

Transcript

Title: Swinburne International Webinar Series: Civil and Construction Engineering

Presenters: Venus Liao, Prof. Hussein Dia

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Venus Liao

Good afternoon, everyone. Welcome to Swinburne Webinar Series on a Friday afternoon. My name is Venus Liao. I'm the regional recruitment manager from Swinburne University. I'm responsible for Australia onshore and New Zealand region. I hope you are all well and healthy.

Thank you for joining us today for virtual training on Swinburne Civil and Construction Engineering. This is part of the Swinburne Webinar Series and running from the month of May to July. On your right hand side is the panellist for today's webinar, Professor Hussein Dia, department chair of civil and construction engineering from Swinburne university. Today, we'll be hearing from Professor Hussein Dia talking about Swinburne engineering programs, how this discipline has been impacted by COVID-19, and how we, as a university, preparing our students to deal with this climate and future scenarios.

We will also be talking about projection on emerging jobs in this field in a global context. If you have any questions during the presentation, please leave your questions in the Q&A box down below. At the end of the webinar, we will go through your questions together. If we can't answer your question today at the session, please feel free to contact either Mahdi from Faculty of Science, Engineering, and Technology, the International Recruitment Manager, or your Regional Recruitment Manager's from Swinburne University. Without further ado, I would like to introduce today's presenter, Professor Hussein Dia, department chair of civil and construction engineering from Swinburne University. Thank you, Hussein.

Hussein Dia

Thank you, Venus. And hello, everyone, whether it's afternoon or morning in your area. And welcome to this information session on civil engineering. My name is Hussein Dia. And I am the head of department or chair of the civil engineering and construction at Swinburne University.

So over the next 15 to 20 minutes, I would like to take you through some information about civil engineering-- what is it that we do, why students choose civil engineering, what are the career opportunities in a post COVID world-- and then take you through and share with you some information around the civil engineering at Swinburne, our learning and teaching approach, and to conclude with why study at Swinburne.

So what is Civil Engineering? Civil engineering is all around us. It is part of our daily lives, from the homes where we live to the offices where we work to the transport systems we use to the

infrastructure that we drive and then walk on. Civil engineering is a big part of the modern world. And as civil engineers, we plan, we design, we build, and we operate and maintain the infrastructure that we need for our cities.

And in civil engineering, we have a number of specializations. Our students, once they graduate, they can work as a structural engineer to design buildings, for example, as a construction engineer, to build geotechnical to deal with tunnels and anything underneath the soil, transportation engineers to design mobility systems, water engineering for dams, and, of course, architectural engineering and facade engineering. Our students, our civil engineers today are powered by not only the theoretical and technical tools, but also by imagination and a desire to work with the built environment and produce structures that are sustainable and resilient and last for generations.

Civil engineers also, today, combine the use of digital tools and digital innovations in order to basically provide a link between humans and technologies so that we are working in tandem rather than against nature, for example. All our projects have a focus on sustainability in mind and to help, essentially, help people connect.

But to me, I think, the most important part is why choose civil engineering or why do we do it? I think civil engineers have a passion for improving the quality of life for the communities where they live by designing safe and resilient infrastructure. When we ask people, you know, what is it you want out of the roads, the buildings, they say we want something that is resilient, something that will work every day. And this is what civil engineers do. For example, when we build a bridge, like this example here, in some of the developing world, when we build a bridge between two communities, to us, it is much more than just the physical bridge. It is a means for people to access jobs, opportunities, education, and services in their communities. Essentially, it is about improving the quality of life for people.

So let's have a look at the opportunities going forward for civil engineering. And most of these you will find as we go throughout are-- you know, basically concentrated around cities and around infrastructure and around creating connectivity in the world cities. So today, if we look at the cities around the world, they're, as it says on the slides, they're really a big part of the global economy.

If you look at London and New York, alone, they represent 40% of the global market capitalization. Going forward, 600 cities are forecast to generate 58% of the global domestic product around the world. But at the same time, these cities face major challenges. Today, they make up 2% of the world's surface. They accommodate 54% of the world's population. They consume 75% of the resources. But they're also responsible for 80% of the emissions and pollution. And as you can see, cities around the world are still struggling and suffering from a large number of challenges, which future generations of engineers will have to tackle.

So let's look at some of the future demand studies that we see and especially demand for infrastructure and civil engineers. So this particular organization from Switzerland estimates that in the next 30 years, the world will need to construct the same amount of infrastructure as it has done in the previous amount of time. And basically-- or 150 years. But basically, all of this means, because of rapid urbanization, aging infrastructure around the world, and also population growth, this will all

contribute to the rising demand for infrastructure services, which will need to be built by future engineers.

