COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

SENATE

SELECT COMMITTEE ON THE FUTURE OF WORK AND WORKERS

MONDAY, 12 MARCH 2018

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SENATE

SELECT COMMITTEE ON THE FUTURE OF WORK AND WORKERS

Monday, 12 March 2018

Members in attendance: Senators Ian Macdonald, Siewert, Steele-John, Watt.

Terms of Reference for the Inquiry:

To inquire into and report on:

a. the future earnings, job security, employment status and working patterns of Australians;

b. the different impact of that change on Australians, particularly on regional Australians, depending on their demographic and geographic characteristics;

c. the wider effects of that change on inequality, the economy, government and society;

d. the adequacy of Australia's laws, including industrial relations laws and regulations, policies and institutions to prepare Australians for that change;

e. international efforts to address that change; and

f. any related matters.

WITNESSES

BARRATT, Dr Tom, Private capacity **13**

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NEVIN, Mr Mark, Senior Executive Officer, The Royal Australian and New Zealand College of Radiologists **1**

NORMAN, Mr David, Senior Policy Adviser, The University of Western Australia **55**

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SCHULTHEIS, Dr Marco, Chief Strategy Officer, Curtin University **55**

SEET, Professor, Pi-Shen, Director, Centre for Work and Organisational Performance, Private capacity **50**

SLAVOTINEK, Professor John, Dean, Faculty of Clinical Radiology, The Royal Australian and New Zealand College of Radiologists **1**

TEO, Professor Stephen, Director, Centre for Work and Organisational Performance, Private capacity **50**

TWOMEY, Mr Chris, Leader of Policy Development and Research, Western Australian Council of Social Service **21**

VEEN, Dr Alex, Private capacity **13**

VUKOLOVA, Ms Natalia, Chief Executive Officer, The Royal Australian and New Zealand College of Radiologists **1**

WORTHAM, Mr Ross, Chief Executive Officer, Youth Affairs Council of Western Australia **43**

NEVIN, Mr Mark, Senior Executive Officer, The Royal Australian and New Zealand College of Radiologists

SLAVOTINEK, Professor John, Dean, Faculty of Clinical Radiology, The Royal Australian and New Zealand College of Radiologists

VUKOLOVA, Ms Natalia, Chief Executive Officer, The Royal Australian and New Zealand College of Radiologists

Committee met at 08:53

Evidence was taken via teleconference—

CHAIR (Senator Watt): I declare open this hearing of the Senate Select Committee on the Future of Work and Workers. I welcome you participating today. Just for your information, my name is Murray Watt. I'm the chair of this committee and a Labor senator from Queensland. I've also got Senator Rex Patrick here, who's the deputy chair of the committee, Senator Louise Pratt from Western Australia and also other Western Australian senators: Senator Linda Reynolds, Senator Rachel Siewert and Senator Jordon Steele-John—so it's a full house here.

This is a public hearing and a *Hansard* transcript of the proceedings is being made. The hearing is also being broadcast via the Australian Parliament House website. Before the committee starts taking evidence, I remind all witnesses that in giving evidence to the committee they are protected by parliamentary privilege. It's unlawful for anyone to threaten or disadvantage a witness on account of evidence given to a committee and such action may be treated by the Senate as a contempt. It is also a contempt to give false or misleading evidence to a committee. The committee generally prefers evidence to be given in public but, under the Senate's resolutions, witnesses have the right to request to be heard in private session. If a witness objects to answering a question, the witness should state the ground upon which the objection is taken and the committee will determine whether it will insist on an answer having regard to the ground on which it is claimed. If the committee determines to insist on an answer, a witness may request that the answer be given in camera. Such a request may, of course, also be made at any other time. I'd also ask witnesses to remain behind for a few minutes at the conclusion of their evidence in case the secretariat need to clarify any terms or references.

I now welcome representatives from The Royal Australian and New Zealand College of Radiologists via teleconference. I understand that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you. Is that correct?

Prof. Slavotinek: Yes, that's correct.

Mr Nevin: Yes.

CHAIR: Do you have any comments to make on the capacity in which you appear?

Prof. Slavotinek: I'm a doctor who's trained in the specialty of clinical radiology. Also, by way of background, I have a degree in computing science and mathematical physics, so that provides me with some insights into the field under discussion.

Mr Nevin: I'm senior executive officer for the faculties of clinical radiology and radiation oncology at the college of radiologists.

CHAIR: Thank you very much again for appearing, especially at fairly short notice. I now invite you to make a brief opening statement and, at the conclusion of your remarks, I'll invite members of the committee to ask questions.

Prof. Slavotinek: By way of introduction, The Royal Australian and New Zealand College of Radiologists is the peak body advancing patient care and quality standards in the clinical radiology and radiation oncology sectors. It represents over 4,000 members in Australia and New Zealand and, importantly, our core aim is to drive appropriate, proper and safe use of radiology and radiation oncology medical services. We've made a submission and I'll focus on some of the key areas covered. Our contribution relates particularly to the impact of technological change on healthcare professions with a particular focus on clinical radiology.

I think what we, as a profession, can bring to this discussion is experience, having dealt with a constant wave of technology-driven change and disruption really since the profession began about 100 years ago. Also, we've had a recent focus and interest in machine learning and artificial intelligence, given the implications for the future and past variably well-informed statements about radiology.

It might be useful at this stage to say a few words about radiology and how it fits into health care. By way of introduction, I would say that there's been very rapid change in technology during my career in the last 25 or 30

years. It's made it a very exciting and rewarding area to work in. At the beginning of my career, things like ultrasound and CAT scanning were very rudimentary, and they now afford enormous quantities of information of high accuracy about the state of patients at the time they undergo these imaging procedures. MRI and PET scanning are other high-technology areas that provide previously unavailable information about the state of patient health.

In terms of what a radiologist does, we span the full range of events that occur during a patient attending for an imaging examination, be it an X-ray, a CAT scan or an MRI. That includes the initial phase where, perhaps, a booking is being made and the referring doctor—it may be a GP or another specialist—is looking to extract certain information about a patient. We are often able to provide advice about what is the most appropriate imaging technique. Certainly, if we can replace the CAT scan, which has a significant radiation burden, and provide equivalent or better information with ultrasound or MRI, that's one preliminary and important role of a radiologist that's often not thought about by those in the public or perhaps the technology industry. There's also a whole process of being involved in protocoling or deciding what type of imaging is done, aside from the actual imaging technique. CAT scans can be done in a wide variety of ways, that I won't go into, but ensuring the correct imaging technique is used to give the right information to answer the question about the patient provided by the referring doctor is very important. Of course, the images afterwards—there may be 700 or 1,000 in just one study of a chest or abdomen—need to be processed to ensure the right information is available to the radiologist, and the radiologist drives the secondary protocol as well.

Finally, we get to, I guess, what society or the industry is very focused on: the idea of looking at the image and coming up with a diagnosis or other information, maybe the extent of disease or the progress of disease or, perhaps, planning intervention or therapy, anther important area of activity for radiologists. So in this setting there are a number of things that a radiologist does. Most people, from the statements about radiologists being replaced, derived from the very first thing a radiologist does that it really only is a small fraction of our role, and that's perception or detecting an abnormality.

For example, if I look at a chest X-ray and there's a rounded thing in the lung there, that's the initial perception. Yes, I can see that but the value I add to the patient or the carer or the referrer is in determining what I think that lump might be due to. That involves two further stages after perception. The second is analysis. By brief way of example, that might be looking at the margins of the lesion. If it's spiky, that tells me one thing. It might lead me to look, for example, in the middle of the chest for enlarged lymph nodes. I might look elsewhere in the lungs for additional lesions. There are a range of things that will be triggered by detecting an abnormality in a second phase, called analysis. The third phase, a phase that I'll call interpretation, is really taking the findings on the X-ray, the primary abnormality that's perceived, the analysis of that abnormality and the second research for associated findings and putting it together in the patient's context.

So a white round thing in a chest X-ray in a five-year-old with a history of fever is likely to be pneumonia, and in a person with a history of mining and smoking it's likely to be a lung cancer and I'd be busy searching for spread of that disease. So there's a fair degree of complexity in what a radiologist actually does, and machine learning or artificial intelligence is, really, only at a task-specific phase. Where it might detect something round on a chest X-ray, it is not able to take that much further.

The other thing I should indicate is that machine learning may, however, provide significant benefits at this early stage, and that is improving the efficiency of a radiologist. For example, I mentioned up to 1,000 images on a single study of a chest or an abdomen. That's a lot of information, and one of the strengths of computing is processing data rapidly—for example, to do that initial perception or detection function, which is something that takes radiologists time, to search through those images before they even begin to analyse or interpret the images. An algorithm or a machine-learning process can do some of that. It frees the radiologist up for the more higher order or complex functions in rendering the interpretation for the patient to the referring doctor. The use of CT, for example, to assess the progress of cancer patients is very common. Measuring the size and extent of lesions on such CAT scans is time consuming; it's tedious; it's repetitive. They're the sorts of things that would lend themselves very well to these sorts of machine-learning processes. That's what I mean would be a major benefit to patient care and radiologists if it could be deployed, even if at this stage we don't have a general-purpose intelligence that can do the full range of functions that a human can.

As I've tried to suggest with some of these examples, radiology has been at the forefront of adoption of technology, MRI, PET et cetera within the healthcare industry. The rapid evolution of technology in diagnostic imaging has, clearly, shaped our profession and as imaging technologies and clinical procedures have become more varied complex and sophisticated radiologists have adopted new technologies and methods of care that benefit patients and support the entire health system. So we have a past and a future in this digital revolution.

Radiology, in many ways, has been the first affected and the first to adopt and adapt in the past, and some might consider us, if you like, to be the canary in the medical technology and digital health coalmine. Widespread digitisation of radiology images occurred over two decades ago. The next step in radiology is machine learning, and with it comes a range of challenges.

A digital health future presents risks and opportunities for healthcare professions. There's an intense and early focus on clinical radiology that's still very early days for artificial intelligence and deep learning in medical learning. The potential for automation is high, and I've already given one or two examples, but there are some very clear limitations, one of the most important being that there is no true general artificial intelligence at present, and machine learning is not nearly as advanced as suggested by some. It's quite rough. It might look for a round structure but it's unable to assess all of the things, for example, on a chest X-ray or a CAT scan. There needs to be a lot more work before anything is even going to approach assessment of the full range of features on an image.

Although, in a societal sense, when you drive to the supermarket and you're going into the carpark there might be a camera that recognises the thick pattern on your numberplate and then let's you out again at the appropriate juncture, that's a very simple task and only a very small fragment of what goes on within clinical radiology. It's that misconception, that all it is is pattern recognition, that has led to some of the errant statements in the past—for example, by Geoffrey Hinton, one of the pioneers of machine learning within the United Kingdom.

The other thing that's important to state, and it is a barrier to effective training of such machine-learning algorithms, is that they rely on large accurately annotated datasets, and at the moment, across the world, they are in very short supply and they take significant effort to generate. The data's a key issue and there's a specific dependence on access to high quality reliable data. There is also an importance to the role of regulations, particularly to facilitate the development of clinically justified or clinically useful machine-learning algorithms.

We need to set some realistic expectations about machine learning and its potential. Whilst we can expect it to drive new advances, from improved diagnosis to enhanced workflow and efficiency, it's a long way from the cognitive task of diagnosis of the full range of human disease and placing imaging findings in the context of the individual. I think it's important to state that we really do need to contain the hype. Overstating AI or machine-learning capabilities is not helpful. And some of this discussion, at least, in the past has been generated by technology-driven interests and, along with it, a misguided emphasis on role replacements, which makes for an interesting but inaccurate news story. Having said that, we need to also be clear that clinical radiologists will need to adapt, adopt and transform alongside the technology in the same way they have in the past.

We see a promising future with emerging technologies providing new opportunities to create value in health care but it's important not to underestimate the challenge ahead, and the health workforce will need to be supported and educated to adapt alongside the technology. That means national leadership to spearhead an agenda which places people and patient quality and safety first. We need to shift the discussions to the more realistic potential of machine learning, artificial intelligence and radiology, and balance efficiency and ethics during that conversation. All realistic expectations arise from recognising that machine learning's major function is to automate basic repetitive functions and leave the higher order cognitive skills to the experts. It is expected the technology will augment clinical care and aid human decision making.

Machine learning will help radiologists provide more valuable data-driven reports and reduce the effort required to create reports—for example, measuring lesions in CAT scans on cancer patients; detecting and measuring lesions in the brain in patients with multiple sclerosis. There are a number of such simple functions that can be automated. A clinical radiologist's work is complex and those sorts of simpler tasks I've illustrated can free up radiologists for the more complex and challenging cases that don't follow simple steps or process.

Workflow management, provision of past imaging and provision of clinical background data are all things the machine learning can assist us with. The radiologist, however, needs to remain custodian of the outputs and must maintain responsibility for the quality of those outputs. Certainly, there is a potential medico-legal implication arising from deployment of such technologies in poorly tested situations. It is important to put this into the context of other shifts happening in health care, too. We really need to deploy these new advances in technology to enable new models of care and to support value-based care, which is the way that most OECD societies are moving, and to consider preventive and population health initiatives more broadly. To be successful, such technologies will need to reduce cost, improve access, quality and, more broadly, care.

By setting some limits and establishing required structures that interact with the regulatory, legal and ethical frameworks is vital, and it is very important that that occurs during the adoption and implementation of these technologies, be they machine learning or other digital technologies that impact upon the workplace. In clinical radiology, radiologists work with patients and other doctors daily. They understand the nature of the problems to

be solved in a medical setting in order to benefit patients and health care. This understanding is much more limited in the technology industry, and past experience shows that some industry-led changes have not increased efficiency. For example, the use of voice recognition in many situations has actually slowed radiologists down. Radiology and radiologists therefore have a key role in the way this technology is applied in the real world. In order to realise its full potential at each stage of the healthcare value chains, the profession needs to lead and, importantly, to collaborate in this transition.

Clearly the application of machine learning needs to start from problems that need to be solved, not just from technical feasibility or possibility. We have to ensure that technology solves useful problems as a first priority, and here the emphasis should rightly be on patient quality, safety and accuracy. That's where establishing an ethical role for machine learning in health care is perhaps the most critical—the safety aspect in implementation needs to put patients and healthcare providers at the forefront of decision making. Our focus is on establishing standards and ethical processes to ensure the safe and effective use of technology when guiding implementation. Ensuring there is a robust regulatory regime and an appropriate authority to evaluate this technology and assess the safety implications before deployment is paramount. Placing some required limits through regulation should be prioritised in directing machine-learning algorithm development. The goal of any framework would be patient quality and safety and, if that is looked after, then resource efficiency necessarily follows.

Some of the things that I would like to see any framework manage or process are: definition of a useful purpose—so-called use cases; areas where machine learning could be directed or trained to improve patient care; and, clearly, collaboration and professional leadership, no matter which area of medicine we are talking about, would be important. We need standards that define the methodology, the tools, the metrics or measurements in training algorithms to make sure they do the job properly. We need standards to make sure these algorithms are tested so that they are safe, and the data on which they are being trained needs to be validated and relevant to the purpose of all the use case when designing such a machine-learning algorithm.

The authority needs to make sure there is adequate and safe evaluation before they implement any clinical practice. There need to be clearer pathways in developing and implementing algorithms in clinical practice and, importantly, after deployment there needs to be an appropriate process for monitoring the effectiveness of these machine-learning algorithms in practice. There also needs to be an awareness in general of the whole process and the push by industry and others to develop this at significant cost and therefore opportunity costs within health care or elsewhere in society. Forming the right policy and standards coalitions, including internationally, will help to ensure that Australia is ready for the transition that needs to occur. The college of radiologists would very much like to collaborate and be part of that. Collaboration would include governments, professional organisations, both local and international, and adequate advice and international expertise—

CHAIR: Excuse me, Professor. Sorry to interrupt you. I'm just conscious that there are quite a number of senators who want to ask questions. Do you have much longer to go?

Prof. Slavotinek: I have one sentence, which is simply: this will formalise the structure for decision control and bring in the technology and healthcare professions at this vital early stage. Thanks very much for your patience.

CHAIR: No worries. Thanks. We look forward to seeing a copy of that once it gets sent in as well. Does anyone else from the college have anything they want to say before I open it up to questions?

Mr Nevin: No, I think that covers it.

CHAIR: Great. Thanks very much for that. That was very useful. I will throw to Senator Patrick, as the deputy chair, to begin with.

Senator PATRICK: Thank you, Chair. Professor, you talked about the fact that your profession is heavily reliant on new technology and that it's changing all the time. You talked about being the canary in the coalmine. Surely there are a whole range other medical areas—and the one I'm thinking of that I have seen change over time is dentistry—that are changing quite dramatically as a function of time due to the technologies involved. Would that be fair?

Prof. Slavotinek: I think that's a very fair point. Obviously at short notice we've provided the presentation that represents the perspective of the college of radiologists as regards the imaging sector. There have been enormous changes in other areas of health care too. I don't feel I'm across all of those. Certainly dentistry has changed. The implementation of gene technology is another area of enormous change, and there are similar regulatory challenges in terms of that, which have probably been considered in other venues in the past. But, yes, you're quite right: this is not the only place where technology is having an impact.

Senator PATRICK: So flowing from that and the recommendations you're making in respect of having some sort of national policy and perhaps a national body that looks at regulations and ethics, does that not need to be looked at more broadly across the entire profession? Is there scope for that or is radiology so specific that it would require its own body to do that?

Prof. Slavotinek: I don't know that I can advise you about the scope of individual bodies. I think certainly radiology and the development of these algorithms very much require the regulatory framework I'm suggesting. I of course do recognise that there are multiple other digital changes occurring in health care. Whether all of this can be managed effectively by one body or whether there is a more piecemeal approach is something perhaps for others who understand government better than I to consider. Certainly I think that, if we don't have an appropriate regulatory framework with machine learning as it's deployed in health care, there are significant risks to patients and society.

Mr Nevin: I have a couple of other points to add to what John has said. I think that is a very fair comment. It is a health system wide scenario and multiple other specialties are going to be impacted by this. There is a lot of talk about the space of radiology at the minute because it has been digital for so long and it's already a heavy consumer of technology. There are a range of very specific circumstances related to the healthcare setting and a whole range of considerations which flow from that which relate to policy challenges—the financial implications, market access, safety considerations for this technology, ethics around its use and some of the other broader implications. We would like to see somebody like the federal Department of Health taking leadership in this space through the establishment of a high-level task force that looks at some of those big policy questions. We're very happy to feed into that debate and to participate fully in that.

Senator PATRICK: I guess that's where I was going—that maybe it needs to be looked at more holistically. I will diverge from that slightly. You've mentioned that the technology is changing and, therefore, the way in which you conduct your business changes. In terms of feedback into training organisations, are the timeframes for those changes long or short? If they're short, does it create a problem in the context of having lecturers in a university or in training schools simply not keeping up with the technology? If that's the case, what's the answer to that?

Ms Vukolova: It is without a doubt that the widespread application of machine learning in health care, should it come, will require more health practitioners to have training, understanding and experience in health infomatics. Health informatics is a field that incorporates both the understanding of the clinical context and the understanding of the technology that can enable it. I think, at present, it hasn't necessarily been a large focus in healthcare training, but should machine learning really realise the potential that the marketing at the moment is selling to all of us then it is without a doubt that a greater number of health practitioners will have to have health-informatics training. Some core bases for that should probably start coming through universities. It is one of the areas that our college is looking at for our training program. It currently incorporates a range of clinical and nonclinical skills for our trainees, and health informatics is an area that we're certainly looking at.

Senator PATRICK: I'm just wondering if there's some sort of national body that's looking at all of these aspects: the technological change, the ethics and what needs to take place to understand that these technologies are safe—

Ms Vukolova: It is a good question.

Senator PATRICK: and there's a requirement to feedback to training. Is that a function of a body, in your mind? It seems to me to currently be an open circuit as opposed a closed circuit arrangement where there's feedback to all of the interested stakeholders.

Ms Vukolova: I think it's probably fair to say that the pace of machine learning and the advance of technology has been so rapid that the majority of governments and systems are not prepared to cope with the challenge. I think that's one of the reasons we suggest there does need to be a central healthcare body that looks at the policy and the implications for ethics practicalities and assessments. I think what you're suggesting is about what we should do across the education sector, which feeds into the various workforces, both in health care and outside of it. We would probably agree with that, but we haven't bent our minds too far in that direction yet. There just doesn't seem to be a common language or definitions around artificial intelligence and what people mean, let alone any coherent response to that from any sector at present.

Senator PATRICK: A final question, perhaps to the professor, noting that you've got a computer science degree, I presume much of the stuff you're doing in radiology, the machine related stuff, is either signal processing or image processing, which is not necessarily AI. The AI would come at the end in the analysis of the imaging.

Prof. Slavotinek: Yes.

Senator PATRICK: I just wonder, noting the limited place for AI at this point in time, whether or not it's such a big game changer and noting also what you said, which was that people may be overselling a little bit.

Prof. Slavotinek: It's not a big game changer in terms of taking on the whole range of functions in the near future. You're right that in the past there have been methods of acquiring clinical data and then processing it to create images. Machine-learning algorithms are now starting to improve things so if a patient is lying on a table skew-whiff some of these algorithms can provide the images to the radiologist in a normal format rather than at a funny angle or obliquely, so there are some improvements occurring in the pre-processing of data. It will help in detecting some basic abnormalities, but what it won't do is take on the full range of functions.

It's very hard, however, to predict how fast a general intelligence will emerge. No-one knows how to create or use one at the moment. It maybe 10 years or it may be 100 years before that emerges. I guess the thrust of our submission is that as these more basic machine-learning algorithms, for detecting lumps, for example, are developed and industry wants to deploy them in clinical care, it is important they're tested and there's a correct regulatory framework, so they don't come up with false positive abnormalities when there aren't abnormalities, or they don't miss abnormalities. It's very important that these things perform acceptably if they going to be deployed. As Natalia and you have both said, there is a gap in regulation and government, and a coherent picture at this point in time.

Senator PRATT: Your submission highlights challenges for government in working through things like Medicare rebates when considering artificial intelligence in that clearly the billing rebate belongs not only to the person doing the diagnosis and to the equipment but to a range of other layers of non-corporate knowledge et cetera. How are we currently going with sorting through these issues with government? Is it on the table in any manner at all so far and, if not, what does government need to put in place to ensure that we are on top of these issues going into the future?

Mr Nevin: I am happy to take that one. One of the first steps to look at is in terms of market access for how some of this new machine-learning software will be deployed, because it doesn't typically fit into the basket of a medical device. It is certainly not a medicine. It is different from how a human being would behave. At the moment, it is in the middle of a grey space in terms of regulation. But there needs to be absolute clarity on what is safe use of this technology and what the safety hurdles are that the technology would need to cross before it can get deployed in the market. That will probably fit with an agency called the TGA, the Therapeutic Goods Administration. As John mentioned, prior deployment is a key thing but, just to add to that, there is also the post-market surveillance of how this technology is being used in day-to-day terms and looking for areas either where it is being used inappropriately or where the results it is throwing up are contrary to what a typical diagnosis would be in that space. So I think market access is probably the first place to start.

There are also other broader ethical considerations about who is responsible for the output from this technology. We would put across that it really needs to be the radiologist who is responsible for that output, because they are the person who will place it in the context of the overall patient as an individual and package that information together to send back to the referring doctor and for advice to give to the patients.

Senator PRATT: As we perhaps diagnosis more conditions or more complex conditions, what does this mean for the future of our health workforce not only in radiology but in health care overall?

Ms Vukolova: I am happy to provide an answer. It is certain at present that the area depends on skills that are in relative short supply. It requires clinicians collaborating heavily with mathematicians, information technology experts and statisticians to develop the use cases that Professor Slavotinek has mentioned and to enable local populations and their data to be used for machine-learning algorithms. In the interim, even before we get to how this technology may get rolled out, there is a discussion about skills and availability. Basically, the STEM skill set is in shortage across Australia, and we need to think about how Australia can take a leadership role in the space of machine learning and how we can enhance the careers and the professions—like I said, mathematicians, statisticians, IT experts—to get them to work with clinicians and apply the potential this represents to the Australian healthcare system.

In the situation you were describing—let's say that somehow the regulatory hurdle is overcome and the efficacy is established—it really depends on which components of the roles are implemented and how the change is rolled out. We know that the growth in how much imaging is used across the healthcare system is high. There is a great benefit in being able to see inside a patient without having to open them up or do other types of tests. So, one of the challenges will be how to sustainably help all the benefits of imaging be realised and maximise the use of computer-assisted technologies to make sense of that growth and of that promise of sustainability. Like I said, in the first instance it will be about realising the promise and, by the time we realise it, we will have a clearer

picture of what skills we'll need going forward. At the moment, it is basically a lot of guesswork, because we are really not sure in what way machine learning will change health care. We just know it will have an impact.

Senator STEELE-JOHN: Professor, in your opening statement, you said that probably where AI is at the moment or where it will be in a couple of years is in its ability to identify a lump but not to fold in the various contextual elements that then allow you to make a diagnosis. How long, in your estimation, would it be roughly before the technology can feed in those other contextual elements?

Prof. Slavotinek: I think once you get to a stage where you can take diverse sources of information and integrate them to provide a specialist opinion, you need to have a general form of intelligence. As I said earlier, that is very hard to predict. They have surveyed, for example, researchers in the field of artificial intelligence and come up with a wide range of 'guesses' as to when that might arrive. The optimists think it is about 15 years away; some say 50 to 100 years. So, I am sorry, I can't give you an accurate answer. All I can say is that it is some way away. I think by the time that arrives it will not just influence health care or imaging. I think before that happens, other areas of human endeavour, accountancy et cetera, will be affected far sooner than areas in health care, which are inherently fairly complex.

Senator STEELE-JOHN: In your submission under 'Impacts on the workforce', you make the observation that the more realistic expectation in relation to AI is that its function is to automate basic repetitive functions. We have heard a bit from professionals in the law space, and although it is unlikely that I am soon to be able to engage an AI barrister, a lot lower down the scale, the clerking roles, which serve as entry points to the law profession, will be automated at a faster rate. Can you give us an idea of what, if anything, those kinds of basic repetitive tasks play in the overall employment pathway and whether you would see any effects there.

