ASCILITE Wavelength Episode 4 Transcript

Opening

Host: Welcome to this edition of the ASCILITE Wavelength Podcast. I am your guest host, Sandra Barker. In this episode, Michael Cowling talks with Australian Research Council Laureate Fellow Michael Milford about all things learning and science communication. Amanda White concludes her series on Academic Integrity, examining the issues and alternatives in online exams. Lastly, our students tell us what motivated them to pursue studies in higher education in "The Student Voice".

Segment 1: Michael Cowling interviews Michael Milford

Host: First up, Michael Cowling talks with Michael Milford from QUT. Professor Milford is an Australian Research Council Laureate Fellow, which is a high honour awarded to researchers who demonstrate world-class research and strong links with community, industry and research end users. We now go over to the two Michaels.

Michael Cowling: Welcome ladies and gentlemen to this segment of Wavelength, where we're going to do an interview with an expert in the area of technology and technology-enhanced learning, and today, we have recent ARC Laureate Fellow Professor Michael Milford, famous not only for his work in artificial intelligence and robotics at QUT, but also for being a passionate stem communicator in the wider public scholarship space.

So, welcome, Mike.

Michael Milford: Thanks for having me on. Great to see you, Michael.

Cowling: Great to speak to you, too. So, I think the first thing is first and foremost. As I mentioned in the introduction you are a fairly recently minted ARC Laureate Fellow, and so I think, as is often the case, when you win a big award or a big grant, everybody always asks starts by asking you, "How did you do it?" And so, I'm going to get that out of the way by saying to you first and foremost, "How did you do it?"

Milford: I did it by being very fortunate to be well-supported by my mentors, my peers, my research groups over the last almost two decades now and being able to pursue a continuous stream of research into the topic area of my eventual Laureate Fellowship, which is biologically inspired navigation systems for robots and everything in between.

I've been very fortunate to be able to do this research for almost 20 years, and because of that, we've made great advances in our understanding of how to create really high-capability technology for robots and autonomous vehicles and other machines. And what we're going to do in this Laureate Fellowship, with quite a large research team and bunch of collaborators from all around the world from many disciplines, is try and create a ubiquitous positioning system that will serve as a viable alternative to GPS going into the future.

Cowling: Awesome, awesome. So yeah, that's great. So, I was going to ask you what your favourite disciplinary project has been in robotics or technology over those last 20 years. I suspect that the answer is going to be the one that you're doing now as an ARC Laureate Fellow, but maybe not. So, I'll ask the question, what's been your favourite project you've done?

Milford: In in the research field, I think it was the first really substantial project that I did, which was my PhD, which started back in 2003, and it had the same broad topic, which was biologically inspired navigation for robots. So, what we are trying to do is model how the human brain and how animal brains navigate the world and try and replicate that on a robot. But back then, when we were doing it, although there had been some research on it previously, so much of it was brand new, completely

undiscovered territory. And so, the things that we had to grapple with—and some of this is the benefits are sort of looking back with fond nostalgia. Some of it was very tough at the time and frustrating, but doing that sort of freeform, completely unfettered research where we really didn't know what was going to happen was incredibly challenging, but also amazingly fulfilling and exciting. And so, I think overall that was probably my favorite project.

Cowling: Wow, I'm not entirely sure any professor I've ever spoken to would say I like my PhD the best.

Milford: You have to give it enough time to look at it, I think is the key.

Cowling: You've got to have enough perspective on. I like that. So that's awesome. Thank you.

But as well as that, and in the context that you and I met each other and, I think, the context for ASCILITE as well, is that you're also a massive stem communicator or science communicator or scicomm, if you want to use the hashtag. So, talk to us a little bit about your science communication, and in particular, I'm interested in why. I mean, you're an ARC Laureate Fellow, you don't have to do any science communication, and you would still be wildly successful, wildly successful as a professor. So, why do you do scicomm?

Milford: That's a great question. I guess I should note I suspect I partially got the ARC Laureate Fellow, and I don't know how exactly they assessed it, because of my sort of lifelong commitment to scicomm. Increasingly, researchers have a responsibility to really do outreach and engagement around their field. Because without the communication, without the public and industry and government understanding what you do, why you do it, and why it's important, it's sort of a moot point, and so I think that's a big part of what my research career is about nowadays.

