Vocational Voices: Season 2, Episode 1

**Industry 4.0 - what does it mean for jobs and skills?**

Megan Lilly: 00:01 I think one thing is to understand the place of learning, and the fact that there will be no definitive place of learning. Learning will happen everywhere and all of the time, and the importance of learning at work will just continue to grow in my view.

Steve Davis: 00:14 Hello, and welcome to Vocational Voices, the official podcast of the National Centre for Vocational Education Research or NCVER for short. I'm Steve Davis, and today's topic is industry 4.0, the fourth industrial revolution. Our vocational voices today are Simon Walker, managing director NCVER. Hello, Simon.

Simon Walker: 00:37 Hello, Steve.

Steve Davis: 00:38 And Megan Lilly, head of workforce development with the Ai Group. Hello, Megan.

Megan Lilly: 00:43 Hi Steve.

Steve Davis: 00:44 Welcome both of you to the podcast. Now, industry has never been static, even though most of us might think how industrial histories have long periods in which work and roles have appeared to be stable. However, the very core of industry is innovation and competition and change. So perhaps today's discussion is not so much about the emergence of change, but of its pace. Whereas once, changes would occur over the span of many decades, most of us are now encountering fundamental changes a number of times during a single career. Megan, I'll turn to you first because from your perspective as head of workforce development with the Ai Group, how provocative would it be for me to suggest that the next phase of industrial practice will mean the end of full-time permanent employment with one employer at a time?

Megan Lilly: 01:43 Well, that would be a wonderfully provocative thing to say, but I'm not quite sure that that's where our future is heading, at least in the near term. So I do think that there is substantial change happening out there, and we all can see it, and we all experience it personally as well, but it doesn't mean it's even changed. It's not happening everywhere at the same rate. So sometimes it's quite profound and deep and very, very rapid. A lot people get blindsided by the change, and other times it's slow, iterative and ongoing change. So I think to assume it's sort of one model of change or one model of disruption is not accurate. And therefore, I do think ongoing, permanent and full-time employment, and potentially with one employer are part of the future ahead of us.

Megan Lilly: 02:28 But I think the most important thing in that is let's just imagine that you're going to spend a lot of time with one employer and you're going to be full time, that doesn't mean you’re doing the same thing within the context of that job over that period of time. So the job will transition, but not necessarily your employment arrangements, although of course, they could as well.

Steve Davis: 02:50 Following on from that, does that mean that whatever the next industrial revolution is, is this fourth industrial revolution, it might not necessarily be one succinct set of attributes. It could actually be so disparate that some of us might notice it more than other people.

Megan Lilly: 03:11 Well, I think that's what's happening now. I think jobs that are relatively easily automated, they have some sort of routine nature to them are changing or disappearing as we speak, but in the past, they used to be more manual jobs or the jobs that [inaudible 00:03:27]. Whereas now the capacity, the digitalization and automation in our artificial intelligence, those capabilities have meant that they're actually disrupting now. What we used to, not that long ago, think were really permanent white collar jobs, such as a lawyer or an accountant or an auditor. So anything that's got a routine basis to it, whether it's manual or knowledge based, I think they are the areas we're going to see the disruption. And they don't play out in one particular area or another, so I think we need a fresh set of eyes to look at how this is unfolding.

Megan Lilly: 04:01 The next industrial revolution, I'm not sure that we're going to see stop starts to this. I'm not sure we're going to see a line that we can mark on a chat and say this one finished and that one started. I think this is an ongoing space.

Steve Davis: 04:12 Simon, what does NCVER research tell us about the mega trends that are driving this change in the workplace and in industry? What are some of the key things you're seeing?

Simon Walker: 04:25 Well, first of all, perhaps talk about what we mean by industry 4.0, because it means a lot of the thing to a lot of people, and it's an easy label to put on things. But in the context of the previous iterations of industry 1, 2, 3, it is about big data analytics, and those very recent changes in digitization. We've had computerization and digitalization for quite some time. This is the extra step that we're going through, mainly in the data driven world, but Megan did mention the nature of how jobs are changing, how uneven that is. One of the things that we've seen, and reflecting on history tells us a bit of a story here is in particular, may even refer to routine jobs, not manual jobs.

Simon Walker: 05:13 A lot of people tend to associate automation with manual jobs, that's not absolutely the case. There are plenty of manual jobs that because they're not routine are going to be more difficult to automate. And some of them are just the stuff that we probably all see on a day to day basis when you renovate your house, a plaster is not easily automated. At the other end of the spectrum, you have absolutely a trend for higher order skills. If you look at the employment changes over the last 10 years and going forward, if you speculate into the next 20 years, higher skill jobs, professional jobs are taking over, and areas of employment are declining, obviously places like agriculture, manufacturing and those sorts of things. So there's a quite an uneven split.