Prof. Slavotinek: Again, it's a speculative response, but one of the areas where machine learning will facilitate things is, for example, providing past images, previous reports, laboratory data available to the radiologist, who would then put this all together as a higher function. So I guess it is support for provision of those things. Individuals who do that may be affected. In areas where, let's say, the radiologist is working in the private sector and the receptionist maybe contacts some referring clinician to discuss an important finding that will change management, that sort of communication function could be taken by AI, which at least makes the contact and puts the two specialists in touch in a more efficient way. That is another way that influence could occur. Perhaps the booking process might be automated by such a machine-learning process or series of algorithms, effectively—so, a little bit like the threat perhaps to India and the call centres. There may be some improvements there. Bearing in mind, you still need to have the radiologist able to advise on appropriate imaging at that early stage. They are some thoughts but, unfortunately, not defined impacts on individuals. I am really not at that stage of understanding.

Ms Vukolova: Adding to that, in terms of radiologists specifically, there are some exciting projects going on about automation and machine learning in functions like, for example, normal organ delineation or image enhancements or, as Professor Slavotinek mentioned before, measuring the staging of cancer in the imaging over several time periods to really see if the cancer size has changed. Those are examples of automation that could greatly enhance the current clinical practice. I think it would be really well received and could perhaps work very well in the workflow of the current clinical practice and ease some of the loads on the clinicians and their staff.

But, across the board, imaging is delivered in a team setting, and every team member, both medical and other health professionals, has a complex range of tasks. It would be impossible for all of them to be fully automated, but some of those basic ones like I said, like normal organ delineation, could be greatly assisted and already are, in some cases, by computers. I don't know if you, John, want to clarify this.

CHAIR: I need to cut you off there; we're a little bit over time. But feel free to give anything adding to that to the secretariat as an additional submission, if you like. Thank you very much for your time. We were very keen to hear from you given, as you note, there is a lot of hype about the effect of technology on radiology, in particular. I think what you've been able to tell us has clarified a lot of things in our minds, so thanks for your time.

BOSTON, Mr Henry, Executive Director, Chamber of Arts and Culture Western Australia

[09:36]

CHAIR: I now welcome the Chamber of Arts and Culture Western Australia. I understand that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you. I would like to invite you to make a brief opening statement, and we'll have a range of questions for you after that.

Mr Boston: Thank you. I'd like to start off by acknowledging the Whadjuk people of the Noongar nation on whose land we meet and pay my respects to their elders past, present and future. I'd also like to thank very much the committee for the invitation to address you today. The Chamber of Arts and Culture WA is the peak advocacy and promotion body for the creative industries in Western Australia. Whilst the chamber has not made any submission to this inquiry to date, I would like to address some of the points of the terms of reference from a creative industries' perspective.

On the future earnings, job security, employment status and working patterns of Australians point, there is a widespread international consensus that the future of work will be driven by creativity and innovation. A key element in predictions of a sustainable and livable future is the need for a set of creative and social skills that prioritise the place of human creative capacity. These assertions are supported in recent reporting, commentary papers and studies from organisations that range from the Australian Council of Learned Academies—ACOLA—and PwC to the World Economic Forum, the OECD and Nesta from the UK.

Artists have great experience in managing working professional lives and professional practice—challenging, shaping and driven by technological change. There's a piece of work by the Australia Council called *Making Art Work: A summary and response by the Australia Council for the Arts* that found that creative work is predominantly and increasingly undertaken on a freelance or self-employed basis—that is, 81 per cent of artists, up from 72 per cent in 2009. That piece of work was released a couple of years ago. With artists blending creative arts related and non-arts work, eight in 10 artists are mixing their practice with other work within and outside the arts, with some applying creative skills in other industries. I make that point because I am trying to illustrate the adaptiveness of the sector and those who work within it.

The creative industries sector is one of the most flexible sectors due to its constant adaptation to an ever-changing context. The most recent Industrial Revolution—some call it the third; we might be in the third or we're about to hit the fourth—from say 1960 to the turn of this century saw a technological revolution in terms of how we make and access creative work. The sector has learnt to work with the technological advances and employ these changes to enhance how the voice of artists is heard or seen. The ongoing experience of artists and arts organisations in managing and navigating disruption provides significant learnings that are relevant to this inquiry. They have also been among the first to face challenges of digital disruption to business models and income streams.

Artists, arts business and the public are continuing to experience a range of positive and negative impacts from disruptive technologies and to adapt the way they engage make a living. For example, the use of digital technology by artists has been captured in several studies around the world and at least 65 per cent of Australian practising professional artists require some form of technology in the process of creating art. Digital platforms are driving new business structures with younger artist developing and navigating new distribution mechanisms and channels. In fact, the gatekeepers of old are under quite significant pressure due to the flexibility and use of these new digital platforms. Across all age groups, the clear majority of Australian artists—70 to 80 per cent—are using the internet to promote their work. Four in 10 are selling their work online through their own site, including 50 per cent of visual artists and craft practitioners. A similar proportion are selling through a third-party site, including 50 per cent of musicians and 64 per cent of composers.

Regarding the different impacts of that change on Australians, particularly regional Australians, depends on the demographic and geographic characteristics. Creativity is strong in regional Australia. Regional artists are integral in sharing the stories of regional and remote communities and reflecting the nation's depth and diversity. The Australia Council for the Arts study *Making art work* identified that one in six professional Australian artists live in regional towns or cities and one in 10 live in rural, remote or very remote areas. Over time, there has been a shift in the reported impact of location on practice, with a larger proportion of regionally based artists now reporting a negative rather than a positive impact. While there may be a range of factors influencing the experience of regional artists, there is some indication that difficulties encountered in accessing the internet in regional areas could be a partial explanation to this turnaround.

Regarding the adequacy of Australia's laws, including industrial relations laws, regulations, policies and institutions to prepare Australians for that change, I would like to talk a little bit about the area of copyright. New

online copyright infringement research published by the Department of Communications and the Arts shows that while more Australians are using streaming services to access content legally, one in four Australians consumed illegally downloaded or streamed content in the past three months. This means that one in three Australian writers, visual artists and composers have experienced copyright infringement at some point in their career.

There are particular implications for the work of cultural groups, communities and traditional owners where current laws do not provide substantial protection for intellectual property rights. The online availability of Indigenous designs has facilitated unauthorised reproduction and enabled Indigenous style and designs to be produced at a fraction of the cost of the authentic works. Considering that almost one in 10 first nations people—8.8 per cent—in remote Australia receive income from first nations art, the inadequacy of current intellectual property rights has significant economic and social impacts.

Finally, I would like to talk about the need for STEAM, not STEM in our education systems—that is, including arts in the current push for science, technology, engineering and mathematics training. What we are facing now is the increased automation of manufacturing and other repetitive tasks, in which there is little level of creative or empathetic thought required. However, this will place increased responsibility on those people who develop, oversee and refine such systems to ensure that they are human friendly. Empathy and divergent thinking is becoming an essential ingredient in any scientific, technological, engineering and mathematical undertaking. Yet current government policies are pushing an increased emphasis on STEM whilst reducing the number of courses and subsidies for creative courses. In short, we are in danger of producing a generation of workers who will know the price and measurement of everything, but the human value of nothing. This does not bode well for Australia as the clever country.

CHAIR: Thank you very much, Mr Boston. I appreciate you linking all of those to the terms of reference as well. That was very easy to follow.

Senator PRATT: I wanted to drill down into your statement about access to the NBN and the relative disadvantage that many practitioners now find themselves in when they are trying to keep up with the current economy of how arts works. Clearly, I think you're explaining how the internet is accelerating some art markets and art practice; but if you don't have access to that in your regional location, it's putting you at a greater disadvantage rather than being of benefit to artists. Can you explain in a Western Australian context what those relative disadvantages versus advantages look like in a more practical sense?

Mr Boston: We're one-third of the country. We have a number of remote and regional centres, but I think we are probably unique in the states in how far-flung those are and how few large population groups we have outside of the capital city. For regional artists in Western Australia, the lack of a decent internet speed has made it very difficult for them to carry out any complex tasks that require download speeds that would be more than the usual that we get here. I can't give you exact figures on the download speeds, but it certainly is a recurring theme in our conversations that we have with our regional artists. For Country Arts WA, which is one of our member organisations, it is a recurrent theme with their members that they talk to.

Senator PRATT: In terms of economic opportunities for places like remote Indigenous communities, the arts would be a cornerstone of that, whether that's visual arts, music or other cultural content. Would you place a high priority on ensuring those communities have good digital access?

Mr Boston: I think the figures are something like that we have over 30 per cent of Indigenous artists who produce 40 per cent of Indigenous art in Western Australia. There's a significant group there. Yes, given the remote location of a number of those communities, it is essential that they have good internet access and speeds to do their business online when they are downloading images or transferring images. Visual arts is the predominant art form that is sold in those communities. Yes, it would be really important.

Senator PRATT: In the context of the future of work, what you're suggesting is that we need to be mindful within not only the arts but also other economic sectors that we will leave communities behind from the future of work if we don't allow that technological access to keep up for them.

Mr Boston: Yes, I think that would be true. I think it's across any industry as we become increasingly mobile in the way we do business. Location should become less and less important if we service those communication systems properly.

Senator PRATT: Have you seen any examples of the kind of communication systems that do work well in remote locations?

For example, I have seen particular problems where individual households are required to have internet access, whereas with community-based access you can set up a community-wide Wi-Fi network. That sort of thing might work better.

Mr Boston: Community resource centres were set up by the previous state government, which I believe now have reduced funding under the current government. Some of those have worked better than others.

Senator REYNOLDS: Good to see you again, Mr Boston. I want to pick up on the issue of STEAM. I couldn't agree with you more that this is where we need to go in our education system. We shouldn't just look at STEM but also at the arts and creative thinking. The question is: how do we progress that? Cecil Andrews High School now has a STEAM facility. Do you have any thoughts or suggestions on how to value STEAM as much as STEM?

Mr Boston: It's really interesting that, when you go to preschool or kindergarten and perhaps the first year of primary school, a lot of the activity is about creative play. Whether it's playing with model clay or some other activity, it is very much based on a creative learning process. After that first year you start dropping that off and have a lot more rigid learning. The arts then become an optional extra. Within the last two years the curriculum introduced an arts stream for pre-primary through to year 8 on the belief that, if you don't have people by year 8, you're not going to get them at all, which is sad. Those streams are quite limited—it tends to be either visual arts or music—but there are so many other ways in which you can develop people's creativity.

It would be wonderful if we had a vision for this country where everyone has the opportunity to develop their creative potential. This is not just about people who wish to go into arts and culture as part of a professional learning, but rather about how we enhance the ability of people to contribute to the community and the workforce. The more we give them opportunities to learn and develop their divergent thinking—which is what the arts do by opening up possibilities in solution finding—rather than closing them down and taking a mono approach to problem-solving.

Senator REYNOLDS: You're describing an approach where arts and creativity are not separate optional subjects. You're describing the competencies of creativity and innovation which should be embedded across most, if not all, subjects. You are suggesting a core training outcome.

Mr Boston: Creativity is certainly something that needs to be nurtured. Innovation, I must say, is an overused word. It is that ability to make that leap of faith that is seen as innovation but you need the training or the grounding in creative thinking to achieve those things.

Senator STEELE-JOHN: Are there any international examples where folding STEAM into the curriculum is done really well? The Netherlands or Finland?

Mr Boston: I do know that the Netherlands do it very well.

Senator STEELE-JOHN: How do they approach it?

Mr Boston: They have it mandated through their education system to have creativity as part of a training process, a learning stream, within the education system from an early age.

Senator STEELE-JOHN: Thanks, Chair.

CHAIR: Senator Siewert.

Senator SIEWERT: Thank you. I want to go to the issue of the use of the internet. I'll focus on music because I know that from personal family experience. There is now a lot of collaboration internationally. People are communicating across countries and boundaries. They're probably doing it with visual art as well. In fact I have a little bit of experience—not my experience, but that of close family members. What do you think all of this means? In Australia, when we talk about adding to the economy here, when you have this international collaboration—it seems to me, then, that we're getting rid of country boundaries and it doesn't really belong to any nation. How do we then build that in? If we are talking about the future of work, how does that translate into people being able to earn a significant income out of it? They are also using open-share software, which then impacts on people's ability to earn income out of it as well.

Mr Boston: You're touching again on issues to do with copyright and the ability of people to earn an income that reflects the creativity they put into it. That will be an ongoing issue, it will be something you will need to look at from a regulatory point of view—the international copyright—and it is something that you need to reach an agreement about, not just within the country but internationally, as to how fair use is termed, as opposed to free use.

Senator SIEWERT: Thank you for that. It seems to me that it also goes beyond that, in terms of the way people think about it and the ways they are sharing and collaborating. They are doing it in a way where they freely share their ideas—and I take on board what you've said about artists and how eight in 10 are actually doing other jobs as well, and I understand the issue also about creativity and it's use in other jobs—but, if people are going to continue to earn at least part of their living in paid employment and out of their art, it looks like we are

going to have to pay more attention to how you do that internationally, and work across nations. People are truly collaborating on the internet; I am aware of people from Latvia, Australia, other European nations and America all collaborating on producing music, for example.

Mr Boston: Sure. I don't know whether there's one simple answer to this.

Senator SIEWERT: No. I don't think there is. But where do we—

Mr Boston: You will have your own protections within your legal system within the country that you are actually operating in. I don't know; for me, if I go into a relationship in which I'm collaborating with somebody, I'm fairly clear about the terms on which I am going to be collaborating with them. I would want to have those terms clear in the first place. My previous existence, working as an agent with Australian artists and taking them around the world, required a lot of that detail to be sorted out, to ensure there was a fair return for the work that was put in by those artists.

Senator SIEWERT: We're talking about some quite young people who are doing this, and they're the workforce we are talking about—

Mr Boston: I would suggest that there be better training, for them to have a better understanding of the conditions under which they are creating their work.

Senator SIEWERT: Okay. Thanks.

CHAIR: Thank you. Senator Steele-John.

Senator STEELE-JOHN: Thank you. It most of what I was going to say was probably covered by Senator Siewert. Could I just come back to the STEAM/STEM conversation. You seem to be suggesting that the way we use art is more as a vehicle for education during the first few years of interaction, with the education system and then it becomes optional and more marginalised as we go towards graduation. Do you see that, alongside making it a whole-of-curriculum focus, there should be more focus on arts as the delivery mechanism for other aspects of the curriculum?

Mr Boston: I think you could look at something like Scitech for an example of something where science is delivered through—

Senator STEELE-JOHN: That is exactly what I was thinking of.

Mr Boston: Obviously there is room for that. I come from a sector in which we are very proud and fiercely protective of the intrinsic value of the work that we do. But at the same time we are also sufficiently pragmatic to know that there is a lot of instrumental delivery that comes from arts and culture, whether it be delivering knowledge in other areas or whether it be health outcomes, whether it be law and order, et cetera. Arts tends at times to be quite a loaded word. I sometimes call it the 'green vegetable on the plate', because people quite often have very small thinking about what 'arts' means. I see it as much broader than the high arts area. It has the ability to help us to understand our world. And 'understanding our world' is not just the human condition; it has the ability to help you to understand scientific and other areas of learning.

Senator STEELE-JOHN: Thank you. That's all for me, Chair.

CHAIR: No worries. Senator Patrick.

Senator PATRICK: Thank you. Mr Boston, you sort of painted this picture of art having old school, new school, rural, metropolitan, online, offline evolution. The picture I got was one of cats scattering off in all sorts of different directions—not in the Andrew Lloyd Webber sense.

Senator Steele-John: You should [inaudible]

Senator PATRICK: Maybe I should. Forgive the analogy, but is there anyone herding the cats here? Or is that undesirable? Should we be looking at this from a national level and working out how, as technology changes, we assist all of the different players, be they old school, new school, rural, metropolitan et cetera?

Mr Boston: There are a few bodies out there. Obviously, you have your own government body, the Australian Council, the arts funding body for the federal government, the main one anyway. I believe the Australia Council put a submission in for this inquiry. Yes, indeed, there is a need for an overarching position about where these changes and the future of making art will be, as the context changes quite rapidly. As I said, we've gone through rapid change, and in many ways I think the arts have been heavily affected, as I said, by the changes that have happened since that, sort of, third wave came through. Preparing us for the fourth wave, and making sure that we are work-ready in that sense in the sector, there is certainly a need for a body that can help us do that. There are some training organisations. I believe in Western Australia we have something called FutureNow. There are other industry councils in other states that look at making sure that there is a pipeline of people that are well trained

coming into the sector. But the sector itself is constantly expanding, and trying to keep up with the nature of that expansion is very testing for a sector that is by and large very poorly resourced.

Senator PATRICK: Okay. The other thing follows on from what Senator Pratt said and a concern I have. Just talking about the NBN, you're suggesting that the rural sector is at a disadvantage. Is that the only issue that you see rurally?

Mr Boston: It's not just the rural sector. I could take you back to my place and you'd find out what poor NBN is.

Senator SIEWERT: Please let's not start.

Senator PATRICK: Yes. But are there things other than the NBN? In terms of rural art, are there other inhibitors that are causing what you said was a decline?

Mr Boston: I think the major one would be the access. Previously there had been a complaint that we just don't have a critical mass of artists in those communities to be able to bounce off each other and have that community there. Obviously as technology is changing you suddenly have this huge community online and you can share and create things, as we know, across borders not just from the regional into the metropolitan. Therefore, being able to provide regional artists with the tools becomes even more critical if we are to realise their potential.

Senator PATRICK: So in effect the big remedy for you would be better connectivity.

Mr Boston: I think it would be a remedy for most people, but especially for regional artists, who do not necessarily have the other options, short of travelling.

Senator PATRICK: Thank you.

Senator REYNOLDS: I very much liked your opening statement. You talked about the arts community and what the arts community here already has to offer. That perhaps is not well understood or well captured yet. I'm wondering what you think the sector itself—organisations like yours and others—could do to make more public and more widely known the offering that your sector actually does have for the future of jobs. Is this something that you think is for government or is there a role for your sector to lead from the front a bit further on this?

Mr Boston: I think there's definitely a role for the sector, but I have to say, having done three submissions in the last month, we try to do our best according to the small resources that we have. Our desire is to make arts and culture central to political and societal thinking. That's the big hairy goal. We try our best to ensure that we do raise those issues not only to understand what the current contribution is from the creative industry sector but also to understand what the potential is with a little bit more investment from both the public and private sectors.

Senator REYNOLDS: No-one really knows your sector as well as you and those who work in the sector. Just listening to your comments it struck me that it could be a way forward for the sector itself to do some more analysis and to refine what you said in your opening statement today and, as I said, really lead from the front in terms of what you've got to offer, because I don't think the things you went through this morning are necessarily widely understood in the community more generally.

Mr Boston: No. A very good initiative was announced last year by three philanthropic organisations. It is now called the New Approach. It is looking at having a national advocacy body that can explain and promote the contribution of the sector nationally. I think that was given to the Academy of the Humanities and Newgate, which are a Canberra-based lobbyist group. They've appointed Kate Fielding as director. She used to be on the Australia Council. She comes from Kalgoorlie-Boulder. She obviously has an good understanding of the regional aspects. She started earlier this year. One of their tasks will be to provide a voice in Canberra regarding the contribution of the arts and culture sector.

Senator REYNOLDS: That's very good. I'm not sure we were aware of that, so that's very handy information.

CHAIR: Thanks very much, Mr Boston. It is great to have some input from the arts and culture sector, so thank you for your time.

Mr Boston: Thank you.

BARRATT, Dr Tom, Private capacity

GOODS, Dr Caleb, Private capacity

VEEN, Dr Alex, Private capacity

[10:11]

Evidence from Dr Veen was taken via teleconference—

CHAIR: Welcome. I understand that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you. I understand Dr Barrett is going to provide an opening statement on behalf of all of you. Then we will open it up to questions.

Dr Barratt: Thank you to the committee for this invitation. Just by way of a preambulatory statement I thought I might introduce the three of us and the context in which we have made a submission. I am a lecturer at the School of Business and Law at Edith Cowan University. Dr Goods is a lecturer in management and organisations at the University of Western Australia. Dr Veen is a scholarly teaching fellow at the University of Sydney. The three of us have known each other for a while. We all have an interest in studying work and employment relations. So we all broadly have an employment relations background. That's what brought our attention to the issues under consideration today.

I will explain the submission and the research project which it covers. This occurred at the end of 2016. There was a lot of commentary and a few academic papers that had emerged out of the gig economy, looking at the future of work in the gig economy and what it means from a regulatory point of view. What struck the three of us was the lack of primary data and actual information from the workers about the consequences for their working lives of the emerging gig economy. Initially when we were doing the planning for the research we thought we would look at Uber, the ride-sharing service. Then we found a few better resourced and slightly more organised research teams had started looking at Uber, so we turned the project to looking at food delivery workers. This is Uber Eats, Deliveroo and Foodora, the on-demand food delivery applications that you see in central business district around the country now.

The research design was a qualitative design. It was based around actually going and talking to the workers. This involved quite a few Friday and Saturday evenings walking around entertainment districts finding riders who are, more often than you'd think, idle and willing to have a chat about their experience of work. We ended up speaking to 58 workers in interviews that ranged from about 10 minutes in street-intercept interviews when we talked to them while they were on the job to further interviews that were in a little bit more detail off site at their houses or in coffee shops. It was all covered by the University of Western Australia's ethics approval. So there is anonymity and confidentiality for the riders who we interviewed.

I will give you the broad overall findings. We found that there is a very large international cohort doing the work. Of the 58 workers we spoke to, 47 were international visitors. So they were working holiday visa holders and student visa holders. That may even understate it based on the number of people we spoke to, because a number of workers had such limited English that they weren't able to engage in an interview or didn't quite understand what was going on and we didn't have the language skills to speak to them in their own languages. That finding was quite interesting to us.

Secondly, these workers were all engaged on an independent contractor basis rather than as employees, and, as we did the data collection in the first half of 2017, the platforms moved to make it a requirement of starting the job that the workers had their own Australian business number, so they had to register their own business. The work was done and paid on a piece rate basis. So the worker would log into the app, which was in many cases translated into their home language, so you could read the app in French or in Portuguese or whatever you wanted to do. Then, once you were logged in and had your GPS turned on, the algorithm would allocate you work. It would tell you the address of the restaurant at which you would pick up the food. Once you'd picked up the food it would then give you the delivery address and you'd take the food to the delivery address. Then, once the delivery was done, you'd be paid on a piece rate basis, which was relatively similar between the two platforms. One had a flat fee and one had a flat fee plus an incremental distance type extra payment.

What the workers found in general was they were paid significantly less than the minimum wage on average, so we're talking generally about $10 or $12 an hour before tax, and this had declined during the period of research. So, at the start, when there were fewer riders, the workers could make slightly more money, but as more participants entered the marketplace the average earnings declined. There was great variability between the work, and obviously with piece rate work this is perhaps to be expected, but it is that idea that, unless there are jobs and you're being allocated work, you don't get paid. So workers could work for periods of time without payment.

In terms of working patterns—and this is something we found very interesting in terms of the research—there was a lot of flexibility as to when the workers could and could not sign into the application to get jobs, and the workers saw this as a very positive aspect of the work, as that is some control and autonomy that you wouldn't have in a cleaning job or in a restaurant job, which they saw as their labour market options. While they had that autonomy and flexibility, the market dictated that people tend to eat and order food on a Friday and Saturday night, so, while there was that flexibility, if you wanted to make enough money by which you could survive and sustain your holiday or your study here, then you had to be logged in at certain times to be able to make better hourly rates. Dr Goods, do you have anything you want to add?

Dr Goods: I think generally speaking the workers had fairly mixed views around the work they were performing. As Tom mentioned, the flexibility dimension, particularly as students, was really important to them, but equally questions around economic security, and occupational health and safety security, were a major concern, given that they're undertaking work on bicycles and scooters primarily, engaging in traffic, where risky behaviour takes place. But, maybe given the cohort, the unexpected large international cohort, there was quite a lot of social interaction and social enjoyment, and maybe this is because they communicated online to each other. There was a high proportion of Brazilian riders meeting, talking, problem-solving—those sorts of things. I think that probably gives a nice intro to the research project.

Dr Barratt: To situate the research more broadly—obviously this is a very broad Senate inquiry; it looks at the future of work—our research is a qualitative project looking at one sector of the gig economy. The gig economy is so wide, with Airtasker and all the broad jobs that can be done. We're looking at food delivery within the gig economy within the broader changes in the future of work. In terms of our statements we're more than happy to caveat that our findings are based on this little niche, but we think they are indicative of some wider changes.

CHAIR: Some of the submissions we received earlier in the inquiry—I suppose I'm particularly thinking of the Centre for Future Work, in Sydney. The point they made was that, while the gig economy is new and exciting, it really could be seen as the latest form of exploitation that has been going on for some time, and this is just a new form that happens to involve an app as well. I'm just picking up on your point that the gig economy isn't the be all and end all. It's happening in a broader setting, which is having impacts widely.

Dr Barratt: What's interesting about that from our point of view in terms of looking at a new form of exploitation—and academic colleagues of ours have made that point as well—is that what's different about this is that often we've seen a lot of exploitation, particularly with immigrant workers if you think of the rural sector and the service economy, 7-Eleven type situations, and that all happened in breach of an employment relations system that already exists; whereas the independent contracting relationships that exist within the gig economy have separated this into a completely new set of rules.

From a regulatory point of view, I think there is a significant difference there in terms of this as a new form of exploitation. It's a new form of exploitation which is, under the current system and according to the recent Fair Work Commission ruling, one that is legitimate and acceptable under the system. From a policy point of view, it's our position to put to you what we found and then for the senators and governing bodies generally to respond to that and say, 'This is the current regulatory circumstance.' This is happening outside of it. We, the three researchers, believe this is an unanticipated shift, and as such the acceptableness or not of that is worth considering.

CHAIR: It's a good point that it actually is happening in a deregulated environment rather than as a breach of an existing regulated environment. On that, I notice that one of the recommendations you made in your submission was to provide additional mechanisms for worker voice within the gig economy. You've made some specific suggestions about what could be done there. Would you like to build on what you were just saying and explain why you think that's necessary and what that might look like?

Dr Goods: A number of the workers expressed to us frustration because of independent contractor status. If something goes wrong and the organisation or platform that they're working on doesn't give them an opportunity to raise concerns or have a satisfactory outcome, the worker is bearing most of the risk, and so they felt like their voice was missing in this. Mostly the focus is on the platforms, the customers and the restaurants from their perspective in this context. They felt that they only avenue they had was taking legal action, which for these individuals is obviously extremely expensive given they're international students, backpackers and those sorts of things. We thought creating a mechanism where they were able to express that voice would be a good outcome for a less financially onerous option for them rather than taking the expensive legal route.

Dr Barratt: As for the form it would take, we have offered some suggestions. It's not by any means meant to be a definitive list, but there are other ways of thinking about how you might regulate the gig economy to expand

Fair Work's purview beyond just employment relationships into these contracting-type relationships or of looking at the ACCC as a way of saying these are contracting relationships. Maybe they have a role here, or maybe there could be a gig economy type tribunal that recognises that there are different contracting or employment dynamics going on here or a hybrid of the two and there's a new and specialised way of regulating.