As to how I got into it. Although nowadays it's very planned and structured, it was almost by accident. In high school, I discovered that I found it incredibly, enjoying and fulfilling to try and explain very complex concepts to classmates. So, that could have been in maths. It could have been physics, any other sort of STEM sciences, and so I discovered this love of trying to take relatively complex topics and distill them down into very digestible bits. What happened is that translated into a tutoring job when I was at university. Once again, very *ad hoc* manner. And during one exam period early in my university days, I finished exams a week earlier than all my friends, and so I had nothing to do. And so, I wrote a textbook that summarized all of these snippets on how to explain maths concepts I had been developing over many years at the time. I think I was 18 at the time when I wrote this. Without thinking about feasibility of what would happen…that was one of the beauties of doing things back then. I wasn't really planning anything, I got it printed as a textbook. I got 40 copies printed. I put them in a local Dymocks bookstore at Christmas and got a little bit of publicity, and a math textbook sold out at Christmas time. And then it continued to sell out with every new print run. We got a hundred 203 hundred 500,000 books. It kept selling out, and since then, I've never really looked back. I've done a lot of projects like that since then, we've had about 20 books, workshops, all sorts of edutainment type stuff, but that was really the origins of my lifelong interest in doing all of that outreach and engagement and education.

Cowling: Just that, just a love of learning and a love of teaching in a way as well in sharing that knowledge. That's awesome. I will say that I have the same love of teaching and learning, and I always thought it was something you had to have as a professor. And it was only as I got a little bit older that I realized that not everybody necessarily has that love of learning. Sometimes people just like to explore and discover things, and I think it's awesome that you're interested in both exploring in discovering, you described that in your doctorate as well as communicating. That's great. So, tell

us a little bit about what you're doing in that space now in the STEM communication space, 'cause I know that another relatively new venture for you is pushing out a little bit more in that space as well.

Milford: Yeah, so I have a startup called Math Thrills, which has funding from a variety of sources. We do Kickstarter projects. It's also got some funding from my university's commercialization arm as well. And we've gone through a few phases of that initiative. So initially we tried to embed education in high school, primarily education in maths, primarily into entertainment. So, we did sort of action-packed workshops where we created…it wasn't a bomb, but it looked like a bomb…sort of mock bombs, which involve code cracking exercises. They were 3D printed. We did a lot of educational workshops around movies. So, we did some stuff at World Science Festival, and then we created a whole stream of books including a maths novel thriller. And so, I got a professional writer and a co-writer, and we wrote two versions of a young adult novel that was stealthily embedded with maths concepts all throughout. That one is called *Code Bravo*. It's still one of my proudest achievements, 'cause it was really hard to do. And more recently because it's very tough—we found it very tough to create really edgy content for teenagers that is still acceptable in a widespread didactic setting in schools. It's a very tough boundary to walk. Much easier to do that at K-Primary level, because what constitutes entertainment there is much simpler. There's no violence. There's no challenging concepts. It's just fun little stories. And so, we've done a lot more of our recent work in the sort of primary school area, because it's less challenging in many ways and you have a bigger chance to influence people earlier are in their educational journey and so that's what we've been focusing on primarily.

Cowling: Awesome, awesome. Yes, I've had the same sort of epiphany when it comes to education. People often say to me, "Well, you're a professor. Why not just higher education? Why K to 12 ? And as you said, why K to six primary?" And my argument has always been well education is education. It doesn't really matter. And I think your argument that we get to them early is what I've often made the argument for as well, but I think siloing things into primary education and secondary education and tertiary education, I'm not entirely sure that makes sense. And I love the fact that the books that you write, for example, are intended for younger kids, because I think it's never too early to teach them about robots and artificial intelligence and what you do.

So, tell me a little bit about how you then bring this back, because one of one of your other jobs, apparently your many hats that you wear, is as acting director of the Robotics Center at QUT. And so, tell me a little bit about if you bring that kind of stuff back to your job as the director; is there an opportunity for you to try and get some of those other academics out of their ivory tower? And if not, if you don't want to betray any of the secrets at QUT, just in general talk to me about getting academics out of their ivory tower and whether you think that's worth doing for people apart from you and me?