Simon Walker: 05:58 What comes out of that that is very interesting is that the middle skills jobs are the ones that are most vulnerable out of all of this, and Megan mentioned routine activities. So you will need non routine manual labor, you will need higher order skills for higher order jobs, but somewhere in the middle layer, which covers a wide range of occupations, they are arguably more vulnerable to industry 4.0.

Steve Davis: 06:22 And that's the A word of automation, where you've got routines. Megan, is automation a word that should keep us up at night, and we should all be shivering in our beds?

Megan Lilly: 06:35 No, and in fact, I think automation has actually been around for an incredibly long time. I remember the first time I went and saw a automated manufacturing plant and the sprayer painting was robotic arms and stuff like that, and it was all full automated. So there's nothing new about that, in fact frankly, it's improved the quality of many jobs, and taking people out of not only boring jobs, but sometimes not particularly safe jobs too. So automation is here to stay and it's been around for a long time. I think there's a difference between automation and digitization. Digitalization is a much more complex set of things happening in a production line compared to automation.

Megan Lilly: 07:17 But I don't think we need to fear it, because I think there's a lot of evidence emerging where digitalization may potentially remove jobs and often jobs that maybe they've had today, and it's time to move on from them, but it actually is many jobs get created. In fact, there's a lot of evidence about job creation around any of these waves of reform that we're going forward with, particularly including the digitized reforms. However, one thing that does happen is when jobs get lost, so they get lost, because they've been automated or digitized out of existence, it's usually a headline because it's a lot of people in one go. And so everyone remembers that story, but people don't hear the other story with lots of jobs, one by two by three by four being created all over the economy because of digitalization, so the different looking jobs in different places.

Megan Lilly: 08:12 It's a sort of an apple and banana, and we make unfair comparisons at time. But now we should not be fearing automation, and we should not be fearing digitalization. If we embrace it, it will play at will for us.

Steve Davis: 08:25 And there are a couple of other nuances to this topic from where I sit. Firstly, just because the ability to automate or digitize is available, doesn't always mean that it's employed because of social pressures or the cost of deploying it. Is that fair to say? Are they some of the factors that might inhibit the adoption of some of these new changes?

Megan Lilly: 08:55 Well, I think in any change that you would embark upon the change, because there's a benefit for the change. So you'd have to look at what the benefit is. Workplaces are much more complex and dynamic than just simply making or doing something. There's a whole sort of upstream and downstream around it, so there's a complex set of issues that go into that. And increasingly, in any workplace, whether it's automated and digitized or not, the need for higher level knowledge based skills, creativity, problem solving and sort of that EQ in the workplace, they're incredibly important things. And so that is all part of the much bigger equation that we need to think about in terms of what the future will look like. It's not just a digitalization story.

Steve Davis: 09:46 In your time with the Australian Industry Group, are you familiar with how much industry and the people in charge of corporations and companies give thought to the social impact of changes, the human impact of any changes they might make?

Megan Lilly: 10:02 Look, I think employers are acutely aware of that. I mean, most of the economy in Australia are SME, so people know each other in the workplace, and it's a very important element of how workplaces operate. My sense is that workplaces are all, in their own way, facing these challenges because they are real. All of us have got a smartphone in our pocket these days, so they're part of our life, not just our working life. They're very conscious of the new types of skills that are emerging or being required. Sometimes you can transition your workforce into those newer arrangements, but sometimes not some people. Some people don't want to make those transitions.

Megan Lilly: 10:46 So there's a lot that goes into that space, and that's, I guess, where you would say that there's a public policy priority in the sense that, how do you actually deal with those transitions for the greater good, rather than get an uneven and at times unfortunate response from it. So I think they're live issues, both from that big public policy perspective but company by company by company, because they are people. And as I say, SMEs, everyone knows everyone, and so there's a lot of imperative. I also think people fundamentally want to work for successful organizations.

Steve Davis: 11:21 That's one thing, but in Australia, 80% of our workforce is employed in the services industry. So I believe as we go into this conversation, we need to be mindful that that's where the majority of Australian workers are, which possibly sets us in a different position to the average, the global average.