CHAIR: There are obviously different views about how this issue should be dealt with. At one end you've got people who think the existing arrangements are completely fine and who take a very market based sort of approach. We've also heard from people who think that delivery workers like those you've been examining should actually be classified as employees and then subject to all the pros and cons of employment. But you're sort of putting forward, it seems, something in the middle which accepts that these are independent contractor type relationships but that they need some protection. Is that a fair assessment?

Dr Barratt: Perhaps our view is slightly more nuanced than that. Whether they are considered independent contractors or employees is a test, and there are different test that exist. I'm sure I don't need to explain to the committee the difference between the tax office's test, Fair Work's test and occupational health and safety type tests. But, with the idea of these workers and how you regulate them, our view is more that this is a phenomenon that's happening. It's something where there are real problems, and Caleb talked about a couple of those before. How do you respond to that? Yes, making them employees is one option. Yes, treating them as independent contractors and saying the status quo is fine is another option. There are some that, as you say, hold a view that this is fine and provides opportunities for workers who might not otherwise be able to access labour markets.

To create a third category—and I think we speak to this a little bit in the examples of international regulation part of our submission—is something that's relatively dangerous from an employee rights point of view. If you are regulating the gig economy, we think that you'd need to strictly delineate what you're regulating as the gig economy. We talk about examples from Europe and North America. What you might see is a phenomenon where employees who have the protection of national employment standards and those sorts of things start to become categorised as these dependent contractors. Rather than creating a safety net for these gig workers, you're actually undermining the protections that exist for normal employees. I've not necessarily given you a solution, but it's something to be mindful of. These regulatory adjustments that might be made for the emerging gig economy will have consequences across the wider employment relationship and contracting relationships that exist.

Senator SIEWERT: I was going to that area of your recommendations where you were talking about undermining workers. In your submission, you talk about overseas examples. Could you outline that a little bit more. You said:

It has the capacity to extend protections to vulnerable workers, as it has in Canada, but also has the capacity to erode the conditions and protection of workers…'

That has happened internationally?

Dr Barratt: Yes. Italy would be the major case. Caleb and I met with a visiting academic from Italy last year, and that was one of his major reservations: if you create this intermediate category, what that has the capacity to do is to shift employees who had the protections of employment—in Australia, the National Employment Standards and those sorts of ideas—into this dependent-contractor relationship, which has fewer protections for vulnerable workers.

You can set up worker and customer or employer relationships in a number of different ways. Whatever the system or framework of rules that exists at the time is, you can set up relationships that fulfil particular roles or meet particular regulatory criteria, and so what you might see is the rewriting of employment relationships into dependent-contract relationships, and that's the mechanism by which that would happen. So, you'd fall under a different bucket of protections.

Senator SIEWERT: I want to take a step back into the whole issue around the gig economy. You went deliberately to food delivery, and, as you said in your opening statement, this is just part of the gig economy. People talk broadly about the gig economy and disruptions et cetera. It seems to me, when we're looking at the future of work, we have to separate out that area of the gig economy in which a lot of international people are involved. I'm not saying that's not important, but, if we're talking about the broader Australian workforce and the gig economy, we have to look at it in much finer detail in terms of the impacts on our future workforce.

Dr Barratt: The difference would be between employment relations and contracting relationships. The point of the gig economy is to set up contracting relationships. While the gig economy is very broad—it might be someone to come and construct some Swedish flat pack furniture for me; that's also the gig economy on a one-off basis—what you see in the employment relationships is a lot of protections that are just given because there is an employment relationship, and the National Employment Standards are built around that. When you have

contracting-type relationships, you see more of the market power of particular actors dictating the terms and conditions of the contract. The example that we've spoken a little bit about is a wedding photographer. They have a lot of market power—the capacity to dictate prices, terms and conditions of work and the conditions upon which the photographs are distributed. If you have a customer with less power and a worker with more power, because there is a contracting relationship you're more likely to see favourable conditions for workers. When you say we need to separate out all of the different elements of the economy—

Senator SIEWERT: You can't separate all of them; I understand that.

Dr Barratt: No.

Senator SIEWERT: But we have to realise there are different arrangements and power imbalances et cetera.

Dr Barratt: Exactly. And so that might be a way of understanding the different categories or subcategories of the gig economy, and the way of understanding work is looking at the relative power of the two parties as opposed to trying to categorise it by industry or job or those sorts of things.

Dr Veen: If I may interject and add something to that—I think the other aspect, when we talk about the nature of the gig economy, is this classification that's emerging within the literature in terms of looking at the type of work within the gig economy that we're focusing on. These types of work that we've looked at, like food delivery and ride-sharing, are very much platform-based forms of work which happen within a specific country and need local human interaction. Whereas if you look at the emergence of more cloud based forms of work, it becomes much greyer as to where the work is being conducted and for whom and where in the world. When we are talking about this subsection of platform based work within the gig economy, we see it taking place within particular geographical boundaries and nation-state boundaries. So when we look at regulatory questions, it becomes much murkier when we try and look at the cloud based section as well.

Senator SIEWERT: Yes. In fact I asked our previous witness about that. We were actually discussing culture and arts, but that's exactly the nature of the question I was asking. Where you're working across international boundaries—I didn't call it cloud based, sorry; I just called it internet-based—those are the sorts of issues too. Is there any literature or somewhere you could point us to so that we can have a broader look at that?

Dr Barratt: Work has been regulated more traditionally based on the place at which the work occurs. If you shift your factory to Cambodia then work gets done in Cambodia under Cambodian law. It's that sort of idea. In terms of the gig economy, in many ways it's immaterial, from a customer point of view, where the work gets done. Graphic design is a classic example. You build the select committee logo, outsource that to the cloud, and the logo designs might come from anywhere. The rules that govern the terms and conditions of work are wherever the worker is. Again, that's not a solution, but thinking about how you actually regulate it is thinking about where the work occurs.

I understand, when you were talking to the previous witness, that work can occur in three different places at once, and it becomes increasingly difficult. So another way of regulating it might be look at it from the customer point of view, if the work is being commissioned in Australia, rather than looking at the traditional way of work being regulated in a place that it's being done.

Senator SIEWERT: But what happens if you're collaborating on work that hasn't been commissioned? I understand your point about commissions, but what happens when, for example, the reverse happens and you're collaborating not for a commission work but you're selling it?

Dr Barratt: That's a very good question. Again, we come from this from an employment relations point of view—

Senator SIEWERT: Yes, I take your point.

Dr Barratt: so that's probably getting beyond the scope of our expertise.

Senator SIEWERT: I take your point, but it's still an interesting question.

Dr Barratt: Absolutely.

Dr Goods: I think if you're interested in looking at some of the academic literature in this space—we've got a reference to Aloisi. That journal has a special issue on this sort of cloud based gig economy work, and there are a few papers on cloud based work, what it means and the challenges around it.

Senator SIEWERT: Thanks.

Senator PRATT: In the examples you're studying, you've highlighted that they're both student visa and working holiday visa holders in the main. These visa types seem to be playing a stronger and stronger role in certain parts of our economy and creating two classes of workers; whereas typically we would have had people on

those visa types doing more mainstream jobs. What does that tell us in terms of the future of work in terms of people who are seeking to access the Australian labour market and doing so by doing jobs that don't meet our typical labour conditions here?

Dr Goods: When we started the research, we didn't have an expectation that there would be such a high number of visa holders working in this industry. The question is: why is that the case? For many of them, they thought it was a better option than the other labour market options—for example, working in the restaurant industry where they also might be paid cash in hand outside the regulatory system. There was also that degree of flexibility, if you're a student, for example, in fitting it around your studies. But, from the interviews, they had a keen sense that they were getting paid less than what Australians were typically being paid. They also had a sense that they didn't think Australians would do this work and, I think, why would they do this work, as well. There are some real challenges. We write in the submission about the '20 hours a week' challenge. Some of them saw this as a potential workaround of that legislation. Whether or not that's the actual case is debatable. There were attractions to coming into this type of work over other forms of labour market options.

Senator PRATT: In terms of the future of work in Australia, noting that international education is a key export for us, do you get the sense that peoples' primary motivation is to earn a bit of income while they're studying or is their primary motivation to enrol in study in order to access an Australian labour market?

Dr Barratt: From the interview data—and this is very much interview data that was captured at a point in time—coming to Australia would be the primary consideration because these jobs didn't necessarily exist when these people enrolled in their degree or program or when they came for their working holiday visa. It was very much emergent as we were researching that this work existed. They found it as a way of managing and balancing their life as students or as backpackers.

Dr Goods: To add to Tom's point, some of them made the point that they were seeking more standard forms of work in the labour market. They might have finished their university degree, studies or whatever, but as yet hadn't been able to find that work. This allowed them to survive until they hopefully found more traditional forms of employment.

Senator PRATT: What do we need to watch for in the future to make sure we don't end up with that relationship of this being emerging work versus it probably not being enough to pay for their education and living expenses? We have to make sure that we continue to get that balance right in terms of impacts on education and other parts of the economy.

Dr Barratt: Some workers who were trying to sustain themselves while they were here noted that this was negatively impacting on their study. They would be logged into the app for maybe 45 hours a week and then come home and not have the energy, concentration or capacity to then fully engage with their studies. Beyond that, if you turn to our recommendation 4, it is about better data as well—finding out how many of these workers there are, how much they're being paid, where jobs they're doing and how it balances with their studies. This is an exploratory qualitative study that indicates the bigger issues, like the ones that you're pointing out. Better data will lead to better policy in this case.

Senator PATRICK: I have some questions. Uber is reported as not making money, yet their workers seem to be exploited. There are almost no winners in this. Are we looking at a sort of dotcom type of arrangement where eventually that collapses and something more normal flows from it?

Dr Barratt: I want to take issue with the workers being exploited in that it's a little bit more mixed than that. We've looked at wage rates and occupational health and safety, particularly in the Western Australian jurisdiction, but the workers were doing it for a reason as well. It had a number of benefits. I take your point more generally—and I'll answer the question—but, to be clear about this idea of exploitation, it's something that we found was a mixed picture across the different cities we interviewed the workers in. From an individual subject of worker point of view, they had their reasons why they were engaged in this kind of work.

Senator PATRICK: Sure, but I wonder if that would change if there wasn't such a power imbalance.

Dr Barratt: Absolutely. To take the broader question about how sustainable this is, we obviously look at this from a worker point of view. We anecdotally have spoken to people who've used the services as well, and that might be where the real winners are coming from. The idea of having cheap, on-demand food within 20 minutes is something quite handy if you're a consumer who's interested in those sorts of products. In terms of the broader company strategy—I really don't wish to speak on Uber's behalf here—looking at the strategy, it might be that they're looking for market capture. The idea is that maybe the price goes up or the amount that they extract out of the production relation increases later on once they have normalised the product and captured the market—those

sorts of things. I'm not sure it's necessarily going end up in the way that you characterise, but I'm not convinced it won't either.

Senator PATRICK: I guess I was asking a question, but the other thing is you describe remedies to different jurisdictions having different approaches, either judicial or regulatory. I have a couple of questions. In the history of your looking at industrial relations where something new happens across multiple jurisdictions, do you end up converging into one reasonable solution? And, if that were to occur, does the business end up being sustainable in a situation where we do regulate and where we do have judicial precedence that places an obligation upon the ride sharer or the food provider?

Dr Goods: Good question.

Dr Barratt: This is, again, slightly outside of our area of expertise. I do very much understand the point and say: what is the point at which consumers would have to pay or restaurants would have to pay or the company would take less money in order to have desirable outcomes for all three parties? We are doing some research in the first half of this year with some other colleagues at UWA and ECU, looking at the consumer side of things and their willingness to pay more money for the same product if it meant workers were treated less exploitatively. We haven't done the research yet so we don't know the answers, but it would be quite interesting.

In terms of that single, best-practice regulatory framework, I'm not sure even that would be the case or the solution, though. The example I point you to is in ride sharing in Indonesia. Go-Jek is a large ride-sharing company there—it's an equivalent of Uber. We have some colleagues at Sydney uni who are looking into this much more closely than we are, but the consequence has been a lot of informal work has become semi-formal or quasi regulated, and that's actually lead to a lot of benefits for workers because, rather than coming from a position of downgrading standard employment, it's coming from a position of upgrading informal employment. In terms of finding the regulatory consequences—the consequences of policy interventions—it's very much dependent on where you're intervening. I'm sure it's going to be different in Australia, like we're talking about, to what's happening in the Netherlands at the moment. Maybe, Alex, you can talk a little bit about the changes we talked about the submission now? But that idea that the place in which the work is being done is really significant, here, for the regulatory answers. Alex, did you want to talk a little bit about the developments in—

Dr Veen: To add to that, Tom, I think it's reflective of societal discussions around the desirability of these forms, the platform base, of work. If we look at some of the discussions that are happening within the European Union—which we pointed out in the submission as well—there are some questions around whether this type of work is more a form of false self-employment rather than an actual independent contractor relationship. Within the Dutch parliament, some questions were raised about the desirability of the independent contractor model as set up by Deliveroo and adopted, more or less, across different jurisdictions. There, there was a discussion that these are not desirable forms of work and that it needs to be critically evaluated to see what broader society will gain out of permitting this type of self-employment.

That leads into one of the aspects that we raised in the submission as well, trying to gauge and understand what the broader societal consequences are of allowing these workers to be paid below minimum-wage standards and what might be some of the spillover effects into other delivery services and low-paid sectors. We're not labour economists but, again, this could be further investigated with follow-up studies. But what is important—and this is one of the papers that we've been working on—is when we're looking at the quality of this type of work we shouldn't only consider it from the individual worker point of view, neither, necessarily, the labour-market perspectives, but also look at what the broader societal consequences are.

What we highlighted, for instance—and what my colleagues spoke about in relation to insurance coverage and things like that—is that we found with some of these workers they reported having to use Medicare or insurance claims for work-related injuries, which traditionally would fall on a WorkCover capture. Across different jurisdictions they are trying to deal with this type of issue, and that's what we've been trying to point out, illustrating the fact that in some places there are serious question marks. From a broader societal perspective it's desirable that this platform base of work, operating in its current setting and set-up, continues. What we are seeing as well is difference within the food delivery sector, as we pointed out, with some of the platforms providing insurance coverage, whereas others don't.

Senator PATRICK: I'm just wondering, if we get to a point where the parliament intervenes and fixes some of these areas for workers, does the whole system collapse because it relies on the fact that they've handed that responsibility to the individual employee or the contractor and if they are forced to take on that responsibility their model collapses?

Dr Barratt: But, in general, and I ask this in as abstract a term as I possibly can, is that necessarily a problem? If the business model's based upon societally undesirable consequences or outcomes, or it provides societally undesirable outcomes, should that business model persist?

Senator PATRICK: I guess the point is if the parliament intervenes and creates obligations, does that cause it to stop?

Dr Goods: I think the point you raised about Uber ride sharing not turning a profit so far, despite its seemingly huge growth if we go back to the research we did in the food-delivery segment, and think about the other key player—which we've only done some off-the-record investigation into—the restaurants, they aren't finding it terribly beneficial for their business model either. I think workers and the restaurants, in this situation, are both struggling, so the feasibility of this sort of industry seems pretty questionable. We're not economists; we're focused on labour relations. But, anecdotally, it seems highly problematic.

Senator PATRICK: The nice thing is if you're an economist you don't have to be right, so you can be in the same camp!

Senator STEELE-JOHN: I want to, firstly, clarify something that I think has just been covered but so that we have it in really clear terms. In your submission you detail, basically, a phenomenon that seems to me to be similar to what we see in the US, where the non-existence of a sustainable minimum wage means that low-paid work is subsidised by different facets of the social security system, causing a drag on that system, if you know what I mean. That seems to be what you're documenting here, because people are having to access Centrelink or Medicare for protections that would otherwise be provided by the employer. Would that be an accurate summation of what you observed?

Dr Goods: Yes.

Dr Barratt: Yes. In a couple of cases, this is what happened. Workers either got injured at work or even outside of work and that limited their capacity to work. Obviously, they don't have access to sick leave and those sorts of things. One individual I interviewed ended up on Centrelink for that reason. It is the idea that where, in standard employment relationships, there's a workers' compensation scheme the insurance is paid by the employer—in Western Australia, which is our experience—and then that insurance covers workers who are injured and can't work in these circumstances.

Senator STEELE-JOHN: So we effectively have a situation where the social security system is subsidising these companies because they are not currently fulfilling their obligations.

Dr Barratt: In some cases, definitely; that is correct.

Senator STEELE-JOHN: In any of the cases, with any of the people you spoke with, were they able to tell you what they were doing before they were working through these platform services, or did they have any previous employment experience in Australia?

Dr Goods: Yes. Some of them had worked in other industries, primarily in the services hospitality industry—restaurants, cafes and places like that.

Dr Barratt: And otherwise cleaning. Definitely, how they perceive these gig jobs is relative to cleaning work and restaurant jobs that they either had worked in or saw as their other reasonable short- to medium-term market options.

Senator STEELE-JOHN: Did they feel that these jobs were better than those?

Dr Goods: In many instances, yes—not always, but in many instances, yes. It was mainly the sense of autonomy, flexibility, controlled dimension that was very attractive.

Dr Barratt: But from a methodological standpoint I'd point out that we were interviewing people who were still doing that work and hadn't quit, because there's a very high turnover and so there's obviously going to be a bias towards people who do see the benefit in this as opposed to those who try it and exit, which—

Senator STEELE-JOHN: Absolutely. That was my thought process exactly. With the other end of the spectrum—we have the danger of creating a third category, which might bring down existing standards—you observed that the UK has not minced words and said: you are an employee and everything applies. I know that's a reasonably recent decision, but is there any observable evidence of what the impact of that has been on employees?

Dr Goods: Not that I'm aware of, no.

Dr Barratt: Not that we're aware of, no.

Senator STEELE-JOHN: Basically, what you're identifying here in the gig economy is a false sense of flexibility. Uber made a statement to us in Sydney and flexibility was a key part of their pitch. That you theoretically could have flexibility but you effectively have to go where the work is would be very much the case with these delivery services. Is that something you've observed generally within the gig economy, with Uber and other services: that you have to go where the demand is?

Dr Barratt: It wouldn't be as binary as Uber saying it's flexible and the workers saying it's inflexible, because there is the ability to arrange your life. A nice example I have is a guy who wanted to go to a wedding and worked extra days for two weeks before so he could have a weekend off. That's genuine flexibility that the workers see as beneficial. He can mediate his income over a period of time to allow him to do something he wouldn't be able to do if he were a cleaner. However, on a weekly and daily basis you need to be in particular locations at particular times for the work to occur. If you're working in an outer suburb between nine and 11 o'clock in the morning you're not going to make any money; that's that idea. Sorry; what was the second part of the question again?

Senator STEELE-JOHN: I think you've covered it. My great fear in this space is that if you look at any other business which pursues a similar kind of method you see this is about market capture. Once your competitors are driven out of the space, you're the prime mover and you tick that 25 per cent up, because you have no other option. Is that something you've observed, broadly working within your focus, elsewhere with these gig platforms or, indeed, in this delivery space?

Dr Barratt: I've remembered the second part of the other question, which was about whether the work is truly flexible in that sense. It's on-demand work. The work is on demand, so wherever the demand is that's where the work must be. It's driven by the consumers in that sense.

The last point that I'll make, in the interests of time, is that even while we were researching these workers from week to week the terms and conditions of work would change. Not necessarily pay rates, but some of the incentives and some of the requirements of workers would change on a week-to-week basis, so there is definitely the capacity of the platform to tweak, change or to quite substantially—

Senator STEELE-JOHN: Can you give me an example?

Dr Barratt: For example, one of the platforms had an incentive where workers, if they made three deliveries in a two-hour period, would get a bonus amount of money. Some workers found that problematic because they thought that after they'd done the second delivery they wouldn't be allocated work; they would never get that third delivery because the app would give it to someone else. So they actually changed the incentive to be: if you were in a particular location at a particular time you would earn 1.2, 1.3 or 1.4 times the base rate. So that idea of incentivising changed during the first couple of weeks of our data collection. That wasn't driven by the workers; the platform just changed the rules. They were the new rules, and then workers had the option of exit or they could just continue.

Dr Veen: Workers are very much price takers. I think that's the point that my colleague Tom is trying to make. What we found is that the platforms had the capacity to change the terms and conditions of the work downwards, so workers reported that it was getting increasingly hard to make a decent income from this type of work, as well as the fact that there seemed to be more workers undertaking this type of work across the various locales where we looked.

CHAIR: It's been excellent hearing about your research. It sounds very interesting, and I for one would be very keen to see the new research you're doing about the attitude of consumers as well, once that's ready. Thank you very much for your time.

Proceedings suspended from 10:54 to 11:06

TWOMEY, Mr Chris, Leader of Policy Development and Research, Western Australian Council of Social Service

CHAIR: I now welcome the Western Australian Council of Social Service. I understand that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you.

Senator SIEWERT: Chair, I should declare that I am married to Mr Twomey and so I won't be asking any questions.

Mr Twomey: I should declare my undying love for Senator Siewert.

CHAIR: We will get your submissions on living with Senator Siewert later. I now invite you to make a short opening statement and at the conclusion of your remarks I will invite members of the committee to ask questions.

Mr Twomey: I'll start by saying Kaya. Ngala Kadiitj Whadjuk Noongar moort, Keyen Kaadich nidja boodja.u It is an acknowledgement in the local language of the Wajuk people of the Noongar nation, who are the traditional owners of the land on which we meet. I will keep my introductory comments fairly brief. I'm hoping you've all had a chance to look over our submission. We have tried to include a fair bit of detail on trends we've seen in the changing nature of work, both at the national and particularly the Western Australian levels. One of the things that has been of great concern to us, given our role in advocating for disadvantaged and vulnerable Western Australians, has been the rise of underemployment and precarious work. Some of the trends we've seen, as discussed by previous witnesses, are around the gig economy and how a lot of the protections and conditions that were developed over many years around occupational health and safety, minimum wages and superannuation and the retirement system are being eroded by the business model that has been developed there.

One particular concern is: at what point do we see these trends moving into the home-care arrangements for seniors and people with a disability? We are very concerned that, while there is a very strong and welcome push in giving consumers more control over the services they want, we need to make sure that both they and the workers are protected in doing that, because there is a very real risk that, if we move into independent contractor arrangements, people may not realise that they are responsible for the people who are coming to deliver services in their home if anything goes wrong. They can wear a lot of financial and personal risk around that.

We have also highlighted in our submission growing inequality and we are concerned that that has been a drag on growth. We discussed issues around resilience, and the mobility and responsiveness of the workforce and how that has been undermined as the social security system has failed to keep up with the changing nature of work. The current social security system is very much a 20th-century model, where people who were in long-term secure work would have a period out of work and then transition straight back into a similar role. We are seeing more short-term employment, more underemployment and more precarious employment—particularly people in precarious work with uncertain hours and income. It's extremely hard for them to negotiate the social security system, particularly if there are differences between the amount of money or work they're told they're going to get during a reporting period and what they actually get. People often get in trouble with the system when there are problems with the way things are reported by their employers.

We're also concerned with some of the implications around retirement. We've included in our submission a pile of recent research that we've done on our cost-of-living work around the impact on age pensioners and whether they own their own home on retirement. The modelling that we did around that was quite stark in the differences that it showed up between those who own their own home on retirement and those who don't. A couple on the pension who got the full amount of rent assistance were lucky if they had $13 left for discretionary expenditure at the end of the week compared to about $120 if they owned their own home. Certainly, what we see in the trends and statistics is that already half a million Australians at or approaching retirement age do not own their own home, and the trend shows that the number will double over the next decade or so. That's going to be a significant impost on health and social services, and it's something that we really haven't been planning for or responding to.

One of the other things that we included for the first time is some recent work that's been done around the value and contribution of the care economy. We included some recent work that was done in the OECD that looked at seven different OECD economies, including Australia, and compared the knock-on stimulatory impacts of investment in the care economy versus investment in physical infrastructure, construction and so on. That highlighted that the impacts on the economy were close to double. It showed that it was particularly around women's employment and closing the gender wage gap. I suggest that you look at that work. The other thing I would add to that is that the modelling and information we have around health and community services suggests the growing demand for these services. For instance, in Western Australia, the state training board is predicting that, by 2030, employment in this area will double or even triple, but, at the same time, at the state level we don't have a training and workforce development strategy around that and a lot of the courses that used to do that in the

TAFE system have shut down or aren't getting the enrolments they need. That makes it very clear that, at some point in the future, we're going to look at importing a migrant workforce to deliver care services for us, which seems very short-sighted. If we are looking at the information around the stimulatory impact of the care economy, it gives a very strong argument for us to use that as an economic strategy to manage economic downturns and to counter-cyclical investment so that we can smooth out the economy and develop a future workforce, as well as boost the return of people's health and wellbeing.

A similar thing that we've highlighted in relation to that specifically focuses on an Aboriginal human services workforce development strategy. So far, a lot of the work that's been done at a state level around Aboriginal workforce development has focused on the traditional areas: work in the resources industry and construction or work in municipal services. There is the rise that we see in the demand for people in health and community services, plus the triple benefit that training and employing local Aboriginal staff gives in this area, in terms of a return to the local economy and having more responsive services because you are getting people with lived experience who are involved in developing and designing them in a more culturally appropriate way. Then there are service users who are more trusting of the service, particularly in a lot of the areas where we've been struggling to close the gap because we've been failing to engage those who are most at risk in prevention and early intervention. We're only seeing them at the pointy end of the service system, which costs us the most money. I think I've probably said more than enough there. I'm happy to go to questions.

CHAIR: Thanks very much for a really detailed and well researched submission. I haven't had a chance to go through all of it, but there are lots of interesting graphs for all those policy wonks out there! This is really useful. You have some very interesting research and figures around some issues to do with employment in WA that are quite different to other states. One of the points of bringing a hearing like this to Perth is to hear about what is different in WA. Would you like to take us through that, whether it be about underemployment or—

Mr Twomey: Certainly. A couple of figures that we have there that are WA specific really look at the growth of unemployment and underemployment as well as how that's translated across men and women. One of the things that you can see very strongly is the boom-bust cycle that our economy has been through. But one of the things that it's also highlighted is that, as a consequence of that, the trend has been much stronger in Western Australia than the rest of Australia, in terms of the growth that has happened in employment being in part-time and casual work, and the amount of underemployment has increased more dramatically here. That is particularly true of women rather than men, although we have seen that trend across both.