Milford: Yeah, look, it's, I think for the vast majority of researchers, it's vital that they get out and about and engage with sort of as wide a cross section of society as possible, because you learn so much in interacting with all these different groups. And for me, I enjoy it, but it's also been a phenomenally eye-opening experience interacting with pretty much every sector of society in my job. And the overlaps with education and outreach and your own research, there's many synergies like being able to communicate the key essence of what your research is about will benefit your research, the research papers you publish, the grants that you submit. And so, it's a very synergistic sort of thing to do, and I think in defense of academics nowadays, I think a lot of them know this already and, to some extent, participate in a lot of these outreach and engagement activities. I know our group is quite public facing, like all of our academics regularly do workshops or talks outward

facing, and so that's something that we embrace. And it's particularly important in transformative tech fields like robotics or AI, for example, where there's this hunger to understand it, there's this need to understand it. And the more we can bring everyone up to sort of having that intuitive understanding of what AI and robotics is, so they understand it as well as they understand how a car works. That's vitally important, because then you have an informed society, and an informed society will generally make relatively good decisions and that's basically the essence of it.

Cowling: I love that. I love that idea of an informed society that ultimately if you get to teach the general public about robotics and AI and the stuff that you do, then then society as a whole knows more about the field. And that's good for us as academics, and it becomes a very circular process, so that's awesome. So, I've got one more question to ask you, and then I'll let you off the hook. Imagine you could wave a magic wand, and you could change one thing about technology and education tomorrow. And so, you noted earlier on this progressive approach of your career over 20 odd years. But let's imagine an alternate dimension or a portal or something like that, or the opportunity to wave a magic wand, what would you change about technology or education or technology in education to make things better?

Milford: That's an easy one. So, technology is often put forward as a sort of solve everything magic ingredient, right? You just add it to whatever your problem is, and it solves everything. And, of course, that is wrong. I think the extra challenge that technology faces in education, though, is that education is this incredibly challenging minefield of different theories to how we should teach, how we should learn, and when you add technology into the picture, the potential value of technology gets massively muddied and confounded by all of these ongoing ideological arguments that are going on. There's your light. And so, it's not just the technology has to be reasonably fit for purpose, but it gets lumped into these other high bars of having to meet whichever particular educational ideology the particular party is pursuing. And that just makes it pretty much intractable. And so, I would love if there was a magical scenario where technology was still held to a high standard. It had to be sustainable. It had to be achieving the actual outcomes that we want, but it wasn't also being subject to this sort of ongoing scrutiny about different learning theories which apply just as much to non-technological ways of learning as they do to technology.

Cowling: That's it. That's interesting, and I often with my class talk about that. Did we have 10 years of debate before somebody decided to wheel the TV into the classroom and play something on the television, right? Introduce early technology, and we didn't. And yet, we seem to have that level of debate these days with technology and get very caught up in all of that kind of stuff. So, I think that's a that's a great wish. I will try my best to ask my fairy godmother for you because I'll pay that one entirely. So OK, so that's it. Thank you so much Michael. It's been a quickfire interview, but I think hopefully, we've gotten some great insight into technology and how you think technology fits into education, so thank you so much for being on the ASCILITE Wavelength.

Milford: Thanks Michael. It is great to chat.

Cowling: Great to you, too.

Mid-Program Break
Announcer: This podcast is brought to you by ASCILITE and tell as the Technology Enhanced Learning Accreditation Standards. TELAS is a rigorously derived framework that recognizes quality online learning through a certification process. The standards for free. Find out how to get your course certified at www.TELAS.edu.au Now back to our podcast.

Segment 2: Interview with Gerhard Hambush, Senior Lecturer, Finance at UTS

Host: Welcome back. Dr Amanda White now concludes her three-part series highlighting issues and challenges in academic integrity. In this segment, Amanda chats with Gerhard Hambush, Senior Lecturer in Finance at UTS.

Amanda White: I'm here with Dr Gerhard Hambush from UTS, and he is a senior lecturer in the Finance discipline. I met Gerhard because we talk a lot about academic integrity, and he's done some fantastic work in trying to figure out how to check for integrity in written responses in learning management system quizzes, where he has a whole workflow to be able to run these types of quiz responses through Turnitin.

Gerhard, welcome. If you could have anything to support academic integrity with your students and use of technology, what would it be?