Megan Lilly: 11:41 Yes, and some parts of the service industry can be heavily impacted by industry 4.0 in the broader definition that Simon gave before, and I too don't get too stuck on labels, because I think we know the trend we're talking about. Some parts of the services sector will be very largely impacted by it, but a lot of it won't. It depends how close the human interface elements, the problem solving, creativity elements and the helping side, the caring side of it will be incredibly important. So I don't think that there's any areas it's more or less impacted. I think it's going to have its own journey around all of these things. But yes, with 80% of our economy predominantly in that area, there's an opportunity to think it through rather than just letting it happen to that part of the economy.

Megan Lilly: 12:31 But that's where people are employed, which is also a little bit different than where GDP is generated from. So there's a much more complex equation sitting behind that one statistic as well.

Steve Davis: 12:42 And also, in my day job where I do a lot of marketing, I know that there's an opportunity for some businesses to buck a trend to automation and digitization if they think their hands-on human touch is going to give them a leading edge or a point of difference in the market that they can capitalize on. So in many ways, perhaps what we're going through now could open up more diversity of offering in the marketplace, would that be fair?

Megan Lilly: 13:08 Yeah, I think that would be fair, but it'd be interesting to see whether that can occur to scale or not, I think, would be an interesting question.

Simon Walker: 13:15 Well, it was interesting, Steve, that you mentioned the marketing area, because there was some work done by some of these brand new very clever analytics firms that scour job advertisements and the like, and look at how occupations are changing and the nature of the skills involved in them and their pay scales. One of the occupations they focused on was in the marketing area, because of the data analytics that you can get now from consumers, saying that that particular occupation is much impacted by digitalization and the whole industry 4.0 thing than many others. But you also mentioned the term human touch, and I think the foundation for Australian Youth or Youth Australians, has a very good expression of the growth areas that are in employment are in these higher order schools, but also in the human services area.

Simon Walker: 14:09 And we know that it's already occurring, and it's more likely to expand over time. And they refer to the two key elements of that, which is high skills and high touch. And of course, the one area if people are fearful about their jobs going or being automated or otherwise made redundant is the human skills, those innate human skills, for example, empathy, that you would require in the human services area are not likely to get automated or converted into robots anytime soon.

Steve Davis: 14:40 While you're in the saddle, Simon, I want to pick up on your past experience with the WA Department of Training, the Australian Industry Skills Committee, you've been seeing a lot of things from the WA end the world, which of course, has a big reliance on the mining sector, so if we just take ... And I know Megan said we may not have the sort of careers that we might have thought of in the past, but you might be with an employer over an extended time still, but just doing lots of things. One of the benefits of the old ways of being in a job that last for a while is you build up domain knowledge yourself. And I remember some of the big banks, they have a bloodletting every now and then.

Steve Davis: 15:24 They let a heap of people go, get in young people and they lose a heap of domain knowledge, which they then end up repeating mistakes that they could have avoided if they had those wise heads. Thinking of mining, and perhaps even more generally, do you see this is something we need to be mindful of as we trade through these waters?

Simon Walker: 15:46 I think the direct answer to your question is there is absolute benefit at developing and reskilling your own staff, rather than replacing staff whose skills may become redundant, either temporarily or on a longer term basis, with new staff. The response from employers, as one of studies showed is that it's quite different. Some are more than happy, and in fact, arguably, the highly productive firms are the ones that will actually take their own staff and retrain them and reskill them for those new occupational areas. Whereas others, and they're typically smaller, either don't have that capability or capacity and will typically replace their staff with someone who's been retrained in a new skill. So that's the first answer to that question.

Simon Walker: 16:31 Thinking about the mining context in Western Australia, one of the leading edge industries, and in particular in those large multinational companies in Western Australia, they are absolute cutting edge in the automation of their operations. And of course, that will affect their employees in what we generally call operator training, which is someone that effectively operates any sort of mobile plant or fixed plant equipment as part of a whole production chain. Now, they know their jobs are changing. Now, what they've done in Western Australia was partner with one of the larger metropolitan [inaudible 00:17:05] to develop a qualification that allows those operators to move away from their current roles to embrace the new operator of the future.

Simon Walker: 17:14 Perhaps to give you an illustration, whereas someone used to monitor the maintenance of the railway tracks across the vast landscape of the Pilbara, they'll be using drones in the future for that. So they're going to be retraining their operators to meet their requirements for the new operations of their company.

Steve Davis: 17:33 I'll just turn to Megan here, because I think you alluded to this earlier, that when there is change, it's not always bleak and the end of the world, but sometimes it creates new opportunities and new types of job to arise, are you anticipating that is likely to be our future as well?