So today, for example, we see that construction spending around the world accounts for 15% of the global gross domestic product, or this is equivalent to US \$11.5 trillion. This is expected, as you can see in this diagram, expected to grow to around 19% of the global domestic product by 2035. And this is expected to accelerate in the post coronavirus recovery phase. If you look around the world, most of the stimulus packages being offered by governments have infrastructure built in. Because it is important for moving the economy and rebuilding [INAUDIBLE].

What's really exciting as well as we look at 2030, 2040, 2050 is that we don't know what the future form of infrastructure will be. 75% of the infrastructure we're going to need by 2050 does not exist today. And most of it is going to be something like we haven't seen before. It's going to be transformative. And this would require a new generation and a new breed of civil engineers who have access to different tools and have a global agenda, as well, and are global citizens.

An example is, you know, the trillion dollar Belt and Road Infrastructure. This isn't just going to transform communities and societies and cities along its path. It's going to create a large number of smart cities, which will need to be built by future engineers.

Now this is another interesting observation is that today, as we mentioned before, governments are spending around \$11.5 trillion a year on infrastructure. But in order to meet the UN Sustainable Development Goals by 2014, it is expected that the world economy needs to inject an additional \$97.5 trillion in infrastructure. And as you can see, this is global. It goes North America, Europe, Asia, Southeast Asia, and so forth. So this is just shows you the huge demand for civil and construction engineers going forward.

More closer to home, in Australia, according to the job outlook from the Australian government, civil engineering is a skill in demand. It has a strong future growth, very low unemployment rate, and results in very high skill workforce. Gives you an example about the weekly pay today for civil engineers and also the construction managers. I'll show some slides as well, too, later on, to show you how our students are doing as well in the job market.

Now a little bit about civil engineering at Swinburne University of Technology in Melbourne. We are ranked in the top 100 in the world. We ranked 76 globally according to the World Ranking of Academic Subjects in 2019 and ranked 42 second globally according to the US News World Education report, also, last year. This really puts us in the same league as some of the top universities in North America and Europe and elsewhere.

Our point of difference is a practical curriculum that is developed in partnership with the industry. Our Civil Engineering program has a course advisory committee that is made up entirely by industry professionals who help us and guide us in the development of our curriculum. We have, as I'll show you later, we have world standard facilities. And also, we offer work integrated learning. And our students have high employability rate upon graduation.

In undergraduate degree, we offer either Single degrees or Double degrees. We have a Bachelor of Engineering Professional, where international students are qualified to take this where it includes a

12-month paid and guaranteed professional placement. And we also have the single Bachelor of Engineering degree in either a Civil or Construction or Architectural engineering major. And then another popular feature of our offering is double degrees, where we have Bachelor of Engineering combined with Business, Computer Science, or Science or other art, for example, Business, or Bachelor of Law.

So what's the difference between the three disciplines? Civil engineers are mainly interested in the design of structures and also in construction management. The construction engineers are more focused on the construction management side of things, while the architectural engineers are more focused on the design. As you can see, all three major disciplines do the same things, but a little bit of focus or different point of focus across each major.

With regard to higher degrees, we offer graduate certificates and diplomas in a number of areas. Construction and Risk Management are very popular. But we also offer Civil and Structures graduate certificates. And also we have, in the post graduate, offering Master of Engineering degrees, for example, Civil or Construction Management. And also, we have, of course, our Higher Degree Research, either leading to a Master of Engineering by Research or a Doctor of Philosophy.

Now our learning and teaching approach sets us and is a key differentiator for us. Our students learn the technical and management skills that are required to plan and build infrastructure. But at the same time, we combine engineering theory with industry needs. We are a University of technology. Our focus is very, very practical. And as you can see, we deal with a large number of companies, as you can see in this testimony.

Very quickly, our program is very well structured. We start with a common first tier. And then our students need to complete 400 credit points. Everything you see in dark blue is what we call a Core Unit. Everyone has to do it. And then the light blue is where students start to select majors. For example, this is for the Civil major. And then also, the yellow parts is what we call Electives or Minors that the student can engage in.

The student engineering experience, there are two ways we evaluate this. There are surveys that are done internally and surveys that are done by government externally. Our internal evaluations, for example, when we survey our students who are currently enrolled, around 80% are satisfied with their Swinburne experience. About 84% of the graduates who complete the course, when they are surveyed, they say that they were satisfied. And 72% of the graduates have full time employment within four months after graduation.

Median salary, as of last year, for our fresh graduates was around 60,000 Australian dollars. The government also does some surveys. We are not involved in these. They contact students directly. And over the past four years, as you can see, our students have rated the quality of teaching as more than 75%, which, I should add, as it says in the first line, is actually ranked the highest level for overall graduate satisfaction in the Victorian state where we are.