Gerhard Hambush: Hi Amanda, thank you so much for having me. I'm excited to speak about something as important as academic integrity, in particular in COVID times, where many people sit at home and do their exams or quizzes or other assessments. So, thank you. I think academic integrity starts all up with, you know, information. So, I think it is very important that, when we talk about technology in a minute, students do not only get then hopefully be identified if they do wrong through means of technology. But I mean, students have to first understand what they ought to do, or what they what they shall not do in order to properly respond and act during these assessments. For example, when they take them from home or from any other locations and for example, a university room. And hence, I think it's important that we educate undergraduates about things like plagiarism, any third-party help that's used by students.

And students also need to understand what are the violations that that they could be actually undertaking, because this could ultimately destroy an academic career. And, at least for my personal experience, when I studied in the United States at the postgraduate level, it was very clear that if anybody would cheat in their program they'd be kicked out of the university and they'd lose their fees, their school fees that we paid for the program and stuff. So, we took sometimes exams in empty rooms, where the professor went out, and 25 people set in an MBA class and took assessment. So, that was a very important experience for me, but I was well informed what I would be facing if I'd be perhaps courageous enough to look at my neighbour's paper. So, that's I think the first thing, you know, information, and I know that you help. So, for example, as a university expert such as yourself, Amanda, here at UTS, you've provided me with help by, for example, we record a little video clip that I can show to my students before we start engaging in this semester and even during so that students have a chance, maybe from another face–the face that's not the subject matter expert—to one more time be educated, but also being reminded of what can be happening if they were to be smarter than fifth graders, so to speak. So that's, I think, the first point I want to make.

White: It is interesting, because quite often we talk about academic integrity at the beginning of the semester, but it sort of falls out of students minds. So, having key points where we might be able to remind them, even when they're perhaps submitting an assignment, "Have you remembered these rules?" That could be really interesting. And what else did you have in mind of ways that you think technology could help us support students in academic integrity.

Hambush: So, what I was thinking is that, of course, this information piece also comes back into technology, just the way you just described it. So, you know, frequent reminders, for example, when

a quiz or an assessment starts with a with a small reminder of a line of text or two lines of text that will, perhaps, refresh a stressed mind when they take an assessment.

But let's talk a bit about that before piece, when we now assess technology and the way we can use them for assessments at university. So, I think it's important to build smart assessments, and an organization like UTS provides a wealth of resources. I trust other universities and educational organizations do the same. But to build assessments that are somewhat smart in order not to be gamed or plagiarized by students that are out there to win the game without really studying… And so, for example, we have different means of marking students, but yes, multiple choice is still a workhorse, at least to some extent in some assessments, in larger classes. And the use of test banks is known to everybody, but to build clever test banks, or let's say test banks that then facilitate the academic integrity over all, that probably needs to be learned from an educator side. So, you know, you can have qualitative questions with funky, fancy, interesting names, but if the name is like mine, Gerhart Hambush, and there is one out of 100 question in the bank, and students have over time try to extract the bank a means of taking photos. They just have to search for Gerhart Hambush, so why not calling everybody in every case, David Smith or Lisa Brown? That make it (I'm just giving one simple example) much harder for those that try to quickly run through harvested banks to find to find the question that they maybe on the fly wanna cheat on. It certainly would be great if organisations, like universities, provide help on cloning of assessment pieces. I know that cloning is important and with quantitative questions, but it's much easier because you can change numbers, probably change the set up slightly. And that makes it very hard then to just take a screenshot of another student and try to reverse engineer the solution. But when it comes to qualitative items, cloning can be well defined. I would embrace if organizations can do a bit more with us the educators around these are learning goals maybe.

White: Oh, that's really interesting. And did you have anything else?

Hambush: So yeah, I have a couple more things, and, of course, I'm inviting you to pick and choose what you like here. But ideally the management system permits, for example, not only randomizing questions on one list, but also randomizing of buckets that represent a list. So, I'd love to have more randomization choices when it comes to setting up the use of banks, for example, and to be honest with you, I'd love to further improve on assessments. And this is probably a very naive ask. I'd love something like you know, Canvas at UTS offers the chance to check URLs with one push of a button I can check if any of the hyperlinks are broken. I'd love just, you know, as an additional diligence check of my now super-developed bank or test that I have one button that just quickly runs me through, not to have made a mistake in spelling David Smith or Lisa Brown, when I was trying to set this up in a clever fashion. Now, so that's just side note.