Senator PRATT: Is that also for young people as well?

Mr Twomey: Yes, that's definitely true. In fact, that's quite well highlighted in the submission from YACWA, who are on this afternoon.

CHAIR: I'm from Queensland, and we've gone through our own transitions, but I don't think they were quite as pronounced as what has happened in WA post mining boom. Is there any evidence that any of that is starting to even out as the WA economy picks up a bit?

Mr Twomey: It certainly has, but I suppose one of the things that we've found that has been concerning is that that has happened with the general economy but there have been particular areas that have been quite sticky. So one of the things that's been a big concern to us has been rental affordability for those on the lowest incomes. And one of the things that we saw was that in the immediate aftermath of the boom the median rental rates came down quite dramatically—particularly for rental at the high end—but for the rents for those on a lower income were quite sticky because there was undersupply in that part of the market, because the supply has very much been driven by the capital return rather than the rental income. So in those areas people weren't in a position to move to somewhere else that was affordable nearby and they weren't in a position to renegotiate their rent with their landlords. So we have seen a few of those trends, which has been concerning.

Senator STEELE-JOHN: In regard to the impact of the 'gigification' of employment on the care economy, when we were in Sydney we heard from the CPSU, I think it was, although I could be wrong about that. They were talking about two platforms which currently exist. I think one was Airtasker. Can anyone else remember the other one?

CHAIR: We were told there was Ubercare. I don't know if that's actually a brand name.

Senator STEELE-JOHN: There were two with a third on the way was the impression I was given—with a nominal starting rate of $9 an hour and no particular background beyond the normal 'no qualifications required' and things like that. Could you take me a bit more deeply into what your concerns would be about a care economy dominated by that kind of work?

Mr Twomey: I suppose one of the issues here is that there are both risks and benefits. There certainly are benefits in opening up how we are doing age and disability services to give consumers a lot more choice and control around the types of services and support they need. Often there can be a pile of quite simple domestic tasks and so on that something like Airtasker may be quite well suited to for getting in that type of support. The concern is when that starts crossing across into more of the critical and professional care services that people require—in particular, as well, is people's ability to understand the choices they are making and what the implications of those are. If it means they're effectively being the employer of the people coming in and delivering services, the services may appear to be a lot cheaper and they may feel like they get more service. But then they're particularly wearing an occupational health and safety risk. There may not be the same standards, rules and regulations that apply around people's training and accreditation, and these sorts of things. They may not then have the insurance that they need sitting behind that if something goes wrong and either the consumer or the worker is hurt. I guess it's the balance of those things.

The other thing for us is, looking forward into the future, we conceive that a lot of these jobs are increasingly skilled ones. We're wanting people who can work across different disciplines to be able to provide more integrated models of care so that they're more wraparound and more responsive. The problem is if, at the same time, the way that we're employing them is actually driving their work conditions down, we're not going to get those skills happening. There's a real balancing act there around, yes, how do we give more choice and how do we deliver more services more cheaply to people, but also how do we make sure that there are good jobs there and that we're developing the care workforce we need so that, when it comes to those really critical human services and those more complex needs, we've actually got the people there that we need to deliver them.

Senator STEELE-JOHN: Whatever perspective you bring to the consideration of this question, it's pretty clear that significant parts of the economy are currently, or will soon be, in transition. Part of that transition will unfortunately involve people falling through the cracks, and none of that retraining or adaptation is made easier by the fact that the social safety net currently, if you fall onto it, leaves you below the poverty line. I guess that would be behind your recommendation regarding the increase to Newstart?

Mr Twomey: Yes, absolutely. The other concern that we have is that the combination of the uncertainty and the level at which the payment for a lot of these services has been set is stopping a lot of the existing services from investing and developing their services or planning their services or training their staff. There's a real risk that if that doesn't stabilise—if the return isn't sustainable—then we'll see a lot of the existing services hollowing out or disappearing. That's been a concern for a whole pile of the medium and, particularly, regional services that are having to transition from a grants based model where they would be paid up-front to a payment model where they're getting payment in arrears. That means they've got to find finance and meet the cost of that finance, and so on, to deliver their services without actually knowing what level of service and payment they're going to get. There's a huge amount of that uncertainty out there.

Senator STEELE-JOHN: That'll do me, thanks.

Senator PRATT: The submission you've put forward makes recommendations with respect to our social security framework and its responsiveness. You've called for a review of that, noting insecure work and part-time work. What do you think such a review would find in terms of what needs to change around the current system?

Mr Twomey: I think the core thing that it will find, given the changing nature of work—the uncertainty and the amount of transitions that we see—that people who are unemployed or underemployed or in and out of precarious work are facing, is that we need to be increasing people's resilience, their ability to be able to respond and their ability to be able to travel for work and prepare themselves to move around and respond where there are opportunities. What we've done over the last decade or two is the opposite: we've actually reduced people's resilience, we've put more and more requirements around what they're doing and we've reduced a lot of the things around liquid assets, and all these sorts of things, so their financial resilience is very much undermined. In fact, the level that we're paying them at is simply insufficient for them to be able to seek work. It's to the point where it's creating a barrier. We haven't seen a rise in that for 20 years.

Senator PRATT: So, if we looking for greater flexibility in our workforce and within the economy, you're essentially saying that the current social security system is a constraint on that flexibility in terms of being able to make a contribution to the economy?

Mr Twomey: Yes, and I'd say it's also very much an unnecessary constraint. In terms of where we've come in this period in the capacity that we've got around data systems and reporting on financial income, we could actually have a much more flexible system that could be sure that it's going to be able to balance things up at the end of the day, at the end of the month and at the end of the financial year. So we could actually allow people a bit more flexibility around their income, we could simplify a lot of the reporting requirements and we could

actually make it so that it was more responsive and people had more capacity to respond when they were moving in and out of work, particularly when their incomes are very uncertain, because I think we will increasingly find that that level of uncertainty, combined with that level of financial hardship and precariousness, is going to have wider and long-term impacts. Certainly there's some research there that we quote around what we already know about the psychological impacts of long-term unemployment and underemployment.

Senator PRATT: Thank you. In that context how would we go about assessing the economic impacts of structuring our social security system in a way that doesn't facilitate people's access to employment and I guess facilitate and encourage economic participation because of its punitive nature?

Mr Twomey: I think that's a very good question, and it would be a good one to ask my colleague behind me here when he's up. I think there are two things. One is: what is the opportunity to look where we've got natural experiments where we can do comparisons between other OECD countries that have got similar economies but very different social security systems to see what the impacts around there are? The other thing is then you're getting down to how do you actually go about modelling those impacts. That's the stuff that I'm not sure how to answer.

Senator PRATT: Okay. So essentially we need to have a look—and it's covered in your recommendation—at the social security system not only in terms of its role as a social safety net but in terms of the extent to which it enables flexibility that supports that in and out of the workforce, not that that's necessarily what we want to encourage but, if that is an inevitable trend, then we've got to look specifically to how we help people fill those gaps in their employment.

Mr Twomey: The other thing I would add to that as well is that, looking forward when we're actually concerned about our international competitiveness and where we go next when we're looking at decreasing productivity gains, one of the greatest opportunities that we've got is engaging and enabling those who are currently the most excluded from the economy. Anything that we can do that actually puts them in a position where they are able to make more of a contribution will have much more of a dramatic impact on our economy than anything else. One of the simplest things that we know from our cost-of-living work is that even the smallest boost to the wages of low-income workers goes immediately back into the economy because they spend so much more of their income on the basic standards and basic costs-of-living issues.

The other thing that I forgot to mention is that we also included in the submission some of our research that we did using WA financial counselling data. This is the first time we've been able to do this comparison and the first that we know of that it's been done anywhere. We compared that to the recent ABS household expenditure data. It showed very dramatically that the rises to housing costs in particular and utility costs to a lesser degree had impacted most dramatically on those on the lowest incomes. You could see as a consequence that they were cutting down on their health and recreation spending—stuff that we know will have long-term impacts on their health and wellbeing and longer term costs to our economy. So it's getting to the point where it's actually having some negative long-term impacts.

Senator PRATT: Yes, so, in terms of the future of work, it's the extent to which work today can keep up with one's living expenses?

Mr Twomey: Yes, absolutely.

Senator PRATT: In the context of underemployment and the increasing inequality gap in Australia in terms of capital and who has access to capital in the context of job creation, have you picked up any trends in that regard?

Mr Twomey: The trend we've highlighted has been twofold. There's been that clear and rising gap in underemployment. The other thing that's been a concern has been the gap we've seen between increases in productivity and the returns to the workforce. As you know, that's got to the point where we recently had the Reserve Bank governor coming out and commenting on the fact that there's been a huge gap between workers' wages and the increases in productivity they've delivered over the last few years and it's a concern because it's to the point where it's a drag on economic growth.

CHAIR: I know we've covered this a little bit, but could I ask about your recommendation that we need a review of the social security system to modernise it and bring it up to speed with the fact that people are now moving in and out of less secure work. Have you got any early thoughts about any specific changes that need to be made to the social security system to bring it up to date?

Mr Twomey: One of the most obvious things, I guess, is that the system has evolved over many, many years in an ad hoc sense. It's become extremely complex, and even those who are working in it often get confused about how things work. One of the first things is: can we move to a much simpler payment system that applies across

the board to everyone who is entitled? You then look at: what are your top-ups around particular areas of need, be they age or disability or parenting—all those sorts of things? Certainly it is the ability to do that.

I think it's also the ability to be a bit more flexible in terms of people with uncertain incomes—to create some ability to smooth their income out a bit more over time. It is giving people the benefit of the doubt when it comes to the initial reporting of their income, knowing that you can catch that up over time because, at the end of the day, you'll be able to see what happens through the tax and transfer system.

CHAIR: With regard to the point you made about smoothing out income: I noticed that in your submission you talked about there needing to be some changes to the application of reporting periods and compliance activities. Is that the same sort of concept?

Mr Twomey: Yes.

CHAIR: With regard to what you've said about the social services workforce of the future: I think everyone recognises there is going to be—there already is—explosive growth in that sector, and we've talked in brief about some of the dangers of it becoming a highly deregulated sector. Again, are there any particular suggestions you would have that would avoid us going down that track?

Mr Twomey: I think it's part of the same wider question about what we are actually doing with these kinds of disruptive platforms and how we catch up our industrial relations and occupational health and safety systems to match the changing nature of work. It's clear that, while the new technologies and platforms have been part of enabling these more responsive systems, the biggest way they're saving the money is by bypassing the cost of the existing regulation, and that's regulation we put in to protect people—occupational health and safety, superannuation income and so on. By bypassing those they're simply spreading those costs to the wider community.

As to the question of how we deal with some of these kinds of arrangements, which are almost sham contracting arrangements, where people are defined as independent contractors, there is a model in Europe of a dependent contractor arrangement which says: if you are acquiring just about all your income through one particular employer, you're not, in a sense, an independent contractor and there should be a higher level of regulation and protection around some of those things.

CHAIR: I don't know if you were here for what previous witnesses had to say. They said that the introduction of dependent contracting in some jurisdictions had actually led to undermining of employees, because there was a tendency to push employees into becoming dependent contractors, losing the benefit of employment.

Mr Twomey: Yes.

CHAIR: There are some risks associated with that.

Mr Twomey: I think the risks there are about how you define your rules about what counts as a dependent employment relationship. It may be that the idea of a dependent contractor is still problematic, and it's the whole way that we've allowed contracting to be defined so loosely that we've been able to push a lot of existing employers into contracting arrangements where they're effectively still an employee of an organisation. Maybe we simply need to tighten up how we test what really counts as an employment relationship. At what point is an organisation actually responsible for you and committing to you in that sense?

CHAIR: I've got one more question. The only other point in your submission that I don't think we've touched on is your recommendation that we provide some incentives to allow the growth of worker cooperatives and mutuals and that sort of greater employee participation in decision-making. That is something that's been raised with us in some of the previous hearings as well. Would you like to elaborate on that?

Mr Twomey: I think one of the areas where it's been most successful is where you've seen existing operations and industries that have been forced to close down due to financial mismanagement rather than actually because of the viability of the particular workplace or what they're doing. So creating the opportunity for the workers to take that over, or even just over time increasingly become shareholders in their own workplace, is a way of making it more resilient. In a sense, you can see that it's one model that gives you quite a different and flexible response around how you might deal with some of these industries that are perhaps being increasingly marginal in a financial or globally competitive sense but are still very much delivering necessary supplies to industry in our local community. Whereas, you might say that the high-level financial competitiveness might not make them attractive to capital to invest in, but, from the workers' point of view, if they know they can build a particular widget and people will buy those at a reasonable rate of return, then being able to keep them employed and delivering that in Australia rather than closing down a particular workplace or industry and sending it overseas makes a lot of sense.

CHAIR: Thanks very much for coming along today.

DUNCAN, Prof, Alan Stewart, Director, Bankwest Curtin Economics Centre

[11:37]

CHAIR: I now welcome the representative from the Bankwest Curtin Economics Centre. I understand that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you.

Prof. Duncan: It has.

CHAIR: I invite you to make a short opening statement and then we'll ask some questions.

Prof. Duncan: First of all, let me thank the committee on behalf of the **Bankwest Curtin Economics Centre** for this invitation and opportunity to share some of our research and knowledge on what we regard to be an issue of critical importance to both the direction of the Australian economy and the economic opportunities and welfare of its citizens. The organisation I represent, the **Bankwest Curtin Economics Centre**, is an independent economic and social research organisation. It's located within Curtin Business School and benefits from co-funding from both Bankwest and Curtin University, but the views and the research of the centre are independent and are not to be attributed to Bankwest as an organisation.

Workforce and labour market issues are really one of the key research areas of the centre, particularly workforce and labour market issues as they play out in Western Australia as well as nationally. Over the past five years the centre has released a series of major reports relating to workforce and skills in WA, WA's economic future after the resources boom, the challenges of an ageing population to WA and nationally, income inequality and poverty, and the cost of living. All of these abound intrinsically with the future of work and the future of workers in Australia. We also publish monthly labour market updates and quarterly economic commentaries to keep on top of current labour market trends. Each of the reports, commentaries and updates is available for download on the centre's website.

Particularly of interest to us in light of this inquiry is the fact that we are currently preparing a major report specifically on the topic of the future of work. This report will be released on 13 April, so it is very timely to have the opportunity to talk with you now on some of the broad issues and thrusts of that report. It is the case that the report will be released on 13 April and hence I am to a degree limited on the extent to which I can refer directly to those reports' findings, but I think there are a number of issues we can discuss today. And, of course, as soon as the report is launched I am very happy to provide that copy to the committee for its consideration.

CHAIR: What did you say that topic of the report is?

Prof. Duncan: It is on the future of work in Australia.

CHAIR: There you go.

Senator PRATT: Can I perhaps move, Chair, that we now move to accept that as a late submission when it is available?

CHAIR: Sure.

Senator PRATT: That way we have done that bit of paperwork.

Prof. Duncan: I should also note that Curtin University is planning to make the future of work a strategic focus, and, as the year, develops that will be formalised in a range of ways.

To start with, for us its important to note that the future of work is starting now, and there are particular signals regarding the future directions of workforce and labour-market issues in WA that perhaps deviate from patterns elsewhere in Australia. A lot of these signals draw from some of the work that the centre is undertaking. It seems to me that it raises a lot of questions about the preparedness of WA and Australia for the future of work, making sure that we share in the benefits of future workforce opportunities and ensure against a more polarised situation in which we have insiders in labour markets versus those who are unable to access the benefits of new labour-market opportunities.

Do we have the right HR and IR and contractual settings to prepare for a future of work in which multiple job opportunities, portfolio approaches to employment and portfolio approaches to income earning are likely to become ever more prevalent? I also don't think that enough consideration perhaps is being given to the impact that new workforce future might have on older age generations. We are in a situation at the moment in Australia of a baby boomer wave that is going to be hitting retirement over the next five to 10 years. The baby boomer generation are a generation who are disruptive and for whom a more blended route into retirement is going to be far more the norm than the exception, rather than a binary approach, whereby at retirement age there is a complete withdrawal from labour markets. I do think that this baby boomer wave is going to be seeking fractional attachment to labour market to go alongside community engagement, participation and lifestyle choices. So where

the older cohorts of Australian workers sit in the context of future work, for me, is something that is really an important part of the conversation.

As I said, in WA there are patterns and dynamics in labour market engagement and transitions that do deviate from the national norm, and I'm quite happy to perhaps discuss some of those particular patterns as we observe them over the course of this evidence.

CHAIR: Why don't we start there?

Prof. Duncan: We are seeing a number of interesting signals in relation to the workforce dynamics in Australia, and more particularly in Western Australia. Of course, the particular context in WA is that it is coming off a really strong resources boom; the consequence of which is that over an extended period of time we had relatively high rates of employment and relatively high rates of pay. As we have moved from the construction phase to the production phase of the resources boom, and as iron ore prices in particular have come off, there has been an impact on employment, and particularly in the resources and support sectors. We have, for the first time, last year, seen unemployment rates in Western Australia rise to meet and exceed the national average for the first time in perhaps a couple of decades. Of course, the implications of that were that a volume of workers were ceasing to work in the sector of their choice and were therefore seeking new labour market opportunities.

When one looked at the data, one found that there was a pretty systematic shift or increase in the prevalence of part-time work relative to full-time work. That was the case particularly amongst mean interestingly. The pattern of work between men and women is changing in terms of the balance of hours. That is something that is a real consideration.

That said—even though the patterns of part-time and full-time employment amongst women are relatively stable—it often comes up in the analysis of our data that underemployment is far more an issue for women than men. If one looks at underemployment ratios and divides that by gender and states, the rates of underemployment amongst women in Western Australia are, alongside South Australia and Tasmania, the highest across all state jurisdictions, at around 13 per cent as a ratio. That is to say, 13 per cent of those women in work would ideally like to work more hours than they currently do.

For men, the ratio is typically in single digits, at around eight per cent. So it is systematically the case that underemployment is more of a challenge for women than men. So, when one looks at the pattern of work going into the future, one needs to put a bit of a gender lens over that element of preparatory in future employment.

CHAIR: The figure that you were just citing there—about the increase in part-time work especially for men, and underemployment—are they relatively current figures or is that what was happening during the mining boom?

Prof. Duncan: No. These are all relatively current pictures. The Bankwest Curtin Economics Centre produces a series of monthly labour market updates, and we draw from the latest available ABS data. So these are really the latest published on the ABS website.

So I think that is important context. One of the other contexts—and I think this is going to be particularly the case in WA—is that hours of work are on the decline amongst people in employment. One of the statistics that the ABS publish is a statistic on the number of hours of work per month amongst those in employment. Now, if you look at the average monthly hours per employed worker by gender, one sees that, whereas for women average monthly hours across all the jobs is relatively stable, at about 120 hours, across at least one and a half decades to the start of the millennium; when you look at monthly hours for men, systematically there has been a decline, from around 165 hours per month on average for men in 2003, down to 155 hours per month amongst men, on latest data towards the end of 2017. For us this suggests that there is something systematic and structural going on at the moment in the labour market, and it's been happening for some time—that the average number of hours of work amongst male employees is reducing. And that's not just the change in the balance of full-time and part-time work amongst men; it's also the number of hours that full-time male workers are either seeking or getting from their employers. The question then is raised about whether this foreshadows a future labour market where fewer working hours for men are the norm rather than the exception.

The last point I'll make around the composition of labour markets in WA versus other state jurisdictions is this variation and deviation of WA trends from other national trends. If you look at national trends in employment by industry, some of the strongest growth areas in terms of the percentage change in employment in the year to the end of 2017 are in construction, where employment figures rose by around 4½ per cent; in education and training, where again employment rose by around five per cent; and in accommodation, health care and manufacturing—all of these are on the positive. However, if you then drill down and look at growth areas across industry sectors in WA, the patterns are different. Whereas construction is strong in other state jurisdictions, in Western Australia

construction has been coming off and is actually one of the poorest performers in terms of change in employment. Employment over the year to the end of 2017 has been down just under six per cent over that period.

So, there's a very different composition of the labour market and therefore very different implications of labour market transitions that are present in WA. And interestingly in WA, agriculture has been quite a strong performer in terms of growth in employment. Now, that needs to be put in context. Agriculture, in generating employment opportunities in WA, sits as a very small share. I think if you look at employment in agriculture as a share of total employment in WA then really that's sitting at around three per cent. So, it's not that in absolute terms agriculture is generating the great new employment opportunities in the state, but it is the case that that's been on the rise.

But I think the idea that employment opportunities in WA are perhaps driven by a small subset of industry sectors is something that we need to challenge, not just in terms of our understanding of the labour market patterns in the state but also in terms of the policy responses to a changing labour market future in which mining, construction and the support services are no longer going to be the major drivers of future employment opportunities. It seems to me that in WA we need to also have a portfolio approach to the industrial development strategy to make sure that other industry sectors are lending a shoulder to the wheel in generating new and significant employment opportunities.

CHAIR: I was going to ask you about that. I'm from Queensland, so I might be operating under a misapprehension. But there's always been that view that the WA economy is particularly dominated by mining, even more than my home state, and that exposes it to some risks—the boom-and-bust sort of environment. I have two questions. To the extent that that remains true—that mining is and will remain a big player in the WA economy—what consequences does the growing use of or implementation of automation in the mining industry have for work in WA? We were kind of hoping to get a couple of mining companies in, but that wasn't possible. But we hear stories of so much of that work now being controlled by remote control in Perth. So, what consequences does automation have for the WA economy, particularly with mining? And to pick up on what you were just saying about the need for WA to diversify its economy, what sectors do you particularly see opportunities in?

Prof. Duncan: They're very good questions. In preparing the future of work report, one of the areas that we are looking at specifically is patterns of automation and also perceptions of automation by employees in different industry sectors. One of the sources of information that we've mined—pardon the pun—is business use of information technology, which looks at the proportion of employers for whom intelligent software systems, or AI, are of major importance. Mining features as the top industry in terms of the importance of AI to their future business development, followed by IT, telecoms and electricity. Around 15 per cent of employers regard AI systems to be of major importance to their businesses. When you then also break down the data on perceptions of importance of AI from the employer's perspective, it's clear that the larger the industry, the greater the degree of importance that AI is going to have to their future business development. If you look, for example, at businesses employing 200 or more people, around 33 per cent of those businesses regard AI to be of major importance to the future direction of that business.

There are some other intriguing patterns when one breaks those down. If you look at the major businesses by industry sector—those employing 200 or more—for mining as a particular industry sector, nearly two-thirds of businesses employing 200 people more in the mining sector regard AI to be of major importance. So I think that it is most certainly going to be a challenge in the extent to which mining in particular can continue to support employment at the levels that are currently in place. To answer your question: yes, this surely must be a threat in the more technologically advanced and AI-dense industry sectors, such as mining.

To the second question, around which sectors in WA and, indeed, perhaps elsewhere in similar states should put a bit of a shoulder to the wheel, if you will: we have talked about this at length in a report that we released in 2016 called, *Back to the future: Western Australia's economic future after the boom*, which, again, we're very happy to make available to the committee. As you would have heard from other submissions and other evidence, the service sectors are of course most certainly likely to feature more prominently in providing future employment opportunities in WA. Education and training, health care, social assistance and aged care are clearly going to be growth areas for a variety of reasons, not least of which is the changing demographic profile and the ageing profile of the population in WA. There is the baby boomer wave coming through, which will mean that in five to 10 years time we'll have a significant jump in the share of 65 to 70-year-olds, and, therefore, 20 years on we'll have a significant bump in the share of 85-year-olds who are in the state and who will be requiring those sorts of levels of health, social assistance and aged-care services.

For me, one of the sectors that perhaps has been left off the narrative around future employment—and this is not an exhaustive list, I have to say—is manufacturing, and particularly niche manufacturing that exploits the

high-knowledge economy that we have in WA and in Australia generally. It seems to me that manufacturing does not feature to the degree that it should in the narrative around future employment opportunities. We have a lot of discussion in WA about the role of accommodation, food services and tourism. Of course, these are important parts of the WA economy and will continue to employ well, but manufacturing is perhaps underdeveloped and has been underdeveloped for some time. Perhaps that's a function of the concentration of investment in mining—the so-called Dutch disease, which I think WA caught to a degree over the course of the resources boom. But, especially given the strength of our knowledge base, and the strength of our patents and innovative activity, it does seem to me that, in translating to new employment opportunities in niche high-tech manufacturing, we can better exploit that to a greater extent than we have now.

Senator REYNOLDS: Thank you very much for that. I want to pick up where you left off in terms of the options here for our manufacturing and fabrication sector. I agree with you wholeheartedly that it is something here in Western Australia we actually do very well. Up until, I think, last year, we'd been growing at about five per cent every year—exporting up to $20 billion worth of high-end manufactured goods from Western Australia. If you listen to the narrative in the Eastern States, manufacturing seems to be doom and gloom. In what sort of ways do you see that we can further promote the manufacturing capability? I think we have about 8,000 employing manufacturers here still in Western Australia. Where do you see that needs to go? Is it more awareness raising or is it more training and education? Where do see that it has been left off the national discussion?

Prof. Duncan: In terms of where manufacturing sits on the radar, I was thinking more about manufacturing in WA and the fact that, perhaps, it's been put in the shade a little bit relative to some of the other sectors that feature more prominently in the industrial development and growth strategies for the state—like tourism, agriculture, mining, construction and, more generally, resources. In terms of how we drive the development of the significant employment opportunities in those sectors, it does seem to me that there is no single silver bullet. It's a trite phrase, but it's very true in this regard. But, most certainly, there are better ways in which we can connect up innovation and the development of new IP and translate that into productive and profit-making activities which generate employment opportunities amongst the niche manufacturing sector. That's perhaps something where we've fallen a bit short. I think both the WA Chief Scientist and the federal Chief Scientist have made the similar point that if you look at the continuum between pure knowledge development and translation into productive industry opportunities, there does seem to be a bit of a gap there that needs bridging.

Senator REYNOLDS: Just on that point, would you also see a gap that needs bridging between the great work that happens here already in Western Australia in terms of innovation, manufacturing, fabrication and electronics with our universities and our large resource sector companies? While a lot of that research and the IP has been focussed on resources, do you see that there's also great potential now for exploring better ways of adapting those technologies, skill sets and people into other industries?

Prof. Duncan: There are huge opportunities. You are quite right—WA can be regarded as a national and, indeed, world leader in some of the science, the IP and the technology around those sectors.

Senator REYNOLDS: It is still very stovepiped. Might that be a future for Western Australia in terms of work—taking what we already do very well and moving it across new industries?

Prof. Duncan: Yes. I agree. In doing so, I think that then opens up opportunities for employees—especially employees at a higher skill level—to make the shift and transition from one industry sector to another.