Now of course, this year, we had to adapt just like many other institutions around the world. This, today, actually, is the last day of our first semester. And between March and June, we went fully online delivery using our Canvas learning management system, which includes a lot of collaborative tools for lecturers, tutorials, and practicals. We, in Australia and in Melbourne, we're starting to see

some easing of restrictions. And for our second semester, between August and November, we are planning to still run our lectures online. Tutorial sessions will be online. But we have identified essential practical sessions which we would need to run on campus. And as you can see in this diagram, this is one of our labs.

And we used to have 26 students there. But now under the physical distancing rules, we will only be able to get 12. So we are working around removing some of these barriers to allow our students to have on campus access. Our students, immediately after they enrol, would have access to our research ecosystem. And we are highly ranked in research. We have a large number of research institutes. And the ones that are mostly related to our civil engineering students is Smart Cities.

Students would also have access to our high quality research facilities. We have a smart structures lab. We have a digital construction lab. We have virtual transport modelling tools and so forth. Mainly, all of these are done through our Centre for Smart Infrastructure and Digital Construction.

So this is our Smart Structures lab. This is one of a few unique facilities in the South East Asia region. And essentially, as you can see here, this is a testing facility for earthquake engineering. Our students would need to complete a research project in the final year of their studies. And most of them would be engaged in projects using this and similar facilities across the department and the School of Engineering.

Recently, established our digital construction laboratory where we are doing 3D concrete printing. So we have robots that actually build things for us. And this is, once we have this deployed at mass scale, it's just going to change the construction industry in a profound way. As you can see here, we are now even talking about cement-free concrete. And as you can see in the lower picture there, we've recently announced a breakthrough in doing concrete that is bendable, as well, which is quite a significant innovation.

We have a construction innovation virtual research facilities-- or facility where our students would have access to virtual tools. In this example, instead of actually going on site and seeing how a building is being built, through virtual tools, you can actually imagine or you can see exactly inside the building, and if there is something that needs to be fixed.

Finally, why Swinburne? I think our key differentiator is our Work Integrated Learning. This is where students are embedded in industry-- very popular professional degree program. And as I mentioned before, students who are enrolled would be able to take a 12-month paid placement. And there are other options, including professional internships, and also industry study tours. And of course, our program is very flexible. Students can design and create their own experience.

So maybe I should just add that between 2017 and 2019, we've had 37 international students who were placed in professional placements with companies, consultants, and construction friends. Our students also have access to international study opportunities, as Swinburne has a campus instead of work in Malaysia, for example, where a lot of our students go and study. But we have agreements with over 100 institutions around the world, where students, as well, can visit and take one semester or two semester abroad.

Thank you for your time. And I hope that has given you a taste of what civil engineering is and what they do and why should future students be involved in engineering, and also, a glimpse of engineering and civil engineering at Swinburne. Thank you for your time. And I think now, if there are any questions, ask to Venus, maybe she can help me to read the questions. And we will be more than happy to answer them.

Venus Liao

Yes. Thank you, very much, Professor Hussein Dia, for a wonderful presentation on Swinburne Civil and Construction Engineering. All right. So we do have a question coming in from Tina, asking, one of the units that the student has to take is engineering management. Can you tell us what exactly the student will learn from this unit. Thank you.

Hussein Dia

All right. So this really, essentially, takes these students through the principles of project management, how to schedule a project so that it progresses on time and there are no delays. We take them through something called a Critical Path Method to help them identify what are the critical activities in their project that need to be completed on time, how to do a risk management, and risk analysis for their projects so that in case something does not go according to plan, how they can put the project back on track. Also, it has an element about cost engineering where they are introduced to the basic principles of how to do a costing of projects.

Venus Liao

Thank you, professor. I do have a question. Obviously one of our strongest industry partner for Swinburne University is Siemens. And can you tell us about the work that we do with Siemens? And also the Industry 4.0 at Swinburne University as well. Share more information with us, please?

Hussein Dia

Sure, yeah. So Industry 4.0 and Cities 4.0 are a big focus for Swinburne. And we are delighted to be partnering with some of the global technology firms, including Siemens. But also we have collaborations with Amazon. Similarly we have collaborations with Google.

Last year a major technology company invested in a new chair, a professor chair in artificial Intelligence. The name of the company is Wipro. And so we are quite focused on these digital platforms and what they offer. So Industry 4.0 is where we are introducing digitization into the engineering disciplines.

We're talking about digital engineering. We're talking about-- as I just showed in some of these tools-- how to use virtual reality. How to use the digital platforms in helping students design better facilities and better assets at lower cost.

