12 May 2023

Submission to the Diversity in STEM review

Second round of questions: let's talk solutions

Thank you for the opportunity to provide a response to the Department of Industry, Science and Resources' *Diversity in STEM review* (Round 2: let's talk solutions).

This submission is from the perspective of an organization that supports and employs STEM professionals – technology professionals in particular. We have a relatively diverse workforce in terms of age, culture, ethnicity, gender and language, but we are keen to raise the bar even higher – not just because it is the right thing to do, but also because it makes good business sense.

Because of this, we are passionate about the role of education, starting in primary school, to generate wider interest in STEM careers, prevent stereotypes taking hold, and ultimately grow the pool of locally produced STEM professionals.

We believe that increasing diversity in STEM (and ultimately in our workforce) has two fundamental business benefits for us an employer:

- diverse teams bring a more well-rounded approach to problem solving – helping to identify and break down biases and assumptions
- bringing a wider range of people into STEM careers will help expand the much-needed STEM talent pool to support Australia's vision to become a leading digital economy.

Aligning policy priorities and targeted government investment into extending and enhancing digital literacy capability across Australian primary and high schools is essential to attract a broader range of people to the industry, and build a strong pipeline of talent that will be critical for Australia's future economic prosperity.

About WiseTech Global

WiseTech Global (ASX:WTC) is the leading developer and provider of software solutions to the logistics execution industry globally and is one of Australia's most successful technology companies. We grew from, and remain headquartered in, Australia. We directly employ approximately 3,000 people, many of who are software engineers, product managers and creative problem solvers. More than 57% of our global employees are engaged in product development, with a large portion of our team located in Australia and focused on software engineering.

Our customers include more than 18,000 of the world's logistics companies across 173 countries, including 43 of the top 50 global third-party logistics providers and 24 of the 25 largest global freight forwarders worldwide[1].

Our mission is to change the world by creating breakthrough products that enable and empower the supply chains of the world.

Almost one third (29%) of all WiseTech employees, and 20% of our employees in technical roles, are female. Like others in the sector, WiseTech wants to increase female representation in technical roles. However, regardless of how welcoming and supportive our company culture is (and it *is*), to recruit more females we need more females to join the talent pool to hire from. Key to achieving this is breaking social biases about what is appropriate or desirable for girls to study – starting in primary school and early secondary school – as this can shape what subjects they elect to study in later years.

We have invested in three key initiatives to attract more people to STEM careers - particularly software engineering:

1. **School:** WiseTech pledged 1% of its annual pre-tax profit to enable tech education initiatives that develop technology skills and passion for creatively solving real-world problems in school-age children. Partnering with Grok Academy for an initial five-year period, the funds will enable all Australian K-12 students to enhance their digital technologies experience with the aim of encouraging more students into IT careers and helping Australia produce its own tech workers. This contribution has enabled the Grok Academy online platform and classroom resources to be available free of charge to all K-12 students, teachers, parents and adult learners across Australia from 2023. Removing this cost barrier has already had an impact to increase access to, and use of, this learning content. In January to March 2023 there are: 66% more unique student enrolments; 47% more teacher enrolments; and 47% more schools using the platform compared to the same period last year.

2. **University:** In 2023 we commenced an 'Earn and Learn' WiseTech-funded program, initially available to computer science/software engineering students. One-third of the first cohort of 'Earn and Learn' students are female - that's twice the proportion of women in STEM-qualified occupations in Australia[2]. But we want to push that bar even higher as we expand the program in future years via targeted recruitment toward female high school students. Under the minimum four-year program, each student receives a competitive salary, reimbursement of university course fees upon meeting certain criteria, an annual grant of share rights in WiseTech as well as access to a range of employee benefits including mentor programs, learning platforms,

[1]Armstrong & Associates: Top 50 Global 3PLs & Top 25 Global Freight Forwarders ranked by 2021 gross logistics revenue/turnover and freight forwarding volumes – Updated 20 September 2022

[2] Department of Industry, Science & Resources STEM Equity Monitor – women accounted for 15% of STEM-qualified occupations in 2021.

personal wellness tools and flexible work practices[3]. Most importantly, students gain two very unique benefits: a uniquely tailored program designed to address retention issues that particularly affect women in tertiary education and early careers in STEM; and, the opportunity for students to take the skills they learn in the classroom and repeatedly apply that knowledge to real work business problems in a fluid and consistent way.