One of the other areas of development that I think is really critical in WA is to make sure that we have the right settings in our education—the right settings in terms of vocational education training and retraining, to ensure that as people are shifted out of their current sector there are ways of them being able to move productively into other sectors and to be attractive to employers in other sectors. But, not to deviate too much from the point you're making, I definitely think that there are opportunities for disseminating and sharing the innovations across industry sectors. Now, where that sits in relation to commercial IP is clearly a question that I can't provide strong answers to.

Another related area of development that has been discussed at the federal level for some time now is the smart specialisation strategies, where one can exploit existing comparative advantages in both industry strengths and technological advancement and then seek to build around those areas of existing strength at a local level to allow local labour markets to grow and benefit from what's already there—the existing endowment, if you like—but which can then perhaps look to generate a greater share of additional employment opportunities than is currently the case.

Senator REYNOLDS: That's actually a very good thought. I haven't seen that smart specialisation strategy. When you have a look at Western Australia, one of the things we're very good at is megaprojects and all of the

skill sets that go into that. It's not just manufacturing and fabrication; it's all the professions, the supply chain, the logistics, the legals and everything that goes around that. Is that part of it—that there are opportunities to take up in those service sectors but to put them into new industries or into new offerings?

Prof. Duncan: It's all part of that broader picture. The population is growing; the number of labour market participants is ever on the rise. The Australian labour market needs to at least walk at a fast pace—and possibly to run—to keep still, because it's ever the case that more and more employment will be required to meet the aspirations of a rising population of labour market participants who are either in work or who, more particularly, are seeking work. In order for that to be achieved, I think that some degree of coordination and collaboration, and a sense in which one can share in the absolute priority to create new employment opportunities are really imperative.

Senator REYNOLDS: So what you're saying is that we really need to have a pathway looking forward and to have a more defined pathway so that we can keep adapting our workforce and providing the opportunities for the future, not training them for the past?

Prof. Duncan: We do. And I think that that pathway needs to involve a greater degree of collaboration or integration, or at least a sharing of insights and capability.

Senator REYNOLDS: Thank you.

Senator PATRICK: This is a context-setting question. Are you familiar with Singapore's Economic Development Board?

Prof. Duncan: Not in great depth, I will confess.

Senator PATRICK: Across a number of witnesses, there seems to have been evidence of the lack of a direction-setter and someone coordinating the activity. Your testimony reminded me of a visit I made to the Economic Development Board in Singapore. One of the roles of Singapore's Economic Development Board is to make sure, for example, that every sector is getting kicked along rather than letting the market drive the direction purely on an opportunity basis. Maybe it's something to take on notice through your study—to have a look at how they've coordinated their activities to get successful outcomes for Singapore. It's a country the size of the ACT, with one-third of our GDP. Maybe that's all I need to say; maybe have a look at that.

Prof. Duncan: It's a very helpful suggestion; thank you, we will. And I think it does resonate there, the capacity to which coordination can, perhaps, lead to improved or more efficient outcomes.

Senator PATRICK: And I'm talking at a national level. We seem to be lacking that. Maybe that's an opportunity for you to feed that back into the committee, knowing that we're accepting your report as a submission.

Senator PRATT: You mentioned Dutch disease in your remarks today, and I'm wondering if you might have any commentary on the extent to which government levers can help us avoid it? You certainly saw and felt it happening here in WA. I think the response from the mining industry, at the time, was, 'No, we won't let that happen,' all the time, while I think they very well knew that that's what they were doing to the rest of the economy. Is that danger over and what do we need to do to avoid it in the future, particularly if we're going to make something like manufacturing a core plank of our economy, here, which it clearly already is, but did suffer, to a significant extent, because of the transferral and hollowing out of skills in that boom-bust cycle?

Prof. Duncan: I think that in terms of an overarching development strategy—which perhaps, at the very least, monitors and, where appropriate, either supports or incentivises investment in areas of potential rather than in areas where the benefits and returns are here and now—that eye to the future, and this has been raised, I think, by the members of the committee, is a really important part of any strategy. Dutch disease is, essentially, that. It says that—almost making hay while the sun shines—if the opportunities are there, present and now, then the concentration and devotion of resources into that opportunity for growth, the incentives to do so, are really hard to resist. But I think one does, to a degree, need to resist that and have a portfolio approach to development.

Senator PRATT: For example, Western Australia's shipbuilding and those kinds of industries, which fought quite hard to stay competitive during the mining boom, are now really looking to try and forge ahead and grow. Are they the kinds of industries you might be looking to?

Prof. Duncan: I think, inevitably, WA has a range of strengths of which strengths in those sectors would be one. One needs, obviously, to direct and use resources and incentives as efficiently as possible. I think the breadth of manufacturing, from heavy through light to high-tech manufacturing, all of these, can form part of an integrated investment in development strategy for the state.

Senator PRATT: In terms of your research in this space and staying on top of future work and where government gets its advice about that in the future, how well placed are our institutions, nationally, to inform government and to work with industry on those questions as they continue to emerge? Staying on top of those issues and getting advice on those issues should be a question, I think, before this committee.

Prof. Duncan: Yes. And by institutions you mean—

Senator PRATT: Things like your own organisation and how well we're listening—government and perhaps industry, unions and other organisations—and considering these issues to stay on top of responding to those trends.

Prof. Duncan: I can speak only for my time at the Bankwest Curtin Economics Centre and, formerly, my time working for a similar research institute in Canberra. I've found that access to state and federal government Public Service departments in cognate portfolios has been good and we've been able to forge very productive relationships to communicate the results of our research. I think there's actually a responsibility also on research centres, such as mine, to be proactive in communicating and engaging on the back of this original research. That's something that we take very seriously at the centre. We commit very strongly to engagement campaigns around all of our major reports, and we've found that to be very, very effective. The important thing there is to not drop the ball in the continued engagement around research such as that which is produced by the centre.

Senator STEELE-JOHN: Could you give me an idea of trends you've observed in relation to the employment of young people within WA, and whether you've seen a similar kind of divergence from the WA experience to that which is being experienced nationally?

Prof. Duncan: Thanks very much for the question. It's most certainly the case that unemployment amongst younger age cohorts—there are some quite significant variations across state jurisdictions, and also within WA significant variations across some of the regions that we see. On relatively recent figures for youth unemployment, WA has an unemployment rate amongst 18- to 24-year-olds of around 13 per cent, which significantly exceeds the national average. In terms of how that ranks, WA's youth unemployment rate is exceeded only by South Australia's and Tasmania's, and pretty much matches Victoria's youth unemployment rate.

It clearly is a challenge, and creating opportunities for employment amongst younger age cohorts—those that are coming out of education: straight out of high school or VET or higher education institutions—is actually a critical part of the growth trajectory. One of the things that we looked at, and will be reporting on as part of our research on the future of work, was the share of individuals in different age cohorts for whom there have been more frequent changes in their employer over a short period. What we're finding is that the number of transitions within employment over the last years is significantly greater for those in the youngest age cohorts, compared with the older age cohorts. If we look at people who are continually employed over the last five years amongst the male population, then on average for the youngest age cohort of 18 to 24 there will be at least one and possibly two transitions of employer over that five-year period. When you looked at the older age cohorts, those transitions across employers tend to really settle down. That's the same whether you look at youths in WA or youths in other state jurisdictions.

Similarly for women, you find that the youngest women aged 18 to 24, who have been in a period of continuous employment, will have exhibited a far greater rate of change of employer compared with older cohorts. I think that's an important new piece of information that our report is going to develop around employer transitions and what implications they have for our settings around employee training or retraining, in our settings around job placements activities and the ownership of that responsibility.

Senator STEELE-JOHN: That is a feature of the labour market generally, that increased level of transition between employees. And what we have heard in previous hearings is that there is nowhere near the emphasis on transferable training that there once was in the employment market, leaving people who have participated in an industry for decades with no actual transferable qualifications from that experience. Will your report be covering ways in which we can improve that moving forward?

Prof. Duncan: It will. It's one of the focus areas of the report: the role that education, the higher education sector and the vocational education sector have in developing skills, adaptable skills, to futureproof workers against the changes in skills requirements from employers. We are seeing it to a degree already, and for some institutions more than others—that is, a more comprehensive education product whereby one is not perhaps just teaching science; one might be teaching science with attendant business skills and skills that might accommodate individuals considering a shift towards self-employment. Again, there is the complexity and multiplicity of skills required if one is making that shift from the formal to the self-employed sector. But I think what is really

important is that the education sector is really integrated with industry in terms of what industry requires, and the skill sets that are likely to be in greater demand into the future as we see the increasing shift towards AI and the reduced demand on the lowest skill sets.

Senator STEELE-JOHN: But also that employers proactively provide their employees with the opportunity to take up those educational opportunities that would be developed.

Prof. Duncan: Again, I think your point is extremely well made. One of the questions that we've posed, and this will again feature in our report, is the extent to which employers share in the obligation around facilitating transitions of employees that are moving from their business or their industry to another. At the moment, the greatest concentration or the greatest focus of the obligation is on the individual, and perhaps on government. But especially given the data that we've seen on an increased prevalence of transition across employers amongst younger age cohorts, I do reflect on whether or not employers have a greater role to play in easing this transition.

Senator STEELE-JOHN: As do I.

Senator SIEWERT: That's going to become less transparent. As we're looking at the gig economy and the way that we're de facto deregulating, who is the employer is increasingly going to be the question.

Prof. Duncan: The labour market of the future, from the perspective of the worker, is going to be complex. All of these sorts of settings around responsibility in HR, in training, the contractual complexities of individuals who may share employment across two or more employers—something which is relatively rare now, but potentially could increase in prevalence into the future—are perhaps not mature enough to accommodate this increased complexity of workers' exposure to the labour market.

Senator SIEWERT: I've got questions about young people, but I might put them on notice. I want to go to older workers now. You started by saying, 'The future is now'. We've got a whole lot of older workers who are—I heard on the weekend about how somebody had been working for a company for an extremely long time, and just before Christmas they were told, 'Bye'. Older workers are finding it very difficult to regain employment. There's age discrimination. They may not have formal qualifications, but they've got a list of experience as long as your arm. You also articulated the wave of baby boomers that are going through what you called 'fractional attachment with the labour market'—in other words, they'd be going part time. I presume that's what you meant.

Prof. Duncan: I was thinking a blended retirement.

Senator SIEWERT: My concern is you're going to see these workers just drop out—we're seeing it already. They're already on Newstart for anything between five and eight years, before they go on to the aged pension. I'm very concerned that we're going to be seeing that in the future. When we're looking at the future of work, we're looking at young people, as I think we need to be, but we've also got a huge cohort that are going to be living in poverty if we don't do something now about the future of their work.

Prof. Duncan: I'm glad that you picked up that part of my introductory comments, because I do think it's something that is important and perhaps unconsidered: the future of the older worker in Australia. It's a hugely experienced cohort with tremendous productive capabilities and tremendous skills in mentoring and developing younger cohorts coming through. I think it would create a whole host of issues, both economically and socially, if we don't prepare the future workplace to accept fractionally employed older workers as part of the overall employer workforce. I'm optimistic that businesses, themselves, will see the great opportunities and the great benefits of older workers.

Senator SIEWERT: You're more optimistic than me. I'm not seeing it at the moment.

Prof. Duncan: I'm optimistic that they will, but perhaps there needs to be some more formal and conscious recognition. One should increase the rights or the opportunities that they have to engage in active but fractional labour market opportunities running into retirement. Of course, we have discrimination legislation in place that relates to other characteristics, but I think age is perhaps something which should be featured more strongly than it does in that.

Senator SIEWERT: Can I ask a supplementary question? In terms of my previous question about the role of employers and how we won't have one employer, your answer said, 'Well, there might be a number.' It's same with older workers, and it seems to me, if you've got a range of employers, there's not a lot requiring them to cooperate together because they're individual businesses. Is there a role for government or some sort of underpinning legislation to put a regulatory base underneath requiring people to cooperate or ensuring that people are going to be able to access the types of transitional training to better support people transitioning out of the workforce to do part-time work? Is there a role for requiring that?

Prof. Duncan: On whether or not there's a role for requiring that, I think I'd need to think a little bit more—

Senator SIEWERT: How do we do that? The question is probably: how do we facilitate what you're talking about?

Prof. Duncan: Clearly, the individual is somebody for whom the knowledge base of a particular employer is restricted to the period of their engagement with that workplace. Your question is more around whether or not, for those who may be shared across multiple employers, employers have an obligation to connect in order to ensure that that worker is adequately protected. I have sympathy with that sentiment. I know that the regulatory framework, as with other frameworks, perhaps is underdeveloped for these sorts of circumstances currently, but I think it's really critical that we reflect on that sort of regulatory base on which workers with multiple engagements across employers can be protected. It's hard for me to think very strongly about a precise mechanism at this point, but we're very happy to think further about that and take it on notice.

Senator SIEWERT: Yes, that would be really appreciated.

CHAIR: Thanks very much. As you can see, there's a lot of interest in your research, so we look forward to seeing your report once it's publicly released.

Prof. Duncan: Thanks very much for your time and your interest.

CHAIR: We will break for lunch now.

Proceedings suspended from 12:29 to 13:09

DYMOND, Dr Tim, Organising and Strategic Research Officer, Unions WA

HAMMAT, Ms Meredith, Secretary, Unions WA

McCARTNEY, Mr Steve, Western Australian State Secretary, Australian Manufacturing Workers' Union

ACTING CHAIR (Senator Patrick): Welcome. I declare the hearing reopened. I understand that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you.

Ms Hammat: That's right.

ACTING CHAIR: I now invite you to make a short opening statement, and, at the conclusion of your remarks, I will invite members of the committee to ask questions.

Ms Hammat: I will make a few opening comments, and our colleague Steve McCartney will also be able to elaborate on the themes. Can I start by thanking the committee for the opportunity to appear today to discuss what is a really important topic. Unions WA is the peak governing body of the trade union movement in Western Australia and is the Western Australian branch of the ACTU. As a peak body, we are dedicated to strengthening WA unions through cooperation and coordination on campaigning and common industrial matters. Unions WA represents about 30 affiliate unions and, in turn, represents about 140,000 working Western Australians. We appear today to support the submission of the ACTU to this inquiry and, in particular, their comments that the focus of the debate about the future of work should be on how to manage the digital revolution to ensure Australia's growing inequality and insecure work crisis can be reversed, not exacerbated, through the opportunities that are provided by technological change.

We think that addressing inequality and insecure work is a crucial part of taking the high road to productivity in which long-term efficiency gains are delivered through innovation and skills in a knowledge based and high-waged economy. The alternative is more of the same policy settings that set us on a low road of cost cutting, lay-offs and cuts to working conditions. Unfortunately, without some clear thinking, many of the policy settings we have at the moment seem intent on taking us down a low road, particularly when they come in the form of attacks on what are often referred to as labour market rigidities or the need for labour market deregulation. It is our view that often what is called labour market deregulation is in fact reregulating it in favour of employers. It is often associated with removing collective worker protections such as award conditions and the institution of individualist arrangements, which shift the power in the employment arrangement away from the employee to the employer.

The current situation is one where we have increasing inequality in this country. Millions of people in Australia cannot find enough work and some of them can find no job at all. Unemployment continues to increase and a large number of young people struggle to find the work that they need. More and more Australians are in insecure work, where they are juggling multiple contracts, whether they are casual jobs, temporary jobs or referred to as freelance jobs. Approximately 40 per cent of workers in Australia now experience at least one dimension of precarity in their work. Employers are increasingly using non-standard forms of employment as a way to avoid their employment obligations. It is worth noting that, during the recent employment boom in Western Australia, the wealth that was created didn't trickle down. During that period, WA had the distinction of being the most

unequal state in Australia, according to the Gini coefficient. Even after the boom, WA has managed to stay either first or second in terms of inequality.

We also retain the distinction of having the largest gender pay gap of any state or territory in Australia. Although there has been a slight improvement as the mining boom has finished, the reality is that that is largely down to men moving into less secure working arrangements rather than women workers becoming more secure or better paid. Also, recently released ABS data comparing the wages of men and women in casual work where people receive no annual leave or sick leave showed that there are an increasing number of working Western Australians in some form of insecure or casual work—271,000 of them.

So, creating wealth alone is not enough to ensure that the living standards of all Australians are improved. I think the recent experience in WA demonstrates how wealth can be generated but that if we don't have the proper policy settings in place to make sure that it is shared it can in fact lead to increasing inequality in our economy. The other thing worth noting is that the recently released ABS statistics show that women working in jobs without paid leave entitlements were receiving less pay than men, and although their wages had increased over the period, wages for men had gone from $800 per week in 2014 down to a new low of $624 per week just in 2017. So a consideration of the future of work and workers needs to address insecure work and low incomes. As I said, it's not enough just to create wealth; how it's shared is what matters.

Like many others, we are also interested in the gig economy. I think many have a bit of a utopian view about what a sharing economy might mean for the future of work. Our view is that the informal work practices of the gig economy are simply widening existing cracks in our system of labour regulation. Many are currently struggling with how to regulate this new form of work and how to respond to services being provided by large multinational corporations who are part of the sharing economy.

While this type of arrangement has been justified as being entrepreneurial, our view is that, in practice, it is really just a relabelling of 'employment' as 'sharing'. So by becoming sharers of an asset—in this case, labour—rather than sellers, which would make them employees, workers are excluded from many of the protections of industrial law. This has far-reaching implications for those workers and for society and the economy more broadly.

I refer the committee to Jim Stanford's work. He is the economist and director of the Centre for Future Work. He recently published an article in which he said that, while the gig economy is often portrayed as an exciting innovation, the work practices embodied in digital platforms are often longstanding. In many cases, they have been utilised by employers for hundreds of years. Home work, on-call labour, piecework compensation and the use of labour hire have been longstanding features of the labour market. While digital apps might coordinate this work in a new way, the precarious nature of the employment relationship is a longstanding and thorny old problem.

The other point we would make about the gig economy is that the technology has so far not substantially changed the core nature of work. In the case of Uber, passengers are still driven about in a car and takeaway food is still delivered. What technology has facilitated is big changes in how work is hired, supervised and compensated; it hasn't fundamentally changed work itself. It has been fundamental, though, in shifting the risk from the businesses themselves to those performing the work, and minimising their labour costs.

I would point the committee to a recent example. In 2017, a Perth Uber Eats driver was left unable to work after he was injured in a hit-and-run accident in Northbridge. An online fundraiser set up for him raised more than $5,000 in 24 hours. While that is a heartwarming story about a community response, it really underlines the lack of occupational health and safety and workers compensation provisions for workers in the gig economy and how it engineers a shift in risk from an employer taking out workers compensation insurance to the individual—and, in this case, the individual not having any safety protection at all.

It is our view that, without deliberate and conscious decisions by government, it will increasingly be the case that the public purse, in the form of taxpayers' money, will be paying for the liabilities of the gig economy. In short, workers will still get injured at work and they will still retire and need some form of income to support them during those years. But if the policy settings for workers compensation and superannuation become ineffective as full-time work becomes increasingly less common then it is ultimately government and the public purse that will bear the cost of that shift.

The ACTU in their submission also make the point—and I know it has been made by others this morning—about policy settings supporting skills development and the need to ensure that we have in place good settings that recognise the need to train young workers taking up positions and entering the labour market, that recognise that

workers will need training and retraining during their lifetimes and that don't allow employers to subvert any responsibility for that.

There are two other points I would like to make before I hand over to my colleague. Firstly, I would draw the committee's attention to the recent Langoulant report—the special inquiry that the Western Australian government commissioned into Western Australian government programs and projects. Its purpose was to look at governance arrangements and decision-making in the context of the state government, but the report also highlighted questions about the future of payroll tax revenue. Payroll tax is assessed on the wages paid by an employer. It is important source of state revenue in Western Australia and other states around the country as well. The point the report made was that the high growth of part-time and casual jobs—and, indeed, jobs that are not considered to be employment in the traditional sense—really does call into question some structural risks about payroll tax as an ongoing form of state government revenue. It might be of interest for the committee to consider the wideranging ramifications not only for individuals but for the state as well.

Finally, I want to reiterate that I think it is important to consider the future of work with a gender lens as well. Western Australia has the biggest gender pay gap of any state or territory in Australia. Australia has a very gender segregated workforce—and that manifests itself in different ways in different industries. I think it is pertinent to consider how those ramifications will be borne. I believe there are potential ramifications for the position of women in particular. I am happy to elaborate on that, but first I will give my colleague a chance to make some submissions.

Mr McCartney: On behalf of the AMWU, I thank you for the opportunity to have a talk with you today about this. I will not repeat our national submission chapter and verse. I do not think that is necessary. It is a good submission and I support it. But I would like to give you the Western Australian position on this. We have given this some serious thought over the last few months as a group and working with our industry councils, which are mainly in the areas of mining, defence, shipping and trains. As you know, we also have a fair few white-collar members in our union.

We also want to talk to you about software design and innovation, and how we believe that we need to connect to get a real manufacturing outcome. I want to bring your minds to the fact that we are manufacturers and we look after people who manufacture products. Innovation and design have been a part of manufacturing ever since there has been manufacturing, so we are quite aware of and comfortable with innovation and design. But one thing were not comfortable with is the lack of support and training, and where it starts and stops. We believe we need to have a strong connection between manufacturing, innovation and design. That means connecting universities and TAFE to the design centres, with support around research and development.

I am old enough to be a creature of the eighties. Working in mining, I saw how much action and work was centred around research and development in the eighties. When the federal government gave that incentive around research and development in the eighties, mining and other companies that look for innovation all the time grabbed it with both hands and created a lot of work around Australia. Disappointingly, a lot of that design, engineering and intelligence went offshore and didn't turn into Australian based manufacturing. Solar panels are a classic example of that.

We believe there is an opportunity now. In our view, Western Australia has a unique position in that we have nearly all the dimensions of the future involved in where we are right now. We service the mining industry and oil and gas. We also look after the auto industry—a lot less so now than we did in the past, because we don't get the opportunity to design and build our vehicles here anymore. With automatic trucks in mining, there's the automation of what we are doing in every facet of our work in the future. If we don't enhance that and use this an opportunity as a great testing ground in Western Australia, it's an opportunity lost. That's because we have got the companies over here and we have got the industries over here that are already working in this space. I would say we are about eight to 10 years behind in some of these things in this space, so we are not going to reinvent it.

What we have to do is start working out cleaner, greener and smarter ways of doing this stuff. The only way we're going to actually do that is by promoting education. The only way we're going to promote that education, to be honest, and the only way we have gotten business on board in the past has been by getting business to support R&D by giving them some sort of reward. I've never been keen on giving businesses rewards, but I think it is going to be to the long-term benefit for everyone if we do have some support for research and development. May I suggest that when we do it this time, if we going to give them the opportunity to develop and design things in Australia, we also have to have a precursor that they might have to build some of the stuff here as well. That's because we don't want to be in a position where multinational companies use Western Australia for their research and design and then go to build it in Asia somewhere and we miss out on the good work that we have all contributed to.

We believe that's way to get long-term, full-time jobs in Western Australia. We don't think Airtasker is going to come in and take over Rio Tinto overnight. We don't see Airtasker or one of those new gigs—whatever they are called—having any real impact on our manufacturing hub where we work, in our space where we work. We do know it's going to be a big problem for government later on, because I don't know how these people on Airtasker and everything get superannuation and real conditions. I do know that if we support R&D in Western Australia, we can link these together to build real hubs of design engineering. We've got an opportunity in our northern suburbs of Western Australia and our north-west to have a hub where we can build this design and engineering, similar to what was probably envisaged in Bentley. We can back it up with TAFE and TAFE education so that when our apprentices come through their apprenticeships, they are armed with this stuff that brings them into the digital economy.

That comes into my next bit, which is about making sure that we arm TAFE and universities with the equipment and the tools to do this work. We believe the underfunding of TAFE and some universities in this space needs to really be looked at and addressed so that we can make sure that we have actually got the bits in place for our new people. That's so that when they do enter this growing and ever-changing economy they've got the actual tools to take with them. Apprentices need to come out their apprenticeships now days with these tools. When I left my apprenticeship, there were a few courses that you did at TAFE to sort your pneumatics and hydraulics out and give you a bit of extra expertise. We have to have a real solid look and an understanding about what are the skills or tools we are going to have to give our apprentices into the future to make sure that they land somewhere in the economy where they can actually be proactive and go forward. Companies now virtually want their kids to come out of high school with their training ready to go on the job. That's not going to happen as part of the future, but we do have to have a straight and a sensible way of looking at vocational education to introduce them into that work.

It's a three stage thing, I think, as far as education is concerned. Stage one is having a good gateway into it, and that's the vocational education program inside of schools. We have to look at how we do that and how we excite people into getting into that industry. Stage two is how do we have the backup in TAFE and post-trade studies to give opportunities to tradesmen who are already in place but also those people in the future as the future develops. Nobody really knows where the future is going to start or stop. Stage three is we need to give them the tools to be able to handle that change can deal with that innovation in the future. It is absolutely vital as far as we are concerned.

Without pushing my point too much further, I just really want to say that in Western Australia we should be really studying the stuff where we're already in that space now. We should be looking at how we can support innovation and design through TAFE and university. We should work out a way to support business with research and design to make sure that they can get support for research and development, because it's their support for research and development that's going to give the opportunity to do it and to get it done. If you look at the last experiment that we all went through, when we were the two industrialised countries that decided not to support innovation and design by government through companies and decided to let companies invest in themselves, it fell flat. We don't want to let that happen again. We believe that the government should take a forward-thinking role and look at what we can do to invest in our future instead of expecting industry to invest in our future. Last time we expected industry to put all that extra innovation in, they did it in another country.

CHAIR: Thanks very much for both of your presentations. Ms Hammat, I'm sorry to have missed the first few minutes of yours. I had a call back from the office I had to deal with.

Ms Hammat: It's quite all right.

CHAIR: Senator Reynolds just indicated that she was in agreement with the AMWU, so I thought I should throw to her and get that on the record really quickly!

Senator REYNOLDS: Thanks you very much, Mr McCartney. I seem to recall this is probably not the first time that I have actually agreed with some of your suggestions for the future of work. I was in fact in thunderous agreement with much of what you said. I think there is a great deal of opportunity here in Western Australia to take the approach you are talking about: for us to work together and leverage off the great work we do in manufacturing and fabrication, but at that smart end of technology. Yes, I will acknowledge that, Chair.

In a practical sense, given we have got defence industry opportunities now opening up and space industry opportunities coming up, how do we get people—whether it's state government, federal government, unions or employers—to start looking at what different ways we can leverage off the great skill sets we have here in those industries and take them across, adapt them to new sectors and train them for it? In a practical sense, how could we go about doing that?