Megan Lilly: 17:52 Oh, I do. So I don't subscribe to the change, this bleak view of the world. I think there'll be many, many new opportunities for existing workers, but obviously people coming into the workforce, which of course in challenges, well do we have the right skills and capabilities in our broader working age population? And I think that that's where the challenge then shifts to, and quite possibly not would be the answer. So we've got to really help people have a very agile skill base, and an ability to continue to learn and grow so that they can continually be on the right side of change in terms of the transitions that are happening in the workplace, and in fact the labor market, to be on the right side of all of that.

Megan Lilly: 18:38 Because we do have a world leading mining industry, and it is heavily automated, so don't look for ... That won't change, and it's a good arrangement. So where will the new jobs grow? And some of them will be sort of that personal interface, the high touch stuff that Simon referred to, that the Foundation for Young Australians have worked on a lot, and some of it sort of creative problem solving type stuff. And so they'll be tremendous opportunities and tremendous new jobs going forward, and I believe there will be plenty of them, but it is unfolding.

Steve Davis: 19:13 How confident are you that the training aspects of the VET Sector are up to the game and doing enough so that they're ahead of the curve? Because it's often thought that what you learn in a typical course is five years behind where the world has moved, and I can imagine that's just going to get further and further apart if we're not careful. How is that looking? Simon, I'll start with you and then Megan, you might have some thoughts.

Simon Walker: 19:41 Yeah. Well, certainly one of the mantras of the vocational education system for a long time has been this notion of lifelong learning, but I'm not sure that in practice that's actually been really well embraced. Now there's an imperative, because the nature of the skills, the pace of change of those skills will require a system that may still have early foundational qualification development for young people, but over their working life they will have to get smaller pieces of learning in to be able to adapt to their roles. And not even a new job necessarily, they could be in the same job with the same employer, but they'll need to upscale constantly. I'm not sure the training system right now is adaptive enough to that. Having said that, this requires the buy-in from employers, as well as individuals to want to do that in the first place.

Simon Walker: 20:35 Looking at the product development, there has been plenty of research and commentary about how that probably needs to improve. More recently, we had the CHOICE review for the Australian government that had a specific focus on making sure that the development of those products for skills and learning are a bit more nimble and just in time than they currently are.

Megan Lilly: 20:57 I think the challenge that you outlined is not just limited to the VET Sector, I think schooling and universities have a similar challenge. But focusing on the VET Sector, and Simon's articulated a lot of it very well, and I do completely agree that employers and individuals and the actual institutions within the sector need to be part of their own reform journey. And it is an imperative, so that's completely accurate. And so that does suggest that we do need some fairly substantial reform, and some of it goes to some of our core structures and pillars and the like, and there's no doubt the product. So products are usually the qualification for the training programs.

Megan Lilly: 21:41 The processes around them really do need to be thought through quite substantially. It's not that they're wrong or bad, but do they fit the purpose? Are they too rigid for how we need to move forward? Have they designed too much of the front end of the learning process rather than an ongoing or an upscaling approach? And do we adequately fund all this? I think they're very big questions. And they're absolutely on the table in front of all of us right now, and I suggest that we need some pretty substantial reform in that space.

Steve Davis: 22:12 If I pick up on what I saw in the future skills report, the Google Future Skills Report makes sense now. They're arguing that by 2040, Australians will spend an additional three hours per week in education and training. That is a fundamental mind shift, because most of us think maybe every quarter, we might top up with a little course, but we're talking three hours per week. That has a cost of productivity, but at the same time, we need to be learning the right thing and not just ticking off a course for its own sake.

Simon Walker: 22:47 Yeah, we probably may need to make a distinction here between formal learning through things like accredited courses and programs and qualifications and units. And whilst I'm not familiar exactly with what's underneath that study that AlphaBeta did that you just referred to, three hours could well be informal training on the job, learning from peers and vendors and any other source of skills development. So it doesn't have to be what we might call accredited training, and I suspect that three hours a week would be virtually impossible to expect through a formal program.

Steve Davis: 23:21 I know the Ai Group has done a lot of thinking about what we need from the education sector moving forward, and to just retackle that question slightly differently, I have two daughters aged 11 and nine, how should I be coaching them for the future? And what are you looking to from the tertiary sector, Megan, from the Ai Groups, thinking about the future? What sort of mindsets are going to need to be adopted here?

Megan Lilly: 23:50 Well, I think you've got the future living under your roof, which would be my first comment, so that's exciting. I think not limiting oneself to STEM skills, but just recognition of the role that they're going to play, I think is very important. STEM skills doesn't mean you need to be a mathematician or a scientist, because there's a lot of STEM underpinning in the services sector and the like, so I think we need to be clear about that. There's no doubt that digital literacy or a depth of talent and expertise around digital is just going to be increasingly important. But I think, really, the most important thing from a learning perspective is to keep learning, to be open to continuously learning. It will move in and out it, some of it will be very formal, such as the qualification. Some of it will be quite informal, which is probably the stuff that Google was talking about.

