Deloitte.

Accelerating to meet escalating demand
The Australian EdTech
Market Census 2019

February 2020

EduGrowth conducted the Australian EdTech Market Census in 2019. With the data collected through that Census, EduGrowth and Deloitte have collated the findings into the insights and related commentary found in this report.

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Executive summary

Population growth and skills are driving exponential demand

Population growth in developing markets is driving a mass expansion in, and demand for, education services. At the same time, digital disruption in developed economies is driving unprecedented reskilling and upskilling, which in turn is also driving demand for rapid innovation and the scaling of education services targeted toward emerging industry needs.

EdTech offers a solution to this demand

EdTech refers to the application of technology across the education value chain: from the discovery of learning through to completion and credentialing.[1]

Most solutions address the specific needs of learners, employers or education providers; while others seek to enable better connections between these three groups. However, EdTech also extends beyond learning, with solutions to support researchers and administrators of educational services.

EdTech innovations have the potential to transform education through advanced technologies such as AV/VR; AI; robotics; and blockchain. These technologies can better connect education with the learning needs of student and employees, and they can do so at speed and at scale. For example, innovations such as AI-enabled hyper-personalisation allow teachers and trainers to better cater to the specific needs of their individual students.

Investment is concentrated in future of work solutions

Future of work solutions are garnering the highest levels of investment both globally and locally.

Good examples are G01, which provides a marketplace of training options connecting employers and training providers, and A Cloud Guru, which provides cloud computing training to help organisations train employees and transition to a cloud-based environment.

In 2019, these two Australian based organisations raised the largest levels of funding (through funding rounds) that the Australian EdTech sector has ever seen[3].

Global markets are growing

The global market for EdTech is rapidly expanding, with forecasts predicting that expenditure on EdTech will reach $341bn in 2025.[1] Recognising the opportunity, investors are keen to participate. Global venture capital investments in EdTech reached $7bn in 2019, up from $500 million in 2010.[2]

In the context of this global growth and the evolution of the EdTech sector, EduGrowth launched the Australian EdTech Census in 2017. The Census seeks to map the landscape, track progress, and identify ways to help foster innovation in the EdTech sector.

The 2019 Census aims to identify how the sector has evolved over the last two years. The Census has a total of 168 respondents, which represent just over a quarter of the estimated total EdTech organisations in Australia (based on EduGrowth estimates).

Australia's EdTech sector has

momentum, but we need to do more

The Australian EdTech market is maturing. Between 2017 and 2019, the Australian EdTech sector grew significantly, almost doubling in size. Over this period, a greater number of EdTech organisations have also progressed from 'start-ups' to 'scale-ups'. The key features of a scale-up are that they have progressed from concept to the delivery of one or more education services. They also have established customer bases and ongoing monthly revenue streams.

This is simultaneously encouraging and insufficient: to compete in an increasingly innovative and competitive global education market, we must do more in Australia.

China made up 53% of the last decade's EdTech funding, the US made 33% followed by Europe and India at around 5% each. Australia is one of the countries in the 'rest of the world' category that makes up the remaining 5% of global funding. Similarly, of the 14 global EdTech unicorns (with a market valuation over $1 billion), all are based in the US, China and India[3].

We have a well-funded sector in Australia in keeping with our size and scale, but if we want to be part of the future we must collaborate to further stimulate, support and scale local EdTech initiatives. Businesses, education providers and policy makers all have a role to play to help Australian organisations prosper, and to ensure our EdTech sector continues to grow.

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[1] https://www.austrade.gov.au/edtech/lets-call-it-edtech/.

[2] Holon IQ (January 25, 2019) Global EdTech Market set to reach $341billion in 2025 referenced at https://www.holoniq.com/topics/ar/global-education-technology-market-reach-341b-2025/

[3] Holon IQ. (2020, January 28). $87bn+ of Global EdTech funding predicted funding predicted through 2030. Retrieved from https://www.holoniq.com/notes/87bn-of-global-edtech-funding-predicted-to-2030/

[4] Navitas Ventures (2019, August 9) Scaling up: Investment flows to growing Australian EdTech companies. Retrieved from https://blog.navitasventures.com/scaling-up-investment-flows-to-growing-australian-edtech-companies-c957078fcd39?gi=2859227d159e

Survey context and methodology

EduGrowth is Australia's education technology (EdTech) and innovation industry hub; facilitating connection and collaboration among the EdTech industry locally and globally. EduGrowth launched in 2016, with the aim of driving innovation and technology use across the education sector. It is supported by education providers[5] who believe that Australia has the market leading expertise, and collective ambition, to become a world leader in the business of education technology.