3. **Adult Learning:** Additionally, we created, and have aggressively grown, the WiseTech Academy, an Australian Registered Training Organization (RTO) to train, upskill and cross train mid-career adults and graduate students in valuable and in-demand industry skills. As part of the 'Earn and Learn' program, participating students will take some of their undergraduate subjects through the WiseTech Academy. The WiseTech Academy has been operating for some years, has a highly developed set of training programs and is already training and certifying thousands of customers, staff, and students in advanced technical skills and logistics industry certifications.

These initiatives form part of our approach to tackle the short-, medium- and long-term needs of the technology sector by expanding the intake of students into technology education pathways at every level and from a broader range of the community.

Q1: What solutions will increase diversity and inclusion in STEM?

Early intervention – starting in primary school

While there is a lot of focus from government and the business sector on building Australia's STEM talent at tertiary level as well providing reskilling, upskilling and cross-skilling opportunities for adults, we firmly believe that to attract more diverse people to this industry, we need to intervene much earlier in the STEM talent lifecycle. There is significant evidence that points to educational issues, preferences and social biases that divert young, particularly female, students away from STEM and from high-paying careers in technology. A critical way we can help solve this problem is to start in early primary school and continue through to high school, to encourage students to preference STEM, rather than wait for late high school when young people have already chosen their career pathways (potentially without any meaningful exposure to STEM subjects before then).

What students experience in primary school, and early high school, strongly influences what they elect to study later in life. We need to create positive experiences in primary school, and high school, that educate and inspire our youth into STEM and technology familiarity, and allow them the ability to access rewarding and economically valuable

[3] Salary is on a full-time equivalent basis with actual salary based on days worked at WiseTech Global. Reimbursement of course costs is based on level of academic performance for each subject, in line with WiseTech's Further Education Assistance Scheme as amended from time to time. Share rights are a right to acquire WiseTech global shares and are subject to our Equity Incentive Plan Rules and the relevant offer document for each grant.

tech-focused careers. This is a key reason for WiseTech's financial support of the Grok Academy – to make such experiences readily accessible to as many K-12 students in Australia as possible.

It's important to note that to effectively engage young people in technology requires repeated exposure to rich experiences that are diverse and of growing complexity, as well as opportunities to build independence and to see STEM as a valuable part of their lives today and in the future.

There is also a critical need to specifically encourage girls and young women to study STEM and in-demand technology subjects. While all genders need to enjoy a subject to want to spend more time doing it, young women also should be given the opportunity to see that it is a skill or profession which is for them and has a culture they want to be a part of. We must proactively work to break lingering social biases about what is appropriate or desirable for girls to study - these biases are embedded in very early experiences and so dispelling them must start in early primary school.

To hire more women in IT we need more females to want to join the technology-focused talent pool. More girls than boys go on to tertiary studies, yet 73% of students studying in the STEM field are male and the results are even more skewed toward males when we look at what have been traditionally described as the hard sciences and deep technical talents[4]. Ensuring all students, regardless of gender, economic circumstance, or geography, have a positive STEM and technology skills experience at an early age, will inspire more students to embark on further technology studies and careers.

Q2: How can efforts to increase diversity and inclusion in STEM be better and have more impact in future?

Arm teachers with effective, easy to deliver digital course content and resources

Fundamental to increasing diversity and inclusion in STEM is providing equal opportunity for all students to receive high-quality digital skills education in a way that sparks interest and passion about the world of creativity and opportunity available in a digital career. The content needs to be fun, relevant and creative so that they choose to engage with it. And it should start in primary school and continue through high school.