I guess, during an assessment, I'd love to see that information is repeated, "Do not cheat; just be reminded." I've seen people coming into to assessments and harvesting them. So, they come in and after four minutes, they're done. Obviously, those are the straw people that come in and then extract an exam and then share it. I'd love some additional technology—simply means, like say you know, if multiple choice questions set up for 90 seconds, while allowing them within two seconds to run through this and make screenshots. Why not having a lock in there—simply 30 seconds or 40 seconds—just to freeze harvesters from working very efficiently.

And of course, I'd love to see flags all over the place. We need a dashboard, you know, as educators so we could see you know someone takes a quiz in a record time…rocket speed record time. You know why don't I get flags like here's a person that took a 30-minute quiz in three minutes and got 89%. But wow, that's a good student, isn't it? But I'd love to see some dashboard information. And

probably the main piece what I'd love to see is after the assessment, for example, multiple choice question-change detection algorithms. And if those need to work with banks across several hundred students, that becomes quite a complex task to assess probabilities of people having just exchanged answer chains. The quick test takers already said that would be great if my dashboard pings me. The timeline analysis—who started early, who started late, and who comes up with the same questions, maybe along with the chain detection perhaps? And automation check if answers to a question make sense. So, the example is if I have two groups, I quiz them with open answer essay questions, and those are brother and sister questions. Of course, I'm using maybe David Smith in one question and Lisa Brown in the other question. But if someone in the first group in the David Smith Group answered with Lisa Brown, I need to find that. But it would be nice if you know some easy algorithm tells me, "Hey, here's someone that has something off from this test."

White: There's often an expectation that academics or educators who are marking assessments become human lie detectors, and we're looking for all those differences. And I think, one of the things that we've, you and I, have talked a lot about is why isn't there Turnitin for learning management system quizzes where we have written questions. And I know that you do this extensive process where you extract into a CSV and then you load that CSV into Stata and then you create reports and then you compare them. And it's a significant volume of work. And one of the things that I think that as an industry, we're also stuck in. We're not really stuck, but we're constrained by, is the financial situation of universities. Quite often there are test-taking platforms or tools that we could use, but everything in ed tech costs money. And it's always, well OK, how do we prioritize these? Institutions all across Australia are feeling the pinch in terms of pennies, and so, like me, like you, you've turned to this DIY process to check for plagiarism within learning management system quizzes. And a lot of these other things you've talked about, require actual time and then money investment to make them happen.

So, thank you for all of these wonderful ideas that are going to be shared with our ASCILITE community.

Hambush: Thank you very much, Amanda, for having me, and I look forward to discussing more about academic integrity in the future. Thank you.

Segment 3: The Student Voice: Motivations to Pursue Higher Education
Sound effect: Phone ringing

Announcer: We spoke with students across Australasia about contemporary issues in tertiary education. This is what they said. This is "The Student Voice".

Welcome to this month's "The Student Voice." We know that learner motivation is critical in student engagement. We were curious what is motivating today's students to participate in tertiary education and what it is they feel they are getting out of the experience. We spoke to…

Gayani: Hi I'm Gayani, a doctoral student originally from Sri Lanka.

Zack: Zack, studying a Bachelor of Science Education in my third year with a Chemistry major.

Juliana: I'm Juliana, a matured-aged post-grad student in Education.

Announcer: So, what motivated you to participate in tertiary education?

Zack: Yeah, I think when I was in high school. It was almost never a thought to not go into high education, because I was always really into science or some kind of technology. My initial entering career was to be a geneticist, and so, any real pathway that I saw led me down a career that I wanted really required education. So, the one that I've ended up with—teaching at the current moment, for the very least, you require a bachelor's degree at the very least and maybe a master's to add on. So, it was almost, it sounds weird to say it wasn't an option, but just for the way, I wanted to live my life. It was never really a question.

Juliana: I can't say that I really knew what I wanted to do, but I come from a country that going to university is just a flow. So, if you finish your high school year 12, you just have to go to university. So, it's not something that you already know what you're doing, but at the end of that's where you go to.