Megan Lilly: 24:44 The boundaries between formal and informal will probably blur more. I think one thing is to understand the place of learning and the fact that there will be no definitive place of learning. Learning will happen everywhere and all of the time, and the importance of learning at work will just continue to grow in my view. So when they enter the workforce, assuming it's the end of post compulsory education and probably a bit a tertiary education, they will enter the workforce really taking their learning experience with them. So the learning and the working or the learning and the employment will continue to intertwine to the rest of their working life, whereas of our generation, we've probably had a more stop start approach to it, because that's the way it's been structured and we've intersected in and out.

Megan Lilly: 25:32 It will be a much more continuous journey for them, and they will be a bigger decision maker in their learning journey. And that's where a lot of their direction, including employment direction will be driven from.

Steve Davis: 25:43 I think it's fair to say many of us have been able to give lip service to that notion of lifelong learning and gotten away with it to varying degrees, but it's about to become very real very quickly. But on the same token, there's a lovely case study in an NCVER report about REDARC, a company in South Australia, Anthony Kittel's the owner. They actually are putting money into their strategic plan to make sure they're incorporating disruptive technologies into all their future planning to keep them at the leading edge of anything that's changing. That is another mind shift, and is that the sort of thing that Ai Group would want to be encouraging, Megan? That sort of embracing?

Megan Lilly: 26:30 Yeah, absolutely. I mean, I think each company's got to decide its own distant journey with all of this, and I'm very familiar with the REDARC story and with Anthony. He also invest heavily in R&D every year and with his staff and their development. He has very significant investments along those lines. So it's no surprise that he is just such a leading example of a company that's grown. It's created its own future. It's got an exciting trajectory ahead of it. He gets people flocking to get jobs there because of the reputation of what he's done, and the investment you get, and your engagement in that journey while you're there. One of the core premises, of course, is that not only is the disruption happening out in the marketplace, but we can disrupt ourselves as well.

Megan Lilly: 27:23 So he puts that whole disruptive change agenda at the heart of the journey, and that I think has made sure that they're an incredibly innovative company that is also very agile and very able to cope with change and disruption, because it's part of their DNA. It's a wonderful story.

Simon Walker: 27:44 Yeah, just to add to that, we also commissioned some research from RMIT who looked at what a firm's doing in terms of embracing, in particular, digital technologies. The study defined three categories of employers, one aggressive technology adoption and skills development, keen technology adoption but cautious skills development, and those firms that have an appreciation for it, but don't have any investment in it. Now, what we have in the case of REDARC is an example of a very aggressive adoption and doing something about it by developing their own stuff, so I think that's a message for all firms.

Steve Davis: 28:26 I imagine, as we finish up now, there are some people listening to this saying we have not mentioned the elephant in the room. If industry gets more and more efficient and effective, and we need less humans, are we going to have to embrace the debate around a living wage to support people who cannot find employment, Megan?

Megan Lilly: 28:48 Well, I'm not necessarily convinced that there will be less employment going forward. In fact, I probably reject that premise. Having said that, the people that are in jobs now won't necessarily be the people in jobs in the future, so there'll be some transition around that, because of the changing nature of the skill. I do think any society should have a really good debate about how best you manage any form of transition and how you don't leave people behind. And whether it's a living wage or whether it's intensive reskilling, upskilling and educational opportunities, you can have a debate about the type of support you put in place, but I think the important point is that you need to do something. You don't just leave change to travel ahead without actually looking at the whole of the economy and the whole of the society.

Simon Walker: 29:45 Throughout the last hundred years or so, there's been points in history where people have said, "Well, we'll be working a 30-hour week or all jobs will vanish and we'll have nothing to do." That hasn't changed, and in fact, workforce participation more broadly has increased quite substantially over that period. So I'm an optimist, and I think that technology brings as much positive benefits to society and to jobs as they do anything else.

Steve Davis: 30:12 Well on that note, we should all get back to our own jobs. Now, Megan Lilly, head of Workforce Development Ai Group, thank you for your time.

Megan Lilly: 30:20 Thank you.

Steve Davis: 30:21 And Simon Walker, managing director NCVER.

Simon Walker: 30:24 Thanks Steve.

Steve Davis: 30:26 Vocational Voices is produced by NCVER on behalf of the Australian government and state and territory governments, with funding provided through the Australian Government Department of Employment Skills Small and Family Business. For more information please visit ncver.edu.au.