There is already a lot of focus on supporting digital tech study at the tertiary level and reskilling adults. These are worthwhile initiatives – and WiseTech supports such programs ourselves through our 'Earn and Learn' program and adult education via WiseTech Academy. However, if we truly want to make a significant impact, we need to solve the root cause of the problem: How do we get more school students to want to

[4] Australian Bureau of Statistics report: Education and Work, Australia, May 2021

study STEM? How can we prevent them losing interest or opting out? And how can we support teachers and parents to ensure all students are aware of the career opportunities open to them?

Key to this grass roots approach is investing in standardized coursework, especially in STEM and digital skills, and providing much needed resources to support all teachers to deliver an engaging and valuable experience for students. Many teachers are expected to teach skills that they did not learn themselves. Only 26–50% of Australian primary school teachers and 52–69% of high school teachers consider themselves proficient at teaching computer education[5]. And in 2022, prior to Grok Academy materials being made available free of charge, only 20% of teachers said their school had a comprehensive bank of ready-to-use, high-quality instructional materials[6].

To take the pressure off teachers, and ensure all students experience engaging digital skills learning, government and industry must invest in a suite of high-quality interactive digital skills content to arm all teachers and schools with the tools to deliver a compelling learning experience for their students.

WiseTech and Grok Academy have had a long relationship, through the National Computer Science School (NCSS) challenges for years 5 and up, and the 10 day computer programming summer schools for years 11 and 12. But we've only touched the tip of the iceberg. We want all students across Australia to have the chance to learn digital skills.

Grok Academy's Learning Platform delivers an online learning experience that provides teachers with the resources needed to enable engaged learning. The platform gives students from all socio-economic backgrounds the opportunity to build their digital literacy skills in an interactive and holistic way.

WiseTech has committed to contribute 1% of our annual pre-tax profits each year to Grok Academy initiatives, over an initial period of five years. As referenced above, this contribution has enabled the Grok Academy Learning Platform to be made available free for all Australian students, teachers, parents, and adult learners from 2023.

Australia's industry, particularly the technology industry, and government at all levels need to do more to encourage STEM and technology interest. There must be continued investment in structured learning programs to help attract, engage and build the technologists of the future.

This means continuing to invest in, and build on, the Digital Technologies Curriculum and provide high quality STEM content to support teachers with the learning tools that will enable them to successfully build a strong pipeline of interested young Australians that will enter further tech studies and future tech careers.

[5] ACS report: Computer education in Australian schools 2022 Enabling the next generation of IT professionals – p12
[6] Grattan Institute survey on curriculum planning and materials

Q3: What would you like to come out of this Review?

Develop a national approach to a digital skills curriculum

Australia's education system is at a crossroads. Our children are already living in a digital world and yet much of our education curriculum was developed decades ago and is still, in many cases, left to the individual teacher to develop coursework and related formative and summative assessments. Education to support a digital future cannot be built on analogue parts. A new high-quality content led approach to STEM education is needed to enable and empower teachers and build our nation's tech future.

Our current state-based approach to the curriculum is disparate and provides teachers high-level direction only, leaving teachers with large gaps to fill in[7]. Teachers are under pressure to deliver coursework for which they may have little to no skills or prior knowledge.

Our contribution to the Grok Academy is aimed at beginning to solve this problem. Dr James Curran, CEO of Grok Academy, was a contributing author of the Australian Curriculum: Digital Technologies and consults with curriculum authorities around Australia. The Grok Academy Learning Platform provides a single source of teacher resources and materials that allows teachers with minimal knowledge to deliver highly valuable digital skills coursework to their students through the learning platform.

This is a solution that is focused on the future. It will help to take unnecessary pressures off teachers by providing high quality, readily accessible STEM and digital skills content and using technology, platforms, and content to deliver aspects of STEM and digital skills training from primary school through to high school.