I always loved studying. And my first graduation wasn't really what I wanted, I figured out that I was doing BDHB and on my third year, I just decided that's not exactly what I want. So, I did my second graduation, and I just felt like the hunger for studying more and knowing more about some specific subjects that's how I went to post grad studies here.

Gayani: Thinking back education, I think it was mostly my upbringing. I've grown up in a family full of academics and professionals, so that is what I always saw growing up. It was kind of like the standard in the family. And I had no other way out but having said that, I'm not saying that in a negative sense, that was very encouraging, and as the years went by, that is why that is what I wanted to do, as well. My mom, she's an academic lecturer. So, that's what I saw day in and out, growing up, and I think that's why I kind of so to education as my path, why I want to be that and, you know, I found my place in the family wanting to be in higher education going into higher education. There was no other way out as well.

Announcer: What is the value that you are deriving from your tertiary education experience?

Zack: I think pursuing further education, aside from getting me a degree that will enable me to become a teacher, is a really good avenue that you do get the opportunity to taste a few different things that you are interested in. You know, so, for example, I did start with a bio major, then I went to chemistry. It's kind of just this being in higher education, there's always opportunity to try different things, whether it be academic, choosing a major, or, like, different job opportunities. So, I've had maybe 5 or 6 positions around the uni or varying job descriptions and just what you can really gain from that has been like, a really positive experience for me, in terms of teamwork, leadership, and management has been a huge one. It was kind of skill I had no real clue about my level of, and I got into a management position, and I figured it out very quick. How well, my skills. So, I think for the education, to me, kind of is a challenge that you can rise up to, if you want to, or you can kind of just peter on, get your degree, if you like.

If you'd like it. But, it's kind of an area that lets me challenge myself if I want to if I want more challenge I can if I want to back at. You know, reduce the difficulty I can if I like, um, at this point in my life, I think it's definitely. Where I need to be because it's given me the space I need to grow with the support services around me, whether it be my fellow students, or, you know, the academics. It's kind of given me the routine if this is what I want to be, this is how I need to do it.

Gayani: So, pursuing further education and just relating that to what values I would get Dane and out. Relationships around me were evolving around higher education. People engaging in professions and learning, getting involved in higher education. So, first thing I would say, growing up, it gave me a place within my inner circle, like family, and now that I am doing my PhD, I would say, is

that contentment I get waking up every day curious. What can I know more about the research that I'm doing that keeps me engaged? And it gives me an opportunity to open my mind and be free, I guess cause that's the lifestyle I saw and I find value. In pursuing high education and engaging in higher education and looking for a career out of higher education, as well, I would say, especially with the family, seeing everyone working in education industry. Like, I wanted to be there. Now, it's just passion and there's a lot of content coming through. But it sounds very cliche when I say this, but it is, at the same time, we are in a world that education qualifications, open up a lot of doors. I'm a very career-oriented person. If I don't have paper qualifications, I'm going to get stuck at one point because I value my career the most currently. That is one of my other avenues to look at. Like, I find value in engaging and investing time in higher education.

Juliana: I think there are more opportunities and more challenges, as well, to make you grow as I'm not only as a student, but as a person, as a professional. So, I think that really education is just like, little windows that open in your brain, and you're just, it's kind of, you want to open more and more windows so you just keep them going that way. It's just stretching a bit further. That's just way I feel about higher education.

Closing
Host: And that concludes another ASCILITE Wavelength Podcast.

Thanks to our segment producers Michael Cowling, Amanda White and David Porter and our guests Michael Milford and Gerhard Hambush and our students Gayani, Juliana and Zack.

Music for the podcast is produced and performed by Kevin MacLeod of Imcompetech.com. Thank you for listening to the ASCILITE Wavelength Podcast. Find out more at ASCILITE.org.

Epilogue
Host: Hi, I'm David Porter, one of the producers of the ASCILITE Wavelength Podcast. I wanted to take a moment to invite you to be part of the podcast. We've designed the ASCILITE Wavelength Podcast to be community contributed. We invite academics, professionals and affiliates passionate about learning and teaching in tertiary education to pitch and produce podcast segments. If you are interested, we invite you visit ASCILITE.org and check out the Connect section for further details and submission guidelines. And we at ASCILITE want to thank you for listening.