Mr McCartney: We had a discussion about this with our industry councils. This is where I got some of this from. Where can we do our best into the future in the industries? We had 'space' listed up on the whiteboard. Everyone gave that a little bit of a giggle until last Sunday, I suspect. When you look into it and research where all this work is, you look at most of the work: of the 11 companies in the space of aerospace, there is about nine of those agencies working out of Queensland. I took a national approach to looking at what we could do and what other places could do. To be perfectly honest, the reason we picked the areas that we picked of work here is because we are actually working in that space and because design and engineering is going already on in that space.

The things that are lacking are the things that I mentioned before about how we need to catch up in that space. We think that it's going to leap ahead at an even faster rate than what it has done in the past as we get more technologically sound over here. We are talking about automatic trucks, automatic diggers and automatic cycles. Maintenance programs are getting worked out inside of that. It's all software design and it's going to be wanted to be modified more and more. We need more and more people with blue-collar work to be able to do that work. We have to extend the skills of our tradesmen, because we don't want to reinvent a new trade. Some of it is already there. The incentive for companies to do that is in the hands of the government. I believe that companies only think of one thing and that's money. If you give them some more to do it, then they might.

Senator REYNOLDS: From what you're describing and from what I've seen here, we're almost looking at a sort of hybrid sector: taking our great blue-collar tradesmen and tradeswomen and providing them with some more skills that may typically have been available at universities, like electronic engineering and software engineering, to actual combine both. Is that the sort of thing you're saying?

Mr McCartney: I'm saying that we should be able to provide better and clearer pathways for our tradesmen to go that way. Our younger people coming through need to see where they're going to end up. If we draw the line at tradesmen and then say, 'We'll teach you a bit of hydraulics and pneumatics at the end,' we're not going to get the tradesmen we need for the 21st century. That's why I think we need to be able to extend their TAFE, and they could possibly go on to university through TAFE if some want a degree like that, and back that up with the people who go to uni and who want to work wholly and solely in that space. I think it's a combination of the two. At the very least, at the other end of that, we would have tradesmen who understand software and how it works.

Senator PRATT: I want to pick up on Unions WA's response to the Minerals Council of Australia's submission to this inquiry. You've highlighted concerns about the greater flexibility they propose in FIFO roster arrangements. There has been a great deal of change in the use of FIFO labour in the state over recent decades. I'd like to know from both of you where you think that's headed. What needs to happen to make FIFO arrangements more suitable for people's family, health and wellbeing?

Ms Hammat: It's a really good question and quite pertinent in Western Australia, where large numbers of people work on a FIFO roster. I'll make a few comments and I'm sure Steve will want to comment as well, because many of his members are working on those kinds of rosters. Our concern is that many of those rosters have a considerable impact on not just those workers but their families as well. They contribute to stress, they contribute to mental health issues. The circumstances people are living in when they're on site are such that they don't often have access to what others might consider to be their normal support networks to help mitigate those stresses and pressures of life.

There has certainly been a lot of work done in Western Australia which has identified that the mental health ramifications from FIFO rosters can't be ignored. There are legitimate safety issues about those work patterns. Part of that is having shorter rosters where people are away for shorter periods of time. It is completely intuitive to understand that the longer you're away from home, your family and your surrounds—away working very long hours often without any breaks at all—is going to have an impact. We note the state government's work to introduce a code of practice. There is a draft available, though we think it needs more work. These are things that will assist with that, but I think there needs to be a recognition that workers aren't machines—we're people—and so those work rosters and how work is conducted have a large bearing on a whole range of lifestyle factors. Critically with FIFO work you are seeing the mental health ramifications which are significant. There have been some notable suicides. You might want to comment more specifically about your members, Steve.

Mr McCartney: Expectations. When I started in 1982 there used to be 16 weeks on, one week off, 12 hours a day, seven days a week. There were nine telephones and 1500 men. There were three toilets and three showers per 24 block. So things have progressed as far as R&R and accommodation are concerned, but expectations haven't been met. When I went in 1982, there was little or no chance of communicating with anyone and everyone knew that when they left, but now we live in an age where you can read your kid a bedtime story if your boss supplies the right amount of bandwidth. What clearly came out of the FIFO discussions that we've had in this state was

that you have to increase the ability for people to communicate when they're away from their families. There's a line of thought that companies have tried out, which is an American idea about minimalizing trouble on the job. It's about making people from the state they live in not work in the place they're living. So, it's easier for me, as a construction worker, to get a job in Queensland than it is in the north of Western Australia, because they know that I'm not going to fight for Queensland. It's been an effective strategy so far.

We need shorter time away from the family and we need better communication, but, more importantly we need support on the job for mental health. The reason people are killing themselves in their rooms—in our belief and understanding—is two things. Firstly, they don't build a relationship with their neighbour, because companies want to make sure that you're completely wrong-footed when you're on the job. So they don't let you have the same neighbour you had last year or last week. When I was in those camps for 16 to 18 weeks at a time, we didn't have motelling. The thing that helped me get through a lot of things in the time when I was up there was the fact that we built a little, semi-community out of the 24 people who used to live together. We used to be able to support each other. But if you keep mixing those crews up you don't get to build that level of secondary support that you really need.

The other thing is a return to work if you do have a mental issue. One of the things that came out of our FIFO inquiry—out of the survey we sent out to members—was that 67 per cent of the people who filled in the comments section, which was for unsolicited answers, didn't take their medication for antidepression or antianxiety while they were at work. That compounds the problem, by the way. The reason they don't take their medication is not because it's a banned drug and not because it's illegal; it's because if you say that on your paperwork it's perceived that you have a problem. What they don't want to have is a problem. So you get engineered out. They've seen too many of their friends get a window seat on the plane for being honest.

If we had a return to work, similar to workers comp, to work with mental health issues, we would have a lot more people prepared to put their hand up on the job to say: 'I've got a problem. I need some help.' I can tell you this from experience, if I can take one sentence out of the north-west, it's, 'Toughen up, princess.' If you've got a problem, the first thing they say to you is: 'It's a workplace, not a jail. So toughen up princess, or get out.' That's the support you will get from your fellow worker. None of these people are trained. All of these people come from different areas. Once you get on that plane and get off at the other end, you are six foot tall and bullet proof—allegedly. That persona and that mentality have to change on that job. Only companies can do that. The only way we're going to get people to confess that they've got a mental issue on the job is to have a similar understanding—if they can convince a doctor that they can return to work, it shouldn't impact on their way of working.

The reason people get so depressed when all this stuff goes down is that they've just lost their family and the only thing they've got left is their job. If they lose that—because they've lost their family—they've lost everything. The sad bit is they go back to their empty room, with the people they can't talk to anymore, and that problem amplifies. They haven't got support on site—they don't trust company EAPs, I can tell you that. They all believe the EAP is going to dob them in to the company, because they company pays them. What they need is something standalone—a peer-type arrangement similar to MATES in construction. I think that model works well. What that goes is give you someone you can talk to on site. If that peer-support person then thinks you need that extra help, they can take you somewhere else and connect you to someone. It's done on a peer-to-peer level, so you take that management persona away from it.

What we really need to do—the thing that companies could do to fix this—is stop motelling, make sure they have good communication, look at their R and R, and, more importantly, give them a return to work if they have got a mental health problem. I can guarantee you there are plenty of bosses out there with anxiety and anti-depression tablets. I know; I've talked to them all. But our members are too scared to put it down. We can get rid of the fear by saying: 'Don't be scared. We won't touch you,' but I don't think they're going to believe that. I think the only thing they're going to believe is if they've got a return to work on the same grounds a workers comp.

Senator PATRICK: Just to follow up on the conversation you were having about FIFO: I recall that when Western Mining set up Roxby Downs they spent money building a township, which BHP didn't pay as much attention to when they moved in. But now, and from recent conversations I've had with them there, they're suggesting that they're going to go back to in-sourcing and working with that arrangement. Is that the sort of thing that's happening in Western Australia? Or is—

Mr McCartney: I think the mines are talking about it. I think that the mines learned their lesson when they built towns in the sixties and had to manage towns. They handed over everything—Newman is a classic example. They handed Newman back over to Newman and then took all the money out of Newman, because they believed

that they were miners and not social workers. That was what happened in the sixties. In the sixties we built them and in the nineties we pulled them apart, if you remember rightly.

I was in the first FIFO job in Western Australia, which was the Argyle diamond mine. That was the experiment and everyone did it. When we had the experiment at the Argyle diamond mine it was a completely different experiment, where people worked two weeks on and two weeks off. They had a better lifestyle, better communication and a real avenue to go to the boss with a problem of mental health.

Senator PATRICK: I'm just trying to follow you: are you suggesting that they're going away from FIFO? Where are they heading?

Mr McCartney: No, I'm suggesting that they are talking about going away from FIFO and employing locally, but doing nothing locally to promote that employment.

Senator PATRICK: Okay, thank you. The second line of questioning I have for you is that you've talked about these innovation hubs where you combine academia with industry and entrepreneurs of some sort.

Mr McCartney: Yes.

Senator PATRICK: There is a saying from my Navy background, 'If you can't point at the one person in charge then no-one is in charge.'

Mr McCartney: Yes.

Senator PATRICK: Who is in charge of that and making sure that it's working?

Mr McCartney: I reckon it's the Minister for Jobs and Innovation.

Senator PATRICK: Is that what's actually happening, or is it—

Mr McCartney: If I were dishing out the work, that's who'd get it—

Senator PATRICK: But who do you think is—

Mr McCartney: Ultimately, they carry the baby.

Senator PATRICK: But who do you think is doing it now?

Mr McCartney: No-one. That's why we're saying it. We need to do it.

Ms Hammat: I think it's an argument for having a proper policy that recognises these sorts of innovations won't just happen if they're left to the free market. They do need coordination and driving, and they need someone with a sense of vision. It would seem that that is appropriately within the government's quarter.

Mr McCartney: Defence do that pretty well with universities.

Senator PATRICK: Sure.

Mr McCartney: And, going back to the discussion around winning the work from resource development companies over here, we talked about building those hubs and backing them up with TAFE and universities, because otherwise we're not going to get there. It's the same as innovation.

Senator PATRICK: Thank you.

Senator STEELE-JOHN: I'm not sure who this will be best directed at, so whoever has something come into their head can just fire off! We've heard a lot about the way in which the trajectory of work will see an increase in employment transitions throughout the employment lifespan, if you like, and a subsequent need for more transferable training where it is actually the responsibility of the employer to ensure that the employee is able to access and to participate in that. I'm wondering if you have any thoughts around the way in which work is changing and the way in which employers might retake on that role of ensuring that their workforce is trained in a way which is transferable?

Ms Hammat: Yes. Could I have a go at that? Steve might want to add to it. I think that the history of training in more recent years has in fact been employers shifting all of those obligations further away from them. Apprenticeships bear that out, I think. You don't have to go back that far to when an apprenticeship model was about employers taking on young people and skilling them with skills that wouldn't just serve them in that employment context but would actually serve the economy and that individual throughout their working lives. I think that the decline in apprenticeships in the private sector tells a story showing that employers don't bear that responsibility. Your point is a really good one, in that there will be increasing transitions. All the commentary supports the idea that those transitions will need to be accompanied with reskilling as people move from industries in decline through to new industries. I think there are significant challenges in getting employers to accept that responsibility. I don't think it will happen unless there are some incentives—perhaps carrots and/or sticks might be the way to phrase that. But it won't happen on its own. It will require policy settings to support it.

I think it is also worth making a point about TAFE, the institution that primarily has supported the development of those kinds of skills. Their funding has been significantly reduced and eroded over a period of time. I think there is a consideration there for government in terms of how you fund the institution that will support the retraining and relearning that is going to become more relevant in the future than it has been in the past. That is also true of universities, but perhaps they haven't had the same sort of severe funding cuts as we have seen in TAFE.

So, there are two issues to think about here. One is the carrots and sticks that might change employer behaviour and the other is the institutions that will deliver that training, because if employers are delivering the training I don't think they will have an eye to the skills that the economy might need. I think that is properly a role for TAFE.

Mr McCartney: Where we are missing out in Western Australia at the moment is something I can talk from mining and gas experience, which is probably the best experience. Once upon a time, when I worked in both those industries, when some new innovation came along that they had onsite we all ended up doing a course, or the people who were connected to that bit of machinery ended up doing that course. Now, what is happening is that the training is left with the dealerships. They fly out contractors who come out and do four days work and then leave the site. I think it is dumbing down our industry.

Senator SIEWERT: On the subject of older workers, I want to go to the point where you left off, in terms of it not being the employer's responsibility. This is very much about the future of work for older workers. We are going to talk about younger workers next. I think you were in the room and heard me ask Professor Duncan this question on policy settings. Do you have a view on how we address that specific issue for older workers who are being made redundant and certainly have the skills but don't have the training for some of the new positions coming along and for the new economy?

Ms Hammat: There is lots of evidence about how the changes that have already taken place have particularly dislocated older men, probably more so than older women. There is probably a body of work that points to the fact that that is exactly what has happened. People have lost their work, usually being made redundant, and they are not really able to re-enter the workforce, because they are not retrained and they don't have the attributes and skills to fit into what would be considered to be the new-economy type jobs. This is a significant issue. It really underlines how the kind of transition that has happened so far has not been well managed. People are not generic in terms of how they might fit into the labour market—they come with particular attributes, particular training and particular experiences. Retraining might provide some assistance, but it won't solve the problem if there aren't jobs available in the geographical areas. There is a whole range of structural issues that act as impediments. That is a real issue and I don't have the answers here today. If I did, perhaps we would have implemented some of them, because I think there is a really clear cohort there that has been dislocated and it is not obvious where those—

Senator SIEWERT: It seems to me that if we can't deal with that issue we are going to have a series of those things happening, because you are going to have people who are trained for specific industries, perhaps, but if we are not changing the system we are going to have cohorts of people dropping into nothing.

Ms Hammat: Correct. I think that's the point the ACTU's submission makes. As industry changes, or as jobs change, there may be some who will prosper from that—the high-skilled individuals who might go into new jobs that are created and they may in fact do well. As their skills are in demand their salaries may go up. There will be some who will do well in the future out of the changes being driven by technological change, but there will be vast numbers of workers who will be dislocated out of what we would consider to be good jobs—good middle-class jobs that have really played an important role in the Australian economy and also in society. There will be a kind of hollowing out of those. As those jobs are lost, the ones they are replaced with are usually low-skill, low-paid type jobs. Growing inequality and the loss of the middle-income jobs are enormous issues. Governments need to make choices to prevent that from happening, and if that doesn't happen you will end up with an enormous inequality. People will drop out of the workforce with no jobs to go to and new people entering the workforce will in fact go into low-paid, low-skill type jobs without a career path. We won't all be at the top of the labour market.

I think it is pretty clear that you will just get a hollowing out of the middle classes and you will get large pools of people with low-skill, low-paid, insecure jobs. That has a whole range of ramifications for them and for a lot of public policy settings—I talked about retirement incomes and workers compensation as two of those—but even greater in terms of just what that impact is on the economy when you have people who are not living middle-class lifestyles and therefore not spending their middle-class incomes.

Senator SIEWERT: Do you mind taking this question on notice? I think you were here when WACOSS was here. In their submission there is a workforce strategy for Aboriginal people in terms of human services. Could you take on board the question as to whether you have been engaged in discussions on that issue and what you think about it?

Ms Hammat: We are happy to do that. In closing can I just say that we didn't put in a written submission but I am happy to provide a written statement that outlines the comments we made in opening, if that is helpful.

CHAIR: That would be great. Thank you to everyone for coming along today.

Senator PRATT: I took some photos. Could we pass a resolution that they are okay and that I can give them to the witnesses.

CHAIR: Does anyone object? No. It is so resolved.

Mr McCartney: Could I ask one question. There are about 4,000 kids north of Broome who cannot read or write, nor their parents. Has the committee taken into consideration where they land in all of this?

Senator SIEWERT: That is an extraordinarily good question.

CHAIR: Thank you everyone for giving us a really good insight into WA issues in particular.

BRUCE-TRUGLIO, Mr Stefaan, Policy and Advocacy Officer, Youth Affairs Council of Western Australia

LUO, Miss Ming, Youth Disability Advocacy Network Committee Member, Youth Affairs Council of Western Australia

ROTHWELL, Mr Mason, Senior Policy and Advocacy Officer, Youth Affairs Council of Western Australia

WORTHAM, Mr Ross, Chief Executive Officer, Youth Affairs Council of Western Australia

[13:58]

CHAIR: Welcome. I understand that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you.

Mr Bruce-Truglio: Yes.

Miss Luo: Yes.

Mr Rothwell: Yes.

Mr Wortham: Yes.

CHAIR: Would one of you like to make an opening statement before we ask some questions?

Mr Wortham: First, let me applaud you for going back-to-back and not taking a break. Thank you for doing that. We appreciate your time and energy. I want to start by saying thank you to the committee for your efforts. We at the Youth Affairs council believe, and we know our members believe, that the effort you are undertaking is extremely important to the future of young people and to the future of our society in Australia. We applaud you for the effort.

I'd like to make an acknowledgement that we're on Wadjuk Nyungar country and we would like to pay our respects to elders past and present and to our emerging young Aboriginal leaders in the community. I'm very fortunate to be joined on the panel today by three outstanding young people. So, I would prefer the majority of the opening statement to come not from myself but, very briefly, from the three of these outstanding individuals.

Let me just say that YACWA, the Youth Affairs Council, if you're not familiar with it, is WA's peak body for young people. Believe it or not, this is our 40th year. We were founded in 1978 on the basis of the rights of children and young people. So, our lens on the world if very simple: it's the welfare and wellbeing of our communities—the future senators! So, we want to see how they are raised and how they grow and how they prosper so that Western Australia can be the best that it can be. With nearly 500,000 young people between the ages of 12 and 25 in WA, we've got quite a large cohort of interested parties in our organisation but also quite a lot of need for us to look at—our membership is made up of young people but also the youth sector.

In the lead-up to a submission like this we prefer not to have our own ideas shared, but the ideas of young people and the ideas of our members. So, intentionally, that's what we've done. You'll see in our submission that we've undertaken a variety of surveys of young people. We've done our best to portray the views and ideas shared by those young people in our submission as well as backed up by research, evidence and experience that we've brought over the last 40 years. Key findings in the surveys, as well as from our experience, are certainly relevant to the inquiry.

There are three key points that we really want to make and that we'll talk about in brief here. One is education. We use that word quite liberally and without a lot of thought, but it's so important, and we want to reiterate the importance—and young people have said to us that we should be reiterating the importance—of the foundations of education, from early years through to primary and secondary school and, importantly, more than just STEM but understanding the basics of life, helping young people to get the foundation they need to be successful in their careers.

Secondly, young people face unique challenges with underemployment and casualisation. You would have heard that through your interviews and research thus far. We want to reiterate the importance of those factors on young people's employment. We'll talk more about that in a minute. And thirdly, we're excited to be able to talk more about technology. Technology is naturally causing a rapidly changing society which creates automation and all of these things that we know may be challenges for the workforce, but also opportunity. What we heard from young people was that serious amounts of opportunity can be undertaken and this country should be capitalising on that technology.

So, with that, I'd like to hand over to Stefaan, who's our policy officer at YACWA, to briefly go through a couple of those points, and then we'll have Mason go through a few points, and then Ming.

Mr Bruce-Truglio: I'm going to start by quickly talking a bit about our consultation process. In January 2018 we conducted a brief online survey to gather information from young people aged 15 to 25 on their views on the changing nature of technology in the workforce. We had a brief time limit for this survey, so we had about 64 responses from young people aged under 25. The respondents were from a variety of backgrounds, and we had representation of young people from both metropolitan and regional areas as well as a number of traditionally disengaged backgrounds, including CALD individuals, those living with a disability, and Aboriginal and Torres Strait Islander young people. Of relevance also is a survey we conducted in January 2016, which had a much larger number of respondents—993 in total—which was talking more about the current-day situation of employment of young people and the job market in today's climate.

One of the main findings from our surveys is that we know that young people are not oblivious to the challenges and difficulties facing them as they transition into a rapidly changing workplace. And our survey showed that many are significantly worried about the impact of the changes on their future job security, their employment status and their working patterns. Coming out of the recent survey was that the overwhelming majority of individuals either did not think that or were unsure that Australia's laws, education and policies were prepared for future changes to the workplace.

So, I'll just start off specifically about education. This was largely divisive in our survey in terms of whether young people actually thought this was sufficiently preparing them; 36 per cent of respondents were not sure or did not think that education was sufficiently helping to prepare them for the workforce, and 36 per cent believed that it prepared them 'somewhat well'. Many respondents referred to tertiary studies as providing them with a sound knowledge base, and they value that sound knowledge base. However, they referred to a lack of practical skills to meet the real-world demands of the workplace. This links back to our survey in January 2016, where 85.4 per cent of respondents indicated it was either difficult or very difficult for young people to find work. A common theme has been identified to us that if we are not thinking about these practical skills for the workplace, are universities thinking about how these practical skills will evolve in the future? Many common themes were identified to us as currently lacking across the spectrum of education, including digital literacy, the use of IT, business and entrepreneurial acumen, interpersonal communications skills and practical experience.

How do employers view study and education, and what do they value? In an employer satisfaction survey conducted in 2017, they ranked technical, adaptive, interpersonal and foundation skills as key areas lacking in educational qualifications preparing graduates for employment. Whilst we understand and appreciate that there is a current focus nationally in Australia on improving the prevalence and quality of STEM graduates, due to a current decline, we need to acknowledge that these skills, like business and entrepreneurial acumen and digital literacy, must be implemented across education to ensure that young people who have a diversity of aspirations and want to study different areas are fully prepared. Many of our respondents indicated they felt left behind by educational institutions and employers alike if they had not studied STEM or business, so it is key that these broad foundational skills that are rapidly changing society are fully used amongst all educational pathways.

Mr Rothwell: We know that young people are most impacted by casual work and insecure jobs. More than any other demographic in Western Australia, young people are employed in impermanent jobs and casual work. These same jobs are most at risk of automation and further casualisation. I think the Brotherhood of St Laurence identified underemployment amongst young people as the highest it has been in 40 years. All throughout our consultation this was a big concern for young people. Half of the respondents to our latest survey were concerned about the risks of casualisation to their jobs and careers. They were worried about underemployment—if they do find work, is that going to be enough to afford the rising costs of living?—financial insecurity and a lack of rights and worker protection with the rise of the gig economy, such as Uber and Airtasker. If that becomes their main source of income, will they have the right protections so that it's a feasible living and source of income?

Sixty per cent of our respondents found it difficult to find work that paid enough or offered enough hours to meet their personal or financial needs. That's absolutely huge. I know anecdotally from a number of our members that that continues to be a problem and has been for many years. Some respondents indicated they were concerned current laws aren't sufficient to protect them in the gig economy, and many are afraid their rights are being steadily eroded. We've seen that recently in the national conversation around penalty rates. That came up again and again throughout our consultation. Given the high rates of casual work for young people, we want the government to ensure our laws are sufficient for this changing way of work and how young people are impacted by it in those insecure and part-time roles. We also want to see if some research is planned to look into the nature of high underemployment for young people, and whether casualisation is the root cause or if this problem is

becoming entrenched into adulthood. Are young people well-positioned to transition out of casual and insecure work into secure salaried roles?

Mr Bruce-Truglio: I'd like to quickly talk about the survey. Young people were largely optimistic about the positive effects of changing technology in the workforce. The majority of respondents agreed that technology will make jobs more accessible, easier and more efficient, and that young people are generally well-placed to harness the benefits of technology. I'll pass over to Ming to talk about some examples.

Miss Luo: I'm just going to talk a little bit about my own personal experiences in the workforce and with technology in general. As a bit of a background, at the moment I'm a university student at UWA in—hopefully—my final semester. Don't ask me what I'm doing after July, because I don't know! So I've had a few experiences in the workforce. I've worked several casual jobs, as a tutor and also as a workshop presenter for National Disability Services. I've also had an internship position with Goodwill Engineering. So I think my life in general is a testimony to how technology increases the accessibility and equity of the workforce. I should have mentioned earlier, but I'm vision impaired with retinitis pigmentosa, which basically means my vision is crap! I rely heavily on technology to do everything that I do. So technology has had such an integral part in everything that I have been able to do and achieve; I don't think I would have been able to do as much as I have done—or with the level of independence that I have been able to—without technology. So I use my computer a lot—a lot! It has built-in assistive software that helps me read and access information. So I've been able to do work and my studies that way.

So I do believe that higher and higher levels of technological innovation would lead to higher and higher levels of integration of people with disabilities in the workforce and in the community in general. But there are two points that I want to bring up. The first one is that I believe that accessibility should not be a sidenote, a minimum requirement that business have to meet as compliance or an afterthought. I think that accessibility should be an integral part of a technological innovation process. Not only will it save costs of people having to go back and fix things further down the track it will also remove a lot of unnecessary barriers for people with disabilities. An example is I've had to do a few statistics courses as part of my degree, and I would say they would be my least favourite units, mainly because they're statistics but also because, as part of the units, we have to use statistical programs that were completely inaccessible to me. I was still able to do the units, fortunately, because I was provided with educational assistants who helped me, basically as my little robot, and I'd just tell them, 'Click this', 'Click this', 'Do that', 'What does that say?' But I feel like it somewhat subtracted from my learning experience and also from my independence as a person who prefers independence. I do prefer to do everything by myself. So that's an example.

Another point I want to bring up is that even though I believe that technology advancements would help people with disabilities to unlock their potentials as well as to integrate into the workforce and society more, I think that the extent of this will be severely capped by employer perceptions and knowledge. As I mentioned before, I've been very fortunate to be able to have work experiences, and they have all been very positive so far. Everyone has been very understanding and very accommodative of my needs. But all these experiences have come from organisations within the disability sector or organisations that are funded by the government. As a person with a disability, from my own experiences, I feel that it's easier to find employment in these sectors because, I guess, of the inherent nature of the organisations in the sector, the work that they do and how they are structured. I think there are a lot less opportunities, or they're a lot harder to get to, in the private sector—especially in smaller businesses as well. I think there are two factors to this, the first one being knowledge. I think that a lot of businesses, especially smaller ones, don't know that there is all this technology out there that people with disabilities can access and which they can use to perform high levels of work and also that there are funding options for them—like JobAccess—that will sort out that side of things for them.

