Prof. Martin Westwell   
Director of the Flinders Centre for Science Education in the 21st Century at Flinders University

Why Australia needs your Research Project

I’ve had a career in research going from chemistry research to biochemistry, doing things like drug discovery for Alzheimer’s disease and now the research that we do is about the neuroscience of learning, how your brain changes when you learn.

And for me that change is the thing that I’m most interested in, the thing that I think is incredibly important for the Research Project.

Whenever I have PhD students, I have new PhD students, the thing that I ask them isn’t what you want to do for your research, it’s who do want to be after you’ve done your research?

How do you want this research project that you’re going to do in your PhD, how do you want this Research Project to change you?

How do you want it to position you as a platform for the rest of your life? And that’s the question, of course, that I really want to ask you.

You might not have chosen your topic yet or your research question yet, you might have already nailed it down.

But now is the time when you can think about how you want it to change you. What it is about the Research Project, how you’re going to approach it because how you approach it is going to change the way that it shapes you.

You get to choose how you build this road that you’re going down with your Research Project.

The reason why I think it’s important to let your Research Project shape you and to approach your Research Project in a way that it’s going to change the way you think is because the demand of that of the world.

At Flinders we’ve got a large collaboration, one of three universities in the country, it’s got this big collaboration with Cisco, we’ve been talking to Cisco about how we need to think in the future to make the most of this. It’s been interesting that Cisco think that the ‘internet of everything’ was worth around $600 billion last year around the world. And in Australia what we’ve found when we’ve talked to Australian businesses, and said ‘what’s going to make a difference, what’s going to allow you to make the most of this change in the world?’

And they said, they found that 22% of the companies said that it was going to be ‘things’, it was going to be the technology that was going to make a difference. At 25% it was going to be the ‘processes’ that they put in place, how they use that technology, what processes they’ve got to exploit it. Well 39% of them said that it was going to be the people so we’re seeing big future thinkers talking about the way that we think in the future needs to be different.

And this is you – it’s not me. This demand on you change your thinking, this research skills thinking of course is about you and your futures and your future contribution to Australia.

I’ve got a little note up there to get me to say something about innovation and age. There’s lots of research about innovation, about new thinking and who does it. And there’s a great research paper that looks at people who have won Nobel prizes for their research. And the people that won the Nobel prizes for doing research were – you know – they added a little bit of new knowledge on top of existing knowledge and added a bit more and added a bit more and over as lifetime added a massive contribution. Those people were likely to have done the work that lead to the Nobel Prize in their 50s and 60s. But the people who won Nobel Prizes for great insights for innovations…people like Watson and Crick who discovered the structure of DNA, those people who won Nobel Prizes were most likely to have done the work that lead to that Nobel Prize in their 20s.

I’m past that, that’s not me anymore, that’s you. You know, the Research Project needs skills and how it shapes you I setting you up to be those people. It might not be Nobel Prizes, but it might be about your work and your life and the innovation within that.

And you know, Cisco got on and said ‘we used to talk about, in technology, how the things that were important were things like big data, having access to information, knowing lots of stuff was important. And so it used to be important, most important, to be a ‘rememberer’ to have all this information available to you and now what they’re saying is ‘well the world’s changed, and now it’s not enough just to have that that knowledge and that information, what you’ve got to be able to do is make big judgements. What you’ve got to be able to do, what a business has gotta do, is make sure that effective decisions can be made at the point at which they are needed.

Pushing that decision-making, that judgement-making onto you. And so this shift in thinking is being demanded all over the world. And requires us to be what I’ve called ‘resilient questioners’ not just knowers but people who can ask questions and that can take a knock back and then ask another question. I still don’t understand that, come on, find another way and dive in again and so the Research Project has that, has got that ability to develop as resilient questioners. But it depends on whether you sit back and just do the Research Project cos you’ve got to, or throw yourself into it and make the Research Project work for you. Make the Research Project shape who you are.

My thinking has been really shifted by information like this, this is some information about graduates from the Massachusetts Institute of Technology in Engineering. And this is some research and they said “ok so you engineers out there who went to MIT, where did you get your skills?’ So the first bank on the left hand side, that’s things like the physics of engineering, some things about thermo-dynamics, some things about structures. You know the stuff of engineering. And what we see from the colours is that the purple is people saying ‘I learned that at university as an under graduate’, the red above that is people saying, ‘I learnt that at graduate school’. Above that is people saying ‘I learnt that on the job’. And then above that, the pale blue, that says ‘I learnt it elsewhere’ and then the dark blue is people saying ‘I didn’t learn that’.

So you can see those skills, those knowledge and know-how skills, people said ‘I learned those at university, I learned those at school’.

And then in the middle, so that’s the knowledge know-how and then in the middle, those sorts of skills, are the skills of problem-solving. The skills of making a judgement, weighing up different levels, different amounts of evidence. Making choices, being able to communicate and team-work. Being able to put my argument together in a meaningful way. So for me, those skills in the middle, are the Research Project skills. What we see is that, you don’t, in MIT, you don’t learn those things at university. You learn those things on the job.

And then on the right hand side, we’ve got the professional skills, so those are the skills like understanding the business context in which we’re working and those sorts of things. So we’ve got these three sets of skills if you like, the knowledge know-how, the Research Project skills and the professional skills. You can see very much that universities have in the past have really focussed on that knowledge and know-how set of skills.

So this graph is interesting but it’s not as interesting to me as the next one. And the next one is about they asked those engineers “how often do you use those skills? In your job, in your life, how often do you use those skills?” And of course what they said was, that the knowledge and the know-how skills were crucially important, really important, you can’t do without them. But they weren’t the things that I was doing every day. The skills that I was using every day, the things that I really needed to use to be successful in my career every single day were the Research Project skills in the middle. The professional skills were important as well, but these Research Project skills, the kinds of skills that you can develop through your Research Project were the most important ones.

And so for me, what that’s telling me is that this is your global advantage. The Research Project in South Australia is similar to Research Project that they’ve got in some places in the world, places like Singapore. But they’re not everywhere, they’re not everywhere in the world, and this is your global advantage. Your ability to develop these skills and it’s also South Australia’s global advantage because we’ve got you. And so I wanted to ended just with this slide, and this is Albert Szent-Györgyi, he won a Nobel Prize for his work on Vitamin C and he said that research consists of seeing what everyone can see and seeing what no one else has thought, and that’s your global advantage. To get below the surface. And to be able to think these things and think in these ways. Take control of it because that is what the Research Project is for.