At its core, EduGrowth is a national not-for-profit peak body whose vision is to transform global communities by enabling the growth of Australian EdTech. Conscious that the Australian EdTech market has a vibrant and thriving community of tech start-ups, EduGrowth launched the Annual Australian EdTech Market Census in 2017 to map the emerging landscape, track the ongoing evolution and performance of the Australian EdTech market, and better inform founders, investors, education providers and governments on ways to more effectively and efficiently foster innovation.

The Australian EdTech Market Census 2019 aims to refresh 2017 findings regarding the Australian EdTech ecosystem, and capture the impacts that policy, technology trends, and the changing nature of work are having on the EdTech sector.

The 2019 Census surveys education technology start-ups within Australia who are currently running an EdTech company. It also includes individuals and teams with an idea for an EdTech start-up that they plan to launch in the next 6 to 12 months. The perspectives of individuals and teams that are not part of an EdTech organisation, but who are involved in the EdTech sector, are also captured. (Figure 1).

It is estimated that Australia has approximately 600 EdTech organisations servicing the entire education ecosystem[6], giving the sample size of 116 start-up respondents (running an EdTech start-up as opposed to having an idea for an EdTech start-up) a confidence level of 95% with a confidence interval of 8.

The 2019 EduGrowth Australian EdTech Census findings in this report demonstrate that Australia has a dynamic and evolving EdTech industry. EduGrowth would like to take this opportunity to sincerely thank all the participants that took part in the survey, their founding members and the entire EduGrowth community. Each and every participant's continued involvement has provided insights across a number of topics, and has highlighted key trends across the sector.

Figure 1: Survey respondent type

69% of the respondents are running an EdTech company

13% of the respondents have an idea for EdTech company

18% of the respondents are not an employee or founder of an EdTech company

168 respondents

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[5] IBIS Capital and EdTechXGlobal. (2016). *2016 Global EdTech Industry Report: A Map for the Future of Education.*

[6] EduGrowth. (2019). *Enabling the growth of the Australia EdTech ecosystem.*

1 Role of the Australian EdTech market

Since the last Australian EdTech Census in 2017, digital technologies have become increasingly critical to the Australian economy. Forecasts indicate that digital technologies can deliver $315bn in gross economic value over the next decade[7], and an overall contribution to GDP that the Australian Computer Society and Deloitte Access Economics[8] estimate represents growth of 40% between 2018 and 2023. This translates to an extra $2,500 per person per year in Australia, and a host of qualitative benefits in an uplift of living standards and quality of life for the whole country.[8]

But what specific role does the Australian EdTech market play within the broader context of digital technologies? And why should we be especially attentive to ensuring that Australia has a thriving EdTech sector?

A critical enabler and differentiator of our third biggest export

Education services underpin economic, social and financial prosperity in every country in the world. Here in Australia this particularly important, as education services are, at the time of writing, our third largest export. The Australian Bureau of Statistics reports that total expenditure associated with the Education Services represented $34 billion in 2018 to the local economy[9], fuelled by a thriving education market that continues to grow.

Deloitte Access Economics predicts that there will be 1 billion students across 29 global markets by 2025[10]. That's half a billion more school and university graduates in the world than today. To meet this additional demand, the education sector will have to achieve significant additional scale; scale that cannot be met by incremental efforts alone.

In this context, EdTech will be critical to help meet increased demand for education, while simultaneously enhancing education services.[10]

In all aspects of education delivery, it is increasingly difficult to differentiate learning and teaching from wrap-around support services. For example, AI-enabled hyper personalisation can help teachers and parents cater to the specific needs of the student and child and, research capabilities are increasingly intertwined with research platforms.

Whether an enabler, or an education service in and of itself, Technology is now a critical differentiator in the provision of education. In China, where demand for education far exceeds teaching capacity, the Government has released a roadmap for the increased use of AI in education. This is aligned with broader aims for China to become a world leader in AI by 2030, but is specifically seeking to use advanced technology as a means to overcome teaching capacity constraints.

Importantly, AI in education is not just a priority for China: almost 20% of all global EdTech investments last year involved AI (a significant increase from 4% in 2016).[11]

To continue to compete in the global education services market with innovative, modern, scalable and effective services, a thriving EdTech sector is a necessary pre-requisite.