We call on government at all levels and industry to support the creation of a national approach to a digital skills curriculum, for lasting long-term benefit to all.

[7] Grattan Institute: Ending the lesson lottery report: How to improve curriculum planning in schools, October 2022

Q4: Is there anything else you'd like to tell us?

Increasing diversity in STEM makes good business sense

Currently, there is not enough local tech talent available. Rather than fight each other in the 'tech talent war' to hire graduates or poach employees, we need to work together and intervene earlier in the talent pipeline to attract more students to tech careers. It is time for businesses to step up to help teachers deliver necessary STEM education – starting at primary school – so that more students, regardless of gender, ethnicity, sexual orientation, cultural and socio-economic background consider and choose a digital tech career.

As one of Australia's most successful technology companies, choosing to base our global headquarters in Sydney and retain our Australia-first approach, we need a strong pipeline of skilled and talented permanent Australian residents with technology skills, especially in software engineering and related management and product development areas. Despite WiseTech's highly attractive employment, culture, employee share plans and compensation, there is extreme competition for a very limited supply of candidates and a constant battle for retention of talent for small and large businesses across the industry.

The very limited local supply of talented engineers, especially software engineers, and extreme demand for this talent creates a dysfunctional and economically damaging battle for tech talent between Australian-based and global businesses. As a nation, we need to create a much larger pool of locally created talent that will benefit Australian business growth and satisfy the exceptional demand. Such demand for key engineering skills is likely to continue as the need for more technology and increased productivity drives our economy into the future.

The other business benefit of increasing diversity in the tech professional talent pool is that it allows employers to create more diverse teams, which ensures problems can be tackled from a range of perspectives to develop the best solution possible. It helps to break down unconscious biases both in how colleagues interact and in the assumptions applied to problem solving. Ultimately, this leads to better solutions.

If we are to be a leading digital economy and society by 2030, as set out in the Australian Government's *Digital Economy Strategy 2030*, we must do much more and focus much earlier to engage and encourage young students towards studying and choosing a career in STEM.

The Committee for Economic Development of Australia notes that, while Australia's overall digital competitiveness ranking has recently improved, we still rank 52nd out of 63 for graduates in science[8], suggesting that "Australia's Achilles heel is its future readiness

[8] Committee for Economic Development of Australia (CEDA) World Digital Competitiveness Ranking 2022

which underpins a country's ability to take advantage of emerging technologies, sustaining its digital competitiveness over time to keep pace with the most digitally competitive nations". In other words, we run the risk of falling further behind other global competitors, to the detriment of the Australian economy.

There is an opportunity and a need for industry and government at all levels to work together and strongly message to the nation the benefits and stability a career in technology brings across a wide range of industry sectors[9].

Conclusion

The Australian Government and the Australian tech sector share a commitment to achieve 1.2 million tech jobs in Australia by 2030.

According to the Tech Council of Australia, Australia will need to employ an additional 653,000 tech workers to meet this goal[10]. Tech jobs provide Australians with a well-paid, rewarding, and flexible career. Tech jobs are also among the most productive in Australia, with productivity growing at four times the rate of the market sector as a whole in the decade leading up to the COVID-19 pandemic. And they span a wide range of vertical industries.

Proactively increasing the diversity of people who choose STEM careers helps create teams that can solve problems more effectively, expands the number of professionals available to support Australia's digital future, and makes exciting STEM career pathways accessible to more people – regardless of their background. It's simply good business sense.

In a future where digital literacy is no longer separate from general literacy, there is a responsibility for all of us to take action now to ensure the future prosperity and productivity of our country and people. A key step is to increase the diversity of STEM professionals.

Thank you for the opportunity to provide feedback. We welcome further discussion.

Yours sincerely,

Richard White
CEO and Founder

WiseTech Global
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[9] ATSE report: Our STEM skilled future: An Education Roadmap for an Innovative Workforce October 2022
[10] Tech Council of Australia report: Getting to 1.2 million Our roadmap to create a thriving Australian tech workforce