at that point in time, they were able to still continue to learn using the virtual environment and be able to understand how [the] operating theater works, what were the patient safety aspects that [need] to be emphasised during education, and
so on. I think they not only [found] this interesting, but I think this experience is long lasting, because when we conducted our study later on, when they are now I think they [were the] graduating batch, they were [in their third year] at that time, they were able to still recall what they have learned and apply many of [these] principles when they were in the internship programme.”

AD: “So could I say that the use of this kind of technology, that is, use of virtual reality for example in medicine, is that relatively new?”

(07:10)

AK: “[It is] new and yet, not so new. There have been some projects around different parts of the world, but to use it in [a] large scale in a systematic manner, not many [health systems and medical schools] actually have that. The unique thing [about] NUHS and NUS Medicine is that we are, at this point in time, linked at the hips as two organisations under one body, such that we are able to really streamline all the available technologies to be used both in the hospital setting and also for the medical school. And with a systematic approach to this, we're able to then develop a lot more projects that is useful for medical education.

We also have a standard process where we review annually what are the areas that potentially can be used to introduce technology to enhance [student] learning. So, this sort of encourages many people—our faculty and our educator community in the medical school—to think outside the box to use technology.

And one additional point is actually, I mentioned recently that the “fortunate event”, I shouldn't be saying this, but the COVID-19 [pandemic] sort of pushes people to think outside the box. [This is] because the conventional way of teaching, you know, had to be quickly modified to be able to meet the challenge, when face-to-face [classes] were not able to be done during the COVID-19 [pandemic]. And our faculty members who
were previously resistant to adopting technology; now, many of them are early adopters, or [are] even very keen to consider.

So, in this sense, I think we are seeing sort of like a movement that people are now actively thinking about doing that. And it's an exciting thing to do, actually.”

AD: “Is it difficult to measure efficacy, for example, to measure how well the technology is being received by the learners? Or, is there a way to judge whether the desired learning outcomes have been achieved?”

(09:04)
It is challenging at this point in time, because [there are] various reasons why it is so.

Firstly, [it] is because you cannot be 100% sure that is because of the technology that actually makes the difference. But I don't think the technology itself can do the job, but it's actually the content that is more important. So most importantly, is actually [that] the people who created the content must be able to contextualise it in a correct manner.

And so I think it's important not to use the technology for the sake of the technology, but to be able to identify where are the gaps, how are you going to use this gap to overcome the challenges that you have at this point in time, and certainly infuse what we call the scholarly activity, that is, to build insights so that we are able to understand truly from the learner perspective [that] they have learned something and also at the same time, have a feedback process so that we can improve on it, [from one] version to another.”
Question #4

AD: “Alfred, that’s very exciting and really interesting. I'm glad, at least personally, that we're moving towards having very good doctors and nurses down the road.

So I was going to ask you, what are your plans for the future? You've already done a lot in terms of using technology and education with the virtual environments. How do you see the future?”

AK: “The future of the [sic] medical education, I presume that’s what you are asking?

AD: “Yeah, or the use of technology. What can we look forward to down the road when the technology improves even beyond where it is now?”

(10:32)

AK: “Because we are now seeing a lot of AI and machine learning that is starting to come out in in the healthcare sector, many of these will be aiming to enhance the efficiency of how doctors and nurses do their jobs, improve [the] diagnostic process, improve processes in how treatments are being instituted, and so on and so forth.

I think that is where the excitement is, and there ar a lot of concerns that this may take away the role, the job, of the doctors and nurses, but I don't think so. I think in fact, it will free us up to be able to really now focus on treating the patient.

The processes can be made more efficient and more accurate. For example, now we have AI that can do retinal scans and make a better diagnosis than a doctor or even a radiologist, [who may] potentially need to figure out what their roles will be in the future. But I think what we want to focus on is really [to] enhance on the positive ability of the technology. And I also mentioned recently that I think the AI needs us to teach them. So, we are the one that decides the outcome of that.
But in this process of leading to the future of medical education and healthcare, I think we need to equip our young ones that are currently in the learning phase with all these knowledge and skills. [This is] so that when they hit the workforce, they're able to run and more importantly, get them excited because they may be the next generation of leaders who will then make the changes to continue to adopt these in the future.”

AD: “Right. So Alfred, what are your near-term plans, then?”

(12:09)

AK: “My near-term plan will really be [to] still continue to encourage people in the School of Medicine to think about using technology in education. I think in the next three to five years, we will see mixed reality technology coming quite prominently into the healthcare education scene. It is something that's very new. People are more aware of what virtual reality is, but I think mixed reality technology is going to become, I think, the main stage[sic] in at least the next three to five years; of course, with the ability of it incorporating AI and machine learning.

So, in the School of Medicine, we do have now some projects that we are going to actively start engaging the partners to develop, for example, procedural skills training using mixed reality tools, communication skills, or even making our anatomy and other pathology learning and so on and so forth to be even more interactive using this technology. And hopefully, what we want to do is really to make NUS Medicine one of the key opinion leaders or early adopters in this area, and we are quite optimistic we'll be able to do that.”
AD: “Hopefully, as the technology improves, then you'll be able to do more with it too.”

(13:29)
AK: “Definitely. In fact, we have close working relationships with the industry partners and our feedback is often taken quite seriously, so they will then modify and upgrade the software as well as the hardware to meet the needs of healthcare education as well as the healthcare setting.”

Closing Remarks (13:46)
AD: “Alfred, thank you very much. I really appreciate your time today and for sharing your teaching and learning journey with us.”

AK: “Thank you so much, Aaron.”

7 Outro Voiceover

“Thank you for tuning in to the CDTL podcast.”

Outro Music