Venus Liao

That sounds like we're talking about the future already. And we're bringing the future into the campus. Exactly matched to what will happen to the new norm, as we all adapt to.

Hussein Dia

That's right.

Venus Liao

Yes. As we're waiting for more questions to coming in, I'd just like to also bring some update that recently have broadcast at our global agent webinar as well. So at the moment, for onshore students, we do have a plan to return to campus safely and carefully by stage.

So looking for onshore students in Melbourne at the moment. For semester 2, it looks like it will be a blended teaching mode. But for students, unfortunately, have been disrupted by travel ban and also border closure from Australia, we also have introduced a very attractive study options, such as we have brought out four intake for the rest of 2020.

So the intake will be available in July, August, September and November. And we have also proudly partner with LinkedIn providing a Swinburne and LinkedIn international program offering all the students from offshore taking our programs online and will automatically receive a 30% fee reduction and also have access complementary to LinkedIn learning as well.

So if you wish to know more information about the study option in 2020 at Swinburne University, please contact your regional recruitment managers from Swinburne University. OK. Now that we have some questions coming in-- OK. So the first question is, what is the average pay scale student get after completing master of civil engineering? Professor Dia?

Hussein Dia

All right. So the undergrad is around 60K. The post-grad in some industries, it can be a good start at 100K, and in some other industries, 80. And it will also depend on the student experience.

One of the things we noticed with our post-grad intake, especially international students, some of them do come with significant-- you know, five year, for example, experience after their first degree. And the more experience, the higher the pay rate.

Venus Liao

Thank you very much. And this question-- I think I will take this question. Is University accepting Duolingo test for entry to bachelor and master program? So the answer is, at the moment Swinburne University accept Duolingo, LinguaSkill, PTE and TOEFL iBT home edition for courses for pathway programs in undergraduate program at Swinburne University.

For master programs, we accept PTE and TOEFL iBT. And on top of all this, there is a [INAUDIBLE] test also we call that English placement test available from Swinburne University as well. So if you are not aware of the option, or you would like to hear more information about it, you could contact the regional recruitment managers from Swinburne.

OK. And just again, Swinburne has also recently advised an update on our newly updated at Swinburne International Excellence scholarship, offering scholarship ranging from 10% up to 75% fee

reduction. So according to students' [INAUDIBLE] score, from 60 all the way to 95. We are targeting also high-achieving students.

So if you are not sure what's the requirement for Swinburne International Excellence scholarship, contact your regional recruitment managers, Wendy, Karen, Michelle or Raj from Swinburne international recruitment team. All right.

There's one more question coming in. Asking, are students allowed to work part-time during their studies? OK. So I'll take this question, professor.

Hussein Dia

Sure.

Venus Liao

Yes. So students undertaking Australian student visa will be allowed to work up to 20 hours per week during semester. It will be unlimited during semester break. So we do want to encourage and remind the student to adhere their visa conditions. And if they are unsure, the best way to check is with the Department of Home Affairs website.

OK. We'll be taking the last questions here, as we are hitting 2:30 mark. Can offshore students applying for package course of English and bachelor of engineering professional? Good question. So as Professor Hussein Dia has mentioned during the presentation, that professional degree is also available for international students. It is available for them only if they have completed year 12 in Australia.

So we're looking at onshore, international and domestic students with a VCE or equivalent qualification. And students thus require a task of at least 80 for entry into our professional degrees, but 85 for engineering on this professional degree, which will be a five-years course duration.

For students coming from offshore, they could apply for entry into a standard bachelor degree. And by meeting some of the criteria, it is possible for them to have internal transfer from a standard bachelor degree into a professional degree within their courses. So it's possible, and we did have students coming from a standard bachelor degree end up transfer to a professional degree, also getting paid placement at Bosch Australia and other industry partners' companies as well.

So I hope that answers your question. OK. So if you do want to know about the average salary for part-time work for international students, one of the best way to find out is to check on Seek.com. It's a job-seeking website from Australia. And it will give you a better understanding of the current wage outcome and also in specific industry and position.

So thank you once again for tuning in for today's session. And thank you for Professor Dia, for your presentation on Swinburne civil and construction engineering. Today's presentation will be emailed to all participants after the webinar. The recorded video will also be available on YouTube upon notification.

So I hope you can join us, our next webinar on next Wednesday, 10th of June, on robotics, electrical and electronics. The invitation will be sent out to you all today. Hopefully to see you next

Wednesday at 2:00 p.m. Thank you, and have a nice weekend, everyone. Enjoy the long weekend for those in Australia celebrating queen's birthday. Take care. Goodbye.

Hussein Dia

Thank you. Bye, bye.

[END OF TRANSCRIPT]