Another thing—the bigger thing, I think—is just general perception. I think people with disabilities are generally immediately labelled as a liability rather than an asset. You could have someone with an amazing resume who comes in and charms your pants off and then doesn't do anything when they get the job. But I feel that, for a person with a disability, as soon as you disclose a disability or as soon as you walk in the door and an employer sees you and understands that you have a disability, the opportunity is gone. You're immediately labelled, as in 'she can't do this' or 'she probably can't do that' or 'she won't be as good as a normal person'. I know that we've come a long way since 20 or 30 years ago, and our attitudes and perceptions have changed immensely, but every day I still see that there is a clear line between people without disabilities and people with disabilities. I think education would be a key to changing this.

CHAIR: Thank you very much. You've covered a really good range of issues there, so I appreciate all of that. I'm going to be strict on senators, though, and give them one question each, and then we'll see how we're going for time, just because we're—

Senator REYNOLDS: With or without supplementaries!

CHAIR: No! No, one question—because we have already covered a range of issues in the opening statements. Jordon, do you want to go first, being the youngest senator here?

Senator STEELE-JOHN: Yes, I'll kick us off. I want to really drill down into what Stefaan was saying about education and what it is providing and what it needs to provide. In particular, we've heard again and again that young people either participating in or entering the employment environment aren't properly equipped with an understanding of their rights and protections as workers. Is that something which was picked up in your research or something which you've experienced broadly within your peer group?

Mr Bruce-Truglio: I think that's definitely something that comes as part of the practical workplace knowledge, and that was reflected in our survey results and in a number of specific responses—that people were actually concerned about these rights and even had a lack of knowledge about these rights. So that is something that's part of this broader knowledge transformation from theoretical knowledge to practical knowledge. Young people need to be taught about how to navigate the workplace and how their rights affect them in the workplace, and then that needs to translate to policy change about providing them with those sufficiently protective rights.

Senator STEELE-JOHN: So more emphasis in the curriculum on that?

Mr Bruce-Truglio: Yes.

Senator SIEWERT: I'm really interested in what happens when young people finish year 12. I don't know if it's the same in other states, but here in WA basically everyone now goes through to year 12. What happens after that? Those who are going to uni might take a gap year or whatever, and then, at least for a couple of years, they're in tertiary education. There are a group of young people who aren't doing that, and I'm seeing a big gap there. Some of them get jobs flipping burgers and things like that, but there's not a lot of support for young people as they come out of school—where do they go? Has anybody looked at that, and do they have some suggestions about what we could be doing about that?

Mr Rothwell: When young people leave high school, there's very much a perception that it is a murky, scary adult world. There is no clear path to education; there is no clear path to secure employment; and, if they choose to pursue education in order to secure employment, they don't know what's actually going to pay off down the line—will this industry exist in 20 or 30 years?

I'd like to touch on something briefly that we've seen down in the Great Southern. When young people leave year 12 in the Great Southern and in many regional areas, a lot of them relocate to a metropolitan area to pursue further work and study. Those who remain behind absolutely see a loss of social networks, and they become quite isolated not just physically but socially. Compounding this is the fact that there aren't as many employment opportunities in those areas. That can actually contribute really badly to some street presence and higher levels of mental illness. That's a real issue in the regions, where we need to be promoting these pathways, and we need to be giving and equipping young people with the skills to navigate this.

Part of what we've been seeing in our consultation is that young people feel that the practical skills are not there in their education. Many of them don't understand how to write a CV. They don't understand where to look for work. They can navigate job-search engines online, but they're having trouble finding opportunities that don't require years and years of experience. We need to actually understand the problem. Do we have enough opportunities available for young people directly out of high school? Then are we supporting young people to find them and enter into them? It needs to be twofold; it can't be just one way. We need to make sure that we've got a workforce that's ready to accept them, and we need to make sure that we've got young people ready to accept the workforce.

Mr Wortham: I would just add to what you were saying, Mason, and maybe reiterate what you've already said. The failure of the transition from high school or year 12 into employment happens well before year 12. This is the point that is so fundamental: the opportunity is lost if we haven't supported young people by the time they're graduating. So there are all of those things that Mason has mentioned. There are some really basic things, which often parents or carers provide most of the knowledge transfer on; they're not systematised. So that is one thing.

The second thing is that the barriers that exist to opportunities for further training or employment or even exploring interests and skills after you've graduated are so significant now, as mentioned in the previous discussion around TAFE fees. TAFE is a really fundamental right that Australians should have, and the cost of

TAFE is extremely prohibitive. That is a very, very fundamental transfer pathway that we need to see barriers being broken down in.

But, beyond just that, I think that one of the challenges is that we, schools—and I have lots of friends and family who are teachers, so I love teachers—treat every young person, often, as if they are the same. We're individual beings. Young people have individual ideas and passions. We need to be able to put in opportunities to nurture those interests earlier, so that, when young people leave high school, they're clear in what they think at least that next year is going to look like for them. So, on those support systems, arguably, we're failing, unless we do them well before year 12.

Senator REYNOLDS: Thank you very much, and thank you to the four of you for your evidence and also for your submission. Perhaps I can take you forward, into the future. Quite often, as committees, when we're having a look at changes or recommending change of policies or legislation, we're always trying to retrofit today's situation into the future, and I fear that that's one of the things we're now trying to do. I had a look at your recommendations. They're all very good recommendations. But I'm thinking that if ever there was a requirement for us to think differently and to say, 'Well, what do we want the future to look like and how do we get there?' rather than trying to retrofit the future on the past, this might be the perfect opportunity. So I'm just wondering if one of you or all of you separately could tell us what the vision is that you see. So, for each of you, in 10 years or in 20 years, what should the workplace look like, and how would you access that and move through it over the course of your life? Not trying to retrofit today, what's the ideal vision for that?

CHAIR: I was going to say, that's four questions! Why don't we take a couple—

Senator REYNOLDS: You did say no supplementary questions; you didn't say no multipart!

Mr Wortham: I will start off with a great quote, if that's all right, from Albert Einstein—that the problems of today can't be solved by the same thinking that we had when we created them. So, inherently, we need new thinking. That, I think, is getting to the point of what you're saying. We need a different way of envisioning the future for Australians—a different way of looking at the success and the prosperity that this country should have. I would agree that we're probably missing the mark unless we really stretch our thinking. We need divergent thinking on how we contribute to a global marketplace and how we support young people to think beyond their home towns to a national—or international, even—market. And technology is a great way of doing that. How do we as a society tap into technology and embed that in a really constructive way in regional WA, in communities of socioeconomic disadvantage, to the greatest adventures that we can?

Arguably, we need more investment in the NBN and we need more investment in the rollout of technology in schools to make that new, untapped, unknown vision come to life.

Senator REYNOLDS: That's the thing—unknown vision. My great fear about this inquiry—though it's bipartisan and it's fantastic—is that we will fall into the older people's way of thinking and putting our own past paradigms onto the future. The quote is great and the things you're talking about are great, but again it's down to, 'We need NBN, we need this and we need that.' Yes, but they're tools and processes. What effect are we trying to generate for you guys in the future?

Mr Wortham: We need to ask young people.

Mr Rothwell: I'll just touch on something really briefly. It might be outside the scope of the inquiry or even outside the scope of your question. I think in the future a workforce would actually look more equal. We need to be looking at the values of young people, and we are seeing very much that they are valuing equality and human rights. Accessing work and employment for the LGBTIQ community, in particular, is fraught. We need to be leveraging technology in a number of ways. We need to be working smarter and kinder in order to support them to enter the workforce, particularly for young trans individuals. Technology can assist with things like blind recruitment. We can be looking at further training. We just need to make sure that our workforce in future is more kind and welcoming to these people, because currently they're systematically excluded. Young trans people, in particular, are living in poverty.

Senator REYNOLDS: Perhaps you could take that on notice. Again, I don't disagree with anything you've said, but it's about process and qualities and not actually about what we are seeking to recommend in terms of the vision, the outcome you want and the environment you want to work in.

Senator STEELE-JOHN: Perhaps the three of you or anybody else within YACWA would like to provide to the committee an answer on notice. What you're asking for is: what does your ideal workforce of the future look like to you, from your perspective? So if anybody would like to contribute that to us, I think that could be really useful.

Mr Wortham: A thing that comes to mind, to chime back in, we as an organisation have existed on the back of the voices of young people in the sector for 40 years. Importantly, that voice changes. We use the term, 'rapidly changing society', and the experiences and ideas of young people are equally rapidly changing to match those needs. So I think we're all slightly hesitant to answer your question with too much of a concrete point, in that we think we need to go back and ask.

CHAIR: Why don't you take it on notice.

Senator REYNOLDS: What do you want us to recommend building?

CHAIR: We'd be very interested in getting something from you on that. Senator Patrick? Sorry, I've got to be the nasty guy that keeps us moving!

Senator PATRICK: He's good at being nasty, too, from experience! Senator Reynolds took you forward but I'm going to take you back to the past. You've described a situation where young people are completing a secondary education and finding themselves in an underemployed scenario. I just want to understand: when you entered into your secondary education, you obviously were presented with a range of choices. Did anyone inform you at that moment of choice what the workforce was going to be like in four years time or five years time? Did someone lay out what the most likely employment options would be so that that may influence your choice?

Mr Bruce-Truglio: In my personal experience, I would say no. There is very much thinking of the first year of uni as the main achievement when you're thinking of ATAR, tertiary studies or going to TAFE. It's not about how a degree or your studies would relate five or 10 years down the track; it's about getting that ATAR and getting to uni, and then the rest you figure out yourself. There seems to be a lack of forward thinking in that respect, based on my personal experience.

Senator PATRICK: Miss Ming Luo, you said you're about to finish a degree and don't have any idea of what you're doing. Did anyone guide you at the point of entry into the degree?

Miss Luo: No, not so much a specific person from school or uni. A lot of my decisions were influenced by my parents—what they thought of the future and what they thought would be good for me.

Senator PATRICK: That's helpful to the committee, thank you.

Senator PRATT: On page 5 of your submission you talk about there not being enough focus on technological literacy and workplace practicality in education. Some of you would have, in your working lives thus far, have already started to experience some of that mismatch. What is it that we need to change about our education system in order to make that a more real pathway? Is it simply that there is not enough of school that looks anything like work? How do we come to terms with that question better?

Mr Wortham: I'd rather one of these guys answer.

Miss Luo: I'll just say a little something. I think that in the education system there's a lot on theory, especially at university. But there isn't too much on the actual skills that you would use a lot at work, say Excel or Word or Outlook—the Microsoft suite or anything. I found that a lot of these things I have had to self-teach or find other people to teach me. Especially in some universities, there are not specific courses that teach you things like that. Also, I feel like work experience should be integrated more into the education. In some degrees, especially mine, it's very much up to you to look for internships or work opportunities. It is not a mandatory part of your degree, which I think would really help, because, when I first walked into my internship role, I was very overwhelmed because everything I learned didn't apply, and everything I needed to know I had to learn on the job.

Senator PRATT: That's a pretty big mismatch.

Mr Bruce-Truglio: I totally agree with a lot of what Ming said. There is very much a lack of incentive, for universities in particular, to provide that workplace practicality and technological literacy. In my degree, internships and practical experience were very much an afterthought. Like Ming said, you have to go out and really seek it out yourself, and there are no easily available options, by and large. Another point is that a lot of the internships I saw were quite expensive and added quite a lot onto your degree, and that can discourage some people from adding to that. That needs to become the norm; the practical experience internships need to be completely integrated into degrees. These internships need to be meaningful and more long term than what they are, because some of them might be only one week or a couple of days or weeks, and then there is a risk of that turning into free labour, as has been quite a worry among a number of students. So, yes, it needs to be completely integrated into the education.

Senator PRATT: Thank you. That's a useful answer, both of you.

CHAIR: Thank you very much for your time. It is excellent to have a perspective from young people, which we haven't had a lot of so far in the inquiry. Thanks very much for coming today and for your submission. Feel free to come back to us with anything further on notice.

TEO, Professor Stephen, Director, Centre for Work and Organisational Performance, Private capacity

SEET, Professor, Pi-Shen, Director, Centre for Work and Organisational Performance, Private capacity

[14:33]

CHAIR: I now welcome representatives from Edith Cowan University Centre for Work and Organisational Performance. I understand that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you. Could you please tell us the capacity in which you appear today.

Prof. Teo: I appear as a private citizen and I am from Edith Cowan University.

Prof. Seet: I'm also from Edith Cowan University, appearing as a private citizen.

CHAIR: Thank you for your submission, which I've had a good look at. There are some great research projects you've got underway there. I now invite you to make a short opening statement and we will open it up to questions after that.

Prof. Teo: The two of us, together with Professor Maryam Omari, who is not here today, are from the Centre for Work and Organisational Performance at Edith Cowan University. We are basically a research centre, comprising academics and early career researchers from the school of business and law, nursing and midwifery, health and medical sciences, and business as well. So we're a pretty broad church. We are very interested in this whole idea of work and how is work being affected by organisational policies and organisational practices. Our remit is basically looking at the future of work and how that impacts employees. So that's why we are here today.

We are making this submission based on two of your terms of reference. The first one, looking at 'future earnings, job security, employment status and working patterns of Australians'. The second one is looking at 'the different impact of that change on Australians, particularly on regional Australians, depending on their demographic and geographic characteristics'. The way we are going to do this presentation is to tag-team. My research focuses more on how work is being influenced by organisational policies, and Professor Seet has broader research interests; he looks at VET training and at remote communities in South Australia. So that's what we going to talk about.

Where I'm coming from is: it is all about work. If you're going to look at the future of work, you have to think about how organisational policies impact on employees' wellbeing. In some of my earlier research, conducted in New Zealand and the USA, we were very interested in how the whole idea of telecommuting as one form of evidence of the future of work impacts on Australian and New Zealand employees. We found that the biggest problem with employees not performing well in that sort of context is the lack of support by organisations in telework instances. The previous presentation where we talk about how young people are not ready for the future of work; here in this case we are talking about organisations not ready for supporting employees to work flexibly in terms of working from home or taking a few days to work at home. When you think about all of that context, there is a lack of organisational support for employees' wellbeing and also for employees' productivity at work.

When you look at what is happening in the Australian public sector in both the Commonwealth and state public sectors, we have agencies undergoing lots of change, and telework is basically a form of change. Even when you look at this whole instance of future work, are organisations ready for future work? To what extent do they actually align their work values with employees' desires to work in their organisation? I suppose that is what the presentation talks about, that whole idea of values aligning with the employing organisation. We found that, when public sector organisations are not ready for change, they are the one that have managers not performing in the right way. This is where you have workplace bullying. We have lots of instances of that in the public sector in Australia as well as in New Zealand, and that's a critical issue for employees' wellbeing. I will pass on to my colleague.

Prof. Seet: I'll make a couple of comments about some of the research I have been involved in. About three years ago, the World Economic Forum released a report about the fourth industrial revolution, looking at how technological disruption, mainly the linkages between what they call the cyber world and the physical world will actually change the nature of work, and they identified nine technologies that were going to disrupt the workforce in the next 20 to 50 years, including AI, 3D printing and things like that. So, about two years ago, on the National Centre for Vocational Education Research put out the call to see how this was going to be really affecting the vocational education sector. I was at that time still at Flinders University, and a few of us put up a proposal. We were essentially going to work with NCVER to look at the relationship between disruptive technologies and skill developments in terms of the VET sector. This was mainly from the industry point of view, whether they were technology users or technology innovators and producers.

I think you've got a summary of the research findings, but maybe I will just thrash out a few of them. First, there was consensus among industry that disruptive technologies were actually going to change the way work was going to be done in the future; in fact, it was already changing the way they were doing things. One thing in the Australian context was the question of who would train these workers in these technologies. The medium-sized to larger firms preferred to have people who were quite generically trained, and they would do all the training in-house; whereas the SME sector preferred to have all the training done by the VET sector or private RTOs and to have the workers come with the requisite skill set. One thing that is confronting the VET sector—and this quote came from one of the senior VET policymakers—is that there are two schools of thought: in one they want a fully trained person. They want a system to spit out this worker with relevant experience, fully trained. And there is another, which is: you do the bare minimum; you give them to us and we will train them. This is something which I think Australian industry moving forward in the VET sector has to reconcile, because you have to do both. And one of the challenges is that there are not enough resources or not enough forward-thinking to manage this dilemma.

The second thing, in line with this, was that employers actually preferred university grads over the VET-sector-trained people because they thought they came with more employability skills, and more generic skills in that sense. While employers and innovators felt that there was consensus about enhanced skill development for disruptive technologies, the employers did not seem to have consensus about what training needed to be done. We interviewed 23 CTOs and we got about 20 different opinions about what TAFE should be doing.

A last point in terms of this was that everybody felt there were employees currently coming out, whether from school, university or the VET system, with what they called deficits in STEM qualifications and STEM knowledge. They want more of that, whether it is within the VET sector or the university sector.

That generally summarises it, and there are a few recommendations in there. They are very similar to the recommendations from the Productivity Commission and the CSIRO, so I won't really go through those. But there wasn't much research that had been done on what the employers want, and we made sure that we looked not only at the bigger end of town but also among the start-ups and the SME sector.

I will just make a couple of comments about the second term of reference, which is the different impact of change in terms of regional Australians. This research went back a few more years, about four or five years ago. I was working collaboratively with the CRC for Remote Economic Participation, or Ninti One, and we were looking at remote area workers, essentially Indigenous art centre managers, who were not Aboriginal. They were flown into these communities to run the arts centres that produced the Aboriginal paintings, boomerangs and things like that. There was a very significant turnover of these people, so the question they asked was: why do these people not stay on in the job? We found that a lot of the issues were around cross-cultural challenges. The typical profile of this manager was: a fine arts or performing arts graduate freshly out of university, normally female. They don't have any experience working in Indigenous communities, and they have no preparation or training to do those jobs. So, by their nature, when they went into these places, they actually have a severe case of culture shock dealing with the Indigenous communities and a lot of the elders there, who are all male, and some of the violence they had to experience. In line with this, towards the later part of the deployment, you find some of the issues around them having to manage non-art-related things like the CDEP and Centrelink issues and all the things to manage their workers.

We did another project a year later, which was about the Aboriginal workers themselves and why they actually like to work in the art centre, as opposed to doing other jobs. We found that there was a very strong prosocial motive: they were given much higher status if they were doing Aboriginal art than if they were doing other types of jobs in the local community. Thank you.

CHAIR: Thanks. You've obviously got some very broad-ranging research projects going on, so thanks for making us aware of them.

Senator PRATT: I want to ask you, Professor Teo, particularly about your statements about the Australian public sector and relating that to our terms of reference. What does a proactive framework look like for dealing with workplace bullying, as opposed to doing it in hindsight? Is it something that could be legislated for in the Fair Work Act, or is it more complicated than that?

Prof. Teo: It is a complex issue, but I agree with you: it should be in the legislation, because at the end of the day New Zealand has done it as part of their legislation, so I think it would be really great for Australia to do the same thing, because we have to be proactive and stop the problem before it even appears.

Senator PRATT: What did New Zealand do in relation to workplace bullying?

Prof. Teo: They actually considered it, if I'm not wrong, as a psychosocial hazard, so they actually put it in there and said that there's a wide range of different penalties, I suppose, if you were to be found bullying in the workplace.

Senator PRATT: You're essentially arguing that you've found evidence of fairly systemic psychosocial hazards in the public sector.

Prof. Teo: Correct.

Senator PRATT: How does that compare to the private sector and the capacity of the public sector versus the private sector to cope with change?

Prof. Teo: Most of the research that's in the literature talks about people experiencing bullying. It's usually around 20 per cent of those who took part in the survey or the research. Similarly, in my research, whether it's in the public sector or in the private sector in Australia, New Zealand and also in the US, it's around that number. Between 16 and 22 per cent of the people who took part in the survey reported that they've been bullied.

Senator PRATT: So there's bullying that exists within both sectors on a reasonably equal basis.

Prof. Teo: Yes, that's right.

Senator PRATT: Are the ways you would fix that the same within both sectors, or are there things that are different about the public sector in Australia?

Prof. Teo: I think in the public sector what you get tends to be a question of having less to lose, but then bullying tends to be larger in terms of intensity, and it tends to be managers behaving badly, unlike some of the cases that we see in small business in Australia, where employees are put into really bad hazing situations. So I think it's all about managers not knowing what's the correct thing to do. Also, the climate of the organisation doesn't support employees having a voice, taking part in decision-making and having a say about what's going to happen to their job. So, when you put that into the future of work context, all this AI and disruption technology is happening and managers just assume that employees are ready for it rather than making sure that there's training or that they're equipped to engage in that change.

Senator PRATT: And you're indicating that those problems are just as true of the public sector as they are of the private sector?

Prof. Teo: Correct, yes.

Senator PRATT: Thank you.

CHAIR: Can I just pick up on that point myself. One aspect of what we're looking at in this inquiry is the future technological change that's coming into the workplace, and it's sometimes easy to forget that there are a whole lot of other things going on in the workplace, given the amount of focus on technological change. But whether we are talking about technological change, which is obviously happening in the public sector workplace just as much as it is in the private sector workplace, or other forms of change, do you think the key to it is getting the change management process right? I saw in your submission that you make some points about the sharing of information and involvement in decision-making. What do you see as the most effective ways of private or public sector organisations implementing change well?

Prof. Teo: This is the luxury of being an academic. I like to see change irrespective of whether it is about technology or whether it is about redundancy restructuring; it is all about change. Obviously, if you were to talk to the IT academics, they would have a very different view, where change in our technology is more than just change management. Yes, I agree with you. It is about having a proper change process put in place, knowing what needs to be changed, and also having clear performance expectations out of all that process. Communication is important and participation in decision-making—that is, the employee voice—is important as well.

CHAIR: Sometimes we've been referred to Scandinavian countries and Germany as the peak examples of doing that kind of change well. They have obviously got quite a different cultural setting to Australia. Where should we be looking internationally, if we are looking for best practice?

Prof. Teo: That is a difficult one. If we were to look towards Germany, we would have to change our IR system completely to take that into account.

CHAIR: I'm okay with that. How about you, Senator Reynolds?

Senator REYNOLDS: Do you really need to ask?

Prof. Teo: I am an academic, so I talk about the most radical way. Given my researcher interests and training, my personal opinion is that the American model of management where it is focusing more on using managerial

practices and processes as a way to enact change is the way to go. Then you don't have to change your whole industrial relation system—bearing in mind, I am an organisational researcher.

CHAIR: So you think that, even though in some respects the United States probably have a less regulated industrial relations framework to Australia, in many instances they do a better job of change management than what we see in Australia? Is that what you're saying?

Prof. Teo: That is where HR is very important—human resource management. If your managers are not trained and ready to implement change then you can't give them that autonomy and power to effect change. In that sort of circumstance, training of managers and management development is critical. Compared to the Australian system, it is different.

Senator PATRICK: I have just a couple of questions. First to Professor Teo: shifting away from change management to the telecommuting topic, what is the exemplar country for telecommuting and why do they do it well?

Prof. Teo: That is a good question. I am trying to recall whether we compare our research in Australia with any other country. I don't think we've done that. The problem with academic research is that we all have a different definition of how to measure telecommuting. For hours, we look at the number of hours people are not working in the office and working from home. So we have a range of hours, ranging from zero hours to about 30 hours, from memory.

Senator PATRICK: So you've only really looked in the one jurisdiction. We could be doing it very well, or we could be doing it very poorly.

Prof. Teo: Correct. We found that the ones who do telework really well are the ones who emphasise telework as the way to improve the organisational performance. So I suppose what I'm trying to say is that, if you do link your outcome variable, in this case productivity, and engagement in job satisfaction with the mission of the company, where they support flexibility, that is going to do well compared to those who don't have any policies in place; they are the ones who don't do well.

Senator PATRICK: Sure. And now, switching to Professor Seet: you said that you ask 20 employers about what TAFE should be doing and you get 21 answers or something. If the employer doesn't know or agree on what TAFE ought to be doing, in some sense it begs the question: how does TAFE know what TAFE should be doing, and what's the solution to that problem?

Prof. Seet: I think that the solution that TAFE has taken is to set up this, to really enhance the collaboration between employers and the VET sector. In the last year, the Australian industry skills committees have actually taken on a much more active role in changing the training packages and trying to make them more responsive to some of these things. But what has happened is that it's still a national approach and it's still an industry-specific approach and there's not, in my opinion, enough room for experimentation. If you take the previous question you asked—'Which countries are doing it well, in all?—in our report, most of our literature is from Germany, because the Germans are studying this with intense fervour. They really want to understand how they're going to structure their training 20 years down the road.

Senator PATRICK: That's part of their INDUSTRIE 4.0; is that correct?

Prof. Seet: Yes. And they're really taking a whole-of-industry, whole-of-country type of thing. In Australia the two who are actually doing some experimentation are New South Wales and Victoria. Victoria set up in Swinburne uni, and now they've just set up another lab—what they call a test lab, a Factory of the Future thing—which is very much a German model where you take somebody in as an apprentice and you bring the person through, all the way up to university. In that Siemens project with Victorian government funding, that's one model.

New South Wales have taken the complete opposite approach and gone to Sweden and set up the Stockholm School of Entrepreneurship, which they call now the Sydney School of Entrepreneurship. They're finding that this big Factory of the Future model may be irrelevant by the time they get it through, so they are training entrepreneurs. The states that are actually struggling a bit because of resourcing are South Australia and WA, so they don't have enough money to do this much experimenting. But what will be great is that the VET sector is a bit more flexible. These industry skills committees can do similar industry, not state level, experiments.

I'm from Singapore. I understand from Dr Barratt that there were some questions about the Economic Development Board. The irony is that last year I spent some time with SkillsFuture, which is the same organisation in Singapore, trying to look at some of these issues. There, the division between universities and the polytechnics is even bigger than the division here, so people from Australia or Europe are more interested in what's happening in Singapore than the Singaporean universities themselves.

Senator PATRICK: It sounds to me like the New South Wales entrepreneurs will be employing the Victorian tradespeople if this experiment goes right.

Prof. Seet: Victoria is taking a big bet that the German model is the model going forward, whereas New South Wales is taking the Swedish model as the model for it. I think that the nature of these innovations and technologies is so uncertain that a much more experimental approach needs to be incorporated in industry and government.

Senator PATRICK: Just finally, because you have some knowledge of this: do you think the Economic Development Board in Singapore is a successful model?

Prof. Seet: I think it is a successful model, and I think in that sense what's interesting is that all the states here seem to have their own economic development boards, but there doesn't seem to be something at—

Senator PATRICK: At the national level.

Prof. Seet: the Commonwealth level to synchronise or coordinate all those activities.

Senator PATRICK: Thank you, Professor Seet.

CHAIR: Are there any other questions before we finish up?

Senator PRATT: I would love to, but—

CHAIR: I'll give you a couple more minutes.

Senator PRATT: Professor Seet, you've talked about better recruitment procedures for remote communities. What is it that we need to do in the context of this inquiry, which is about the future of work, pointing to the Fair Work Act and other things, to take account of how different these communities and cultures are—to the extent that they sit entirely outside the cultural context of other workplaces.

Prof. Seet: I'll start by saying what we don't need to do. You don't need to improve their broadband connectivity. They have the fastest broadband in Australia! All our research is done by Skype, and we had trouble, not them. They are so connected to the ecommerce system of the Aboriginal art galleries. They have no problems with broadband, because of the satellites. It's not the technology. It's the nontechnology side of things that is causing issues. The context of arts centres is that they are actually employees of the board, and the board consists entirely of Aboriginal elders, many of whom don't have the requisite skills or education and literacy. It's a pure outsource model. They outsource it to recruitment agents, who don't, therefore, have what Professor Teo has said: a set up system of proper recruitment, selection, induction and training. It just adds to the cost. These Aboriginal or regional communities aren't going to bear with the cost, so they do the bare minimum. I think there's a market failure. Somebody needs to come in and address that gap. In some places where you have the peak art bodies they've tried to come in an do that, but that's also subject to the up and down of funding.

Senator PRATT: I think in that sense, in the context of this inquiry overall, if we were to look at recommendations around future work and remote communities, it's recognising the extent to which there is market failure in a whole range of ways that services and work are managed when dealing with remote communities, and that if we're going to connect remote communities to the economy then we need to work out how we deal with that.

Prof. Teo: If I may add to that, the point that I was trying to make earlier was that irrespective of the change that you're implementing—but it's the future of work due to technology disruption—you have to think about organisational issues. Most of the time when we look at the sorts of challenges facing Australian society we tend to look at it from a macro level, thinking that it's changing legislation, giving people more skills. We never think about whether managers are ready to implement change. That's what I want to leave for the inquiry: organisational factors are equally as important.

NORMAN, Mr David, Senior Policy Adviser, The University of Western Australia

SCHULTHEIS, Dr Marco, Chief Strategy Officer, Curtin University

[15:03]

CHAIR: Welcome. I understand that information on parliamentary privilege and the protection of witnesses and evidence has been provided to you? Great. Do you have any comments to make on the capacity in which you appear?

Mr Norman: I am here as senior adviser to the Vice-Chancellor.

Dr Schultheis: I am here for the Vice-Chancellor.

CHAIR: I know you haven't put any written submissions in, but if either of you has an opening statement that you'd like to make feel free to go ahead and then we can ask some questions.

Mr Norman: I have a few words to say. The first question, I suppose, is: is there really a cause for worry? Everyone's in panic at the moment about change and all this sort of thing. When I've been reading the submissions that people have put in, a lot of it has been about the doom and gloom which is coming our way. As to the extent that's true, I'm not sure. Clearly change is happening, but how fast is it happening?

One of the things which are really regularly quoted is this thing about 40 per cent of the workforce, more than five million people, losing their jobs. That is from that CEDA report. You probably would have noticed that last week in *The Australian* the author of the report which led to that 40 per cent figure said, 'That's not what I said; what I said was that 40 per cent of jobs would be impacted or would be susceptible to change.' When I tried to search for that article, all I could find was the CEDA report itself being repeated again and again and again. There's a danger in academic work that one particular finding gets reported so frequently that it takes on a life and a reality of its own.

The other thing which I'd point you to is this paper, 'False alarmism: technological disruption and the US labor market, 1850-2015', which looks at job churn, which is the number of jobs lost and the number of jobs gained added together as an indication of how quickly jobs are changing. As you can see, it's reviewed all the way from 1850 to 2015. Obviously the data is mildly ropy for some of those years, but what it shows is that the rate of occupational churn today is actually at its lowest in that entire period from 1850, and job losses today are half what they were in the 1960s, the 1970s and the 1990s. So it looks at that entire period. It gives examples of things like elevator operators and locomotive engineers, and it shows, for example, the drop in the numbers of locomotive engineers and the increase in the numbers of automobile mechanics and repair people. What it's basically saying is that there's always been change, and it puts forward the idea that the rate of change today is slower than it has been previously. It also makes the point that in no decade in that entire period did technology create more jobs than it eliminated. The job growth was a result of productivity in existing work areas rather than new jobs arising as a result of the technology. The last point it makes is that the ratio of technology jobs created to jobs of all sorts lost is actually highest in the last five or six years, which means fewer jobs are being lost as a result of technology changes than were being lost in the period leading up to the last five years surveyed here.

So it's a note of caution. Do I fully believe it? I don't, no. My gut feeling is that we are in a time of more rapid change than before, and the warnings and discussion about today's schoolkids having a vast number of different careers and jobs ring true to me. But there's a danger in groupthink and in thinking that we're on the road to ruin. As I said, I'm assuming that actually we're not quite on the road to ruin, but we are on the road towards increasing technological change and increasing change in the numbers of jobs and things which you do.

So what are the solutions? What should we be looking at? Marco and I are both coming at this from a university perspective, but for me the first part of it is school. We know that educational disadvantage sets in very early in life, and disadvantage sets in before the kids even reach school. So school is the first part of it. Lifelong learning is the next part of it, and that's where maybe we've got something more to say as a university about how we can participate and assist in the retraining which goes on. Our traditional model, of course—going back to when I was at university and when those of you on the panel went to university; presumably we were part of a very small minority—is that most people went to university at 17 or 18, and that was it. That's changing now, and it's going to need to change further as we need to retrain people. The other part is research spending. You will have seen that the OECD figures came out last week. Research generates ideas and jobs, and we're still at 1.9 per cent of GDP below the OECD average. The gap between Australia's current spending on research and the OECD average is at its greatest since the year 2000. So for me there are three areas in which we as a country need to improve things: schooling, lifelong learning and investing properly in research.

So what are we doing at UWA? Well, a decade ago, we started thinking about: what is the future? And the future we saw was a future in which we needed to prepare people as generalists who were then able to adapt and change to different work styles and different jobs as they went through. We looked at engineering, for example, and we realised that, three to five years after graduation, most engineers were managers, so we needed to build into our degrees something which allowed communication skills and management—things from outside of the subject area and the kinds of life skills which allowed lifelong learning and change. So that's what we did back in 2012: we changed our undergraduate system in the same way that Melbourne had a couple of years previously, to create more general undergraduate degrees and then postgraduate, professional degrees, which then enable people to develop and adapt as their work tasks change.

What we're doing right now, 10 years after we started that process, is looking more and more at what we can do in terms of internships, work-integrated learning and the kinds of skills which, when we built our new model of graduate attributes, we thought were critical at the time. They were at the time, but they're probably changing now. There are a lot of things around the ability to work in a group, the ability to work with people from different cultures, numeracy skills, technology skills and so on, which we're building into our degrees.

CHAIR: Thank you very much.

Dr Schultheis: Thanks for the opportunity to provide some input into your inquiry. As David mentioned, the disruption we're going through isn't a new thing, and we've had different disruptions for hundreds of years, from canals to railways to the invention of the printing press et cetera. However, I guess the disruption we're facing now is the one we're facing in our time, and so what we feel is that we really need ongoing work to actively monitor and predict how that technology will continue to disrupt our work environments.

The critical point we want to make is that we need to support our workforce that is being disrupted by that change by explaining to them that that change provides opportunity. We need to start creating a positive narrative around that change, particularly for those people who are already in the workforce and are being disrupted, like the truck drivers on mine sites who might be displaced or told they're going to be reskilled into new jobs—what are those new jobs, and how will that journey look for them in terms of being reskilled?—so that it's seen as a national opportunity rather than something that creates an environment of angst around the digital disruption that we're facing.

We're already getting a lot of disruption in sectors. In the mining sector, as I just mentioned, it's around changes to autonomous vehicles. We heard that last week from the CEO of Rio Tinto on their use of automated trucks. That's all really great and it makes Australian more competitive, so we've got to continue to embrace those opportunities. There are opportunities in agriculture around the same sorts of automation and the use of sensors et cetera, and of course data analytics is across all sectors. You look at the higher education sector in the way we use learning analytics to support students and to identify students who may have learning difficulties so that we can intervene at an earlier stage to help their learning journey.

So at Curtin we've already got a lot of capability around supporting the innovation that's needed around some of those technological changes. You will have heard from Alan Duncan from the Bankwest Curtin institute. We've got Innovation Central, which is a partnership between Curtin, Cisco, Woodside and CSIRO where we're looking at entrepreneurship and start-up opportunities and the use of that technology. We have JCIPP around the policy environment, and the Institute for Computation around the use of analytics. It's: how do the universities and the university sector support industry, government and the community to innovate within that technological change that we're going through? There are some really great opportunities to work in collaboration, not just around how we might research what technology we use but also on the impact on communities and the discussion around the policy debate that needs to happen.

If we look at what's actually happening in terms of what we could do to reskill the workforce, we need to start looking—and David mentioned this as well—at developing the sorts of skills that employees of the future will need for the multiple careers they will have. As David said, that will start in the secondary system. So how do we, across that life cycle that an individual has, develop a lifelong learning journey where the educational sectors work in collaboration to build those blocks of learning that are required from the secondary sector to the tertiary sector to higher education? It is getting those sectors to work collaboratively but it is also defining what role each of those sectors plays. I think that will be a really critical part of preparing us for the challenge that we've got ahead. Partnerships with employers will be really important in establishing how we reskill some of the people who may be displaced as a consequence of the digital disruption that we are facing. It's only going to be in partnership with those employers and with government that we'll develop the solutions we need for that.

In alluding to the higher education sector I mentioned learning analytics, but we've been disrupted ourselves. Look at massive open online courses, online learning, but also the flexibility that our students now expect from us

as a consequence of the changing work patterns they have. Most of them will be employed part-time already. A lot of that is disrupting our sector but it's creating those opportunities to innovate. I think Australia has been doing really well on that front, with a lot of our universities leading us globally in that. We've got to make sure we keep that global competition in mind. When we either adopt or resist some of that technological change we've got to make sure that we stay globally competitive on that front.

CHAIR: Thank you very much. There was obviously some commonality in some of the issues you both raised. Starting with the point about the need to prepare students with the future skills they are going to need, can you talk to us a little bit about what each of your institutions is doing to work out what those future skills that people need are and what else could be done, whether it be by government or educational institutions, to improve those.

Mr Norman: What we've always done is talk a lot to our students, talk a lot to employers in Perth and talk a lot to schools as well. For our 2012 changes, that's the process we went through. We didn't just pick that model out of the air; we chose it as a result of deep consultations with schools, parents, graduates, current students and employers. And that's what they were telling us. They were telling us back then, when we started a decade ago on this, that it's not enough to be a subject matter expert. It's not enough for the universities to pump out lawyers, economists, doctors, engineers, schoolteachers—whatever—who are just specialists in that thing; people need skills such as the ability to work in groups, the ability to communicate, the ability to understand their subject matter expertise from the perspective of someone who is not a subject matter expert.

What employers are telling us today, rather than 10 years ago, is that they feel that in future it will be teamwork. It won't be a bunch of engineers; it will be a bunch of people with a variety of different degrees working together, because a whole range of skills, not just STEM skills but the humanities and social sciences, will be needed for most jobs. You cannot function in those teams if you can't communicate because you don't know anything at all about anything other than the subject which you've studied. That is what people are telling us.

The other things that people are talking about are ethics and general employability skills. I spent some time working for the UK government in 2010 through to 2012. One of the big things there was higher apprenticeships. We went to see Rolls-Royce aerospace, where they had a lot of this going on. They were saying that a kid there graduates, at 23, 24 or whatever it was, with a bachelor of engineering but they've been turning up at work at 8.30 for a nine o'clock start and leaving at 5.30 for a five o'clock finish ever since they were 18, whereas the graduates turn up at 9.15 for a nine o'clock start, want to be on Facebook the whole day, and so on. There are employability skills that we need to pass on to the students too.

Senator PRATT: I'm very pleased to see that's gone mainstream!

Mr Norman: There is research led teaching, as well. People are telling us the value of inquiry and research led teaching. The processes you have to go through as an academic in terms of framing a problem, figuring out what the solutions are and working towards that are things which pay off and rub off on the students too. This is something which the focus groups we run tell us are important. People are talking about the sort of vacuousness of young people today with the 'liking' and 'sharing' kind of culture rather than the analysing and understanding kind of culture. That seems to be an important set of skills that universities have always developed in people, but it's increasingly important where people don't tend to want to read more than 50 words. Sometimes in life—maybe always in life—you do have to get past the surface of the idea and into the depth of it if you really want to understand it and make positive change.

CHAIR: You might want to answer this as well. Do you think that that identification of future skills needed is something that you think your institution is on top of, or do you think there's a bit of a role for government or some sort of cross-institutional collaboration in that space?

Mr Norman: I can answer that quite briefly: when I was in the United Kingdom I was working for the Higher Education Funding Council for England, which is an arm's length body which distributes both the research and the teaching grants to universities. What they had and what we don't have here is an organisation like that which is not a think tank. It's a quango, a semigovernment body, which does a lot of the research and thinking and it identifies things. It does a much, much better job, and, consequently, they have a much stronger system in terms of evidence based thinking and decision-making than we do here.

CHAIR: Do you want to pick up on any of that?

Dr Schultheis: I'll answer that on the second part. To go to your first question, if I look at some of the things that we're doing, I think the sector, as a whole, has probably not been great at this in the past, but we've certainly improved—that is, engagement with industry. We're really getting connected with industry and getting to

understand what the contemporary practices within industry are and where industry is going in terms of the skills that they need. There needs to be a much stronger dialogue and closer partnerships between the university sector and industry to find out what the requirements are and how industry is changing. That needs to directly change the courses that universities deliver.

If you look at many institutions, you see they tend to teach things the same way they taught them for quite a long time before there's any innovation of that curriculum. I think there's a lot happening at the moment as, for a lack of a better phrase, the lights are going on for universities and we're starting to engage with industry a lot more. I know we're doing that at Curtin University. We're so much more engaged than we have been in the past in terms of dealing with industry around what they need in the courses and what skills they need for the practices that they have. Programs like work-integrated learning, where students are moving into industry as part of their study where they can see some of those practices in action, is really powerful. It gives them that in situ experience that a student needs, bringing industry into the class around the more innovative things that they may be doing that you can't really teach people in a classroom environment, particularly as much of that classroom environment is online nowadays.

Following up on the skill set—I won't repeat the ones that David has talked about—I might add a couple that we're working on and embedding into own curriculum: analytical skills and problem-solving skills for students. As we move to a more global workforce, our graduates will have careers where they not only might be working within different countries but also will have to work with different cultures across the globe. They'll have more of a global workforce network, and those cross-cultural skills will be really critical for a graduate to have. It's really important that we embed that so we don't isolate ourselves within Australia as being just about Australia, so that we recognise the fact that the workforce will be a global network and so that our graduates will have to work across cultures and across continents.

Senator PRATT: In terms of the issues you've raised, what's the role of government in pushing things in the right direction in terms of what government itself does at a national level? And then what should it be doing to leverage, direct and work with universities, TAFEs, schools and industry to foster the kinds of partnerships you talk about?

Dr Schultheis: When I talk about partnerships and I talk about industry, I think that's a three-way partnership between government, industry and the education sector, be it tertiary or higher education. I think the government plays a role where the government is the catalyst for some of that engagement and collaboration, so government needs to create an environment that incentivises some of that collaboration—collaboration on research around these things but also collaboration around incentivising, and that doesn't always mean financially but is really creating an environment where industry and universities can work together rather than an environment where that is, I guess, held back.

Senator PRATT: You could do it via incentives, but you could also create obligations in terms of—

Dr Schultheis: You could, yes.

Senator PRATT: how they're funded?

Dr Schultheis: You could create targets and other things, yes.

Senator PRATT: What does government need to do differently, in that regard, from what it's doing now? There are lots of places where we see that kind of innovation and collaboration, but what is it that we need to change?

Mr Norman: I can think of two areas. You talk about incentives and obligations. First of all, there are the incentives and the sort of technology park, innovation hub, kinds of ideas. People need to want to work together, so just creating a technology park and making it cheap to operate there doesn't mean that people are actually going to go there.

Senator PRATT: I've seen that before.

Mr Norman: It's one of those areas where it seems like an obvious one where government should intervene and create incentives and help, but our feeling at UWA is that assisting things when the idea is already up and running probably is a better idea than jumping in and trying to manage it from afar.

In terms of obligations, academics are driven by their research and teaching obligations and rewarded for their research and teaching obligations. The research funding until very recently has been focused very much around publications, churning out PhDs. From my perspective, it's a great thing—it's disruptive; it's a great thing—that there's increasingly a push towards real-world impact and the measurement of real-world impact, which is complicated. It's a difficult thing to do, but it's important because academics need to be motivated. People like

Marco and I, as administrators, can do whatever we want to cajole and persuade people to do things, but in the end it comes down to what works for them and their careers. So, in terms of the obligation thing, I think pushing more of the funding—the government funding, the taxpayer funding—to things which incentivise collaboration between industry and universities is a really, really important part of this.

Senator PRATT: Thank you. That's a good answer.

Senator SIEWERT: I've got two areas of questioning. One is around lifelong learning. We've talked around where we're going with some of the undergraduates, but where is your thinking in terms of the lifelong learning? People are going to have a number of different careers, but also, as you said, as people develop in their careers, technology is now at such a point that, even in the same area that they're working in, people may need to go back and do some further study.

Mr Norman: I think there are two elements to this. One, which I think we should only talk about really briefly, is the utopian and maybe dystopian world where people don't work very much anymore.

Senator SIEWERT: Yes, let's move on from that one for the time being.

Mr Norman: But, to talk about it briefly, there is potentially a role for the universities there in helping people to understand what life is about and to take pleasure et cetera et cetera.

Senator SIEWERT: I'll believe that when I hear it, because we've been talking about technology and—

Mr Norman: We've been waiting for it for a long time, I know, yes.

Senator SIEWERT: Yes. Who's going to pay for it?

Mr Norman: But, in terms of lifelong learning to allow people to retrain et cetera, that requires a shift in the universities' degree models. All the universities are talking about it now—about microcredentials. We thought MOOCs were going to be it. I'm not sure that they are. It seems that MOOCs instead are things which are done by people who already have a bachelor's or a master's degree and want some additional study. The basic idea of microcredentials is that people would study a unit or less of a degree and it might be all they do, and that would be acceptable and that would have some kind of qualification attached to it. To me, that is the way to go. If you're going to have to have four or five different careers in your life, you're not going to want to do a two-year full-time masters each time you change career. You're going to want four weeks full time or something along those lines. So we are going to be needing to change what we deliver.

Senator SIEWERT: I am very focused on not only young people but older workers into the future. For people that haven't got a degree but have been working for a long time and then find themselves unemployed and are being told, 'No, you haven't got a degree,' they can't afford, quite frankly, to do a three-year, say, bachelor of science degree—it is a particular issue that I have got in my mind at the moment. What can you do for those people that need that piece of paper and that have 30 or 40 years worth of experience?

Dr Schultheis: As David said, I think that is where some of those microcredentials come into it. If you look at the university sector, we are still very traditional in terms of undergraduate and postgraduate programs. But the thing that has innovated within universities—and I still think there is some hope for massive open online courses; and the trends on that are still quite positive—is that for someone who has been displaced, who can't afford to pay whatever it might be—$30,000 or $40,000—for a program—

Senator SIEWERT: It is also the time. For an older person, they can't afford three years financially or in terms of getting back into the workforce.

Dr Schultheis: It will be short modules of learning that over time are quite stackable, that may give you a qualification; but they may never give you a qualification. We sometimes get really caught up about things like completion rates; but, in a way, it is quite irrelevant, because people come and go from their study and they do particular modules. As we get more into the online technologies, there are economies of scale that we will get from that, and those quite flexible online programs come at a different cost point.

Senator SIEWERT: I hear what you're saying. Go and tell an employer that. When you've got someone writing in their CV—and they can't say 'I have got a degree in this'—'I've got this module and this module,' employers will still go for somebody that has got a degree. When they are whirling out people with degrees—and there are hundreds—it is not going to help somebody who says they've got a couple of units or modules to get the job. How do you tackle that? And how do you work with employers? I see that the tertiary sector has a role to play with employers to say, 'Listen, this is just as valuable as this.'

Dr Schultheis: Not to disagree with you, but would there be a future point where employers might look at it through a different lens? We're looking at it through—

Senator SIEWERT: Yes, but how do we get them there?

Dr Schultheis: I guess it's showing the value of some of those modules, some of those microcredentials, the micromasters, and working with them to ensure that they are providing a quality education.

Senator SIEWERT: The point made by, I think, our opening witness this morning was 'the future is now'. So you are talking about the young people that are going through the system now, because they are going to feel the effects of this, and the older workers that are already feeling the effects of this. I am trying not to leave them out of the equation. How do we fix it now in terms of you working with industry and employers to make the points that you just made?

Dr Schultheis: I concur. I think that has been the common theme in what I've been saying. It is partnership with industry to work in with them. There are opportunities to develop programs that are part of industry's developmental programs within an organisation where the universities deliver the modules for the professional development within an organisation, in partnership with the organisation and for the organisation. But if you are talking about people that have already been displaced out of their role—

Senator SIEWERT: Exactly.

Dr Schultheis: they're going to be operating at a different price point. How do we provide something to them that they can afford, having been made redundant or whatever it might be? It is having high education available to them. This is where those modules are at a different price point, obviously. Is there support from government, perhaps, for people that have been displaced? Are there scholarships they could get et cetera? Is there an obligation on the employer to support people that have been displaced, if we are looking at it on a grander scale?

Senator SIEWERT: Yes. Well, there ain't at the moment!

Dr Schultheis: No.

Senator SIEWERT: While the chair's distracted, I have another question. In terms of industry and working with industry—I'm not dissing it at all—if you're dealing with a sector-wide industry, and you're sharing information and working with industry, how do you get past the competitive nature of industry, where they may have their own IP or whatever? How do you deal with that?

Dr Schultheis: I think that happens already. We have PhDs that work within industry, and we have academics that work within industry. I guess there are some aspects of the research that's conducted that are, after a particular time, made public, and other bits obviously have to remain IP as part of it. The competitive element holds that back, but that currently happens already. There's research that happens in industry from universities with industry. Some of those aspects obviously are to the benefit of that organisation, and there are time periods that expire where that's obviously then made available, and there are protections in place around patents and other things that protect industry from that, but it still allows for that really rich research environment and an opportunity for industry to collaborate with universities around research.

Senator PATRICK: Presumably industry and academia are also very familiar with the idea of background IP and then foreground IP.

Dr Schultheis: Yes, absolutely.

Senator PATRICK: So that can be managed, I presume, in that environment.

Dr Schultheis: Yes, definitely.

Senator PATRICK: Firstly, on the paper that you mentioned, I'm wondering if you could hand that to the secretary. I'd be interested in having a look at that. You're not the only person that's suggested that change has always been there. In Queensland we heard evidence along those lines, although I'm not sure they suggested it was slowing.

In some sense I think everyone's agreeing that change occurs; it's just the magnitude of the change at any particular point in time. So what we're trying to deal with here is change. I was interested that in Queensland we heard people saying that the key attributes for success in that environment are intelligence, conscientiousness, self-efficacy and optimism. Where in the cycle does that get brought into the picture? Is that a secondary school thing? Is it a tertiary education thing? Obviously you could combine your microcourses with those sorts of personal attributes. Where does that come into play with those sorts of attributes?

Mr Norman: I think you're right. I have a primary school child and a secondary school child, and I've been very impressed. They've been educated in three different countries, and none of the education systems they've been through prepares them in the same way as the Australian one does on things like resilience, in particular, and getting on with it. I'd add interpersonal social skills onto that list you got in Queensland. They are really critically important—probably the most important. I think we do a very good job of that at primary school, but it's a tough

one, because the education system is not the only influencer on kids or on adults. So it's a tough one, but I think we do a good job already in schools, and I think universities are doing a better and better job of it.

Senator PATRICK: The other extreme of what you're talking about was that you need to teach generally, but I presume there's still a place for experts who know more and more about less and less.

Mr Norman: Yes.

Senator PATRICK: Once again, my thought was that those sorts of people, if they have those attributes, can probably jump fairly easily, but someone like a quantum physicist, I imagine, can't be a generalist. Would that be fair? You still have to cater for the experts in a particular field.

Dr Schultheis: Obviously some of those professions will be less disrupted. If you look at the types of professions that will be disrupted, as you get into those specialists in some of those fields and those professions, there'll be less disruption, so they will probably have a career path which sits within that field of expertise. So their need to be a generalist across other fields is probably not as relevant.

Mr Norman: You still have a training system which allows that, going through the PhD and beyond. The vast majority of people with a PhD don't go on to be scientists or leading researchers anyway. Even for those who do, I would argue that the most successful by and large actually do have broad general skills, communication skills, because in the end it's about communicating your ideas. There's very little of the sole genius sitting in a room by themselves creating stuff. Mostly it is about teamwork and communicating your findings. Even for these people, the broad generalist skills are really important. But the system still, as it currently exists and as we see it off into the future to the PhD model, will provide a way for the very specialised people to know more and more about less and less, as you say.

CHAIR: Last thing from me—and we sort of touched on this a little bit as well. Very directly, just as I was asking about whether there's a role for government in assisting to identify some of the future skills that students are going to need and working with you around that, do you think that there is a greater role for government in managing that coordination between institutions and sectors? Obviously, these days there'll be a lot of students who, as well as gaining university qualifications, are getting VET—maybe a bit from each. Do you think that the system is working fine? What else could be done there?

Mr Norman: We absolutely need to look at the whole system. There has to be better integration. There has to be closer working together for the lifelong learning between vocational institutions, TAFE and other VET providers and universities. Overall, the whole funding system doesn't work. If you were starting from scratch, I'm not sure you would have the states fund vocational education and the Commonwealth fund higher education. I don't quite understand why we do it that way. I wouldn't do it if I were starting from scratch. There's a lot of work to be done in looking at how it all works together and starting afresh, because we need change.

Dr Schultheis: I concur. Government definitely plays a role in trying to determine what those skills are and, as I mentioned earlier, to foster that collaboration between the industry and the university sectors. The education sector isn't seamless from secondary to higher education. It's not all that clear how each of those learning experiences build on each other across that journey that a student has. Like David said, if you were redesigning it now, would you design what we have? The answer's probably no.

CHAIR: Thank you very much for that and for wrapping up what's been a very interesting day. That concludes today's proceedings. I thank all the witnesses who've given evidence to the committee today. Thanks also to Broadcasting, Hansard and the secretary for your work in helping us. I declare the hearing adjourned and will see some of you in Melbourne tomorrow.

Committee adjourned at 15:42