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[5] IBIS Capital and EdTechXGlobal. (2016). 2016 Global EdTech Industry Report: A Map for the Future of Education. (CHANGE FOOTNOTE NUMBERED 4 to be 5)

[6] Data61 and AlphaBeta. (2018). *Digital Innovation: Australia's $315B Opportunity.*

[7] ACS. (2019). *Australia's Digital Pulse 2019: Booming today, but how can we sustain digital workforce growth.*

[8] Australian Bureau of Statistics. (2019, December). *International Trade in Goods and Services, Australia (Catalogue no.5368.0). Retrieved from http://www.abs.gov.au/ausstats/abs@.nsf/mf/5368.0*

[9] Austrade and Deloitte Access Economics (2015) "Growth and Opportunity in Australian International Education

[10] HolonIQ. (2018). *Global EdTech Startup Activity. Retrieved from https://www.holoniq.com/global-edtech-activity/*

A globally relevant investment opportunity

EduGrowth estimates that there are now 600 EdTech organisations in Australia, and the 2019 Census shows that a significant number of these organisations have progressed from start-ups to scale-ups since 2017. They now have greater revenue, more overseas customers, and more learners on their platforms.(see Section 2 for more details).

Although funding and investment receives less emphasis from survey respondents in 2019 (when compared to 2017), a third of those surveyed see raising capital as a challenge and a priority. This represents a clear opportunity for investors, with the Australian EdTech sector characterised by high-potential organisations that are capturing international customers in a lucrative and growing global market.

Despite the potential of Australian EdTech organisations, very few Venture Capital firms specifically focused on EdTech locally. Accordingly, there are untapped opportunities to invest in a growing sector that will have global reach.

And a creator of jobs

In a labour market that is changing due to rapid economic restructuring, domestic EdTech organisations offer an important source of job creation as they grow and mature. The EdTech Census forecasts significant jobs growth in the Australian EdTech sector, with the majority of organisations planning to hire in the next 12 months and 18% citing finding talent as their biggest challenge in 2019.

18%
see finding talent as one of their **biggest challenges** in 2019

33%
intend on **raising capital** as a focus in the near future

2 What does the Australian EdTech market look like today?

Moving from start-ups to scale-ups

EduGrowth estimates that the number of Australian EdTech organisations has increased from 350 in 2017 to 600 in 2019.

The results of the 2019 EdTech Census indicate that the market has also matured. Australian EdTech organisations are on average more established, and more operationally sustainable, than they were in 2017.

The proportion of respondents reporting less than $15,000 in revenue per-month has decreased significantly, from just over half in 2017 to under a third in 2019[13]. Established firms (in operation for more than two years) now make up almost 40% of the market[16].

This suggests that a significant number of organisations have progressed from the 'start-up' phase, where they may not yet have a proven product or reliable ongoing revenue stream and require seed-funding, to the 'scale up' phase.

Organisations in the scale up phase have a proven product and sustained revenues. The focus of organisations in this phase is typically on growth and delivery, and they have generally achieved a level of traction in the market that will make it easier to access capital funding.

Figure 2: Biggest challenge faced by EdTech companies
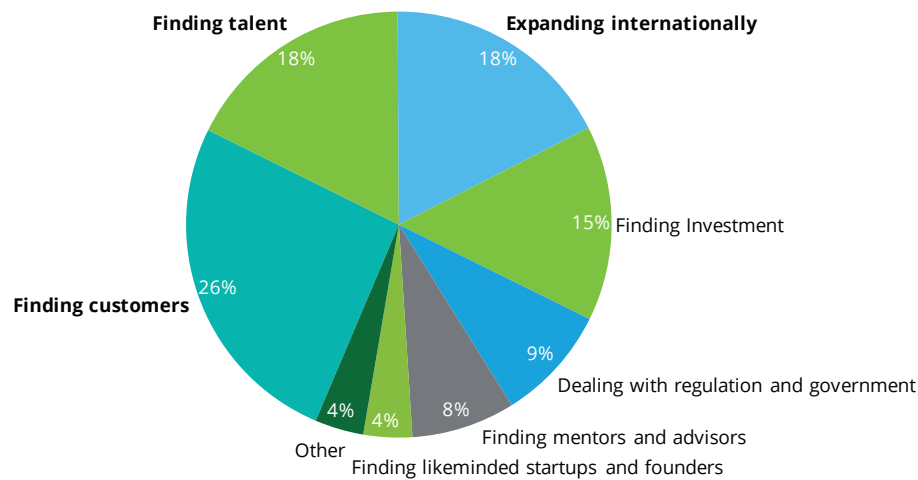
Operational focus shifts to talent and funding concerns diminish

As organisations move from the start-up to scale up phase, their priorities become more operational in nature. Importantly, so do their challenges.

This is highlighted by the results of the Census, which show that a much greater proportion of organisations (28% in 2019 versus 10% in 2017) are looking to hire more than five employees over the next six months. The Census also shows that 'finding talent' is one of the greatest challenges facing these organisations (see Figure 2).

A comparison of the 2019 and 2017 Census results not only points to the growing importance of talent. It indicates that 'finding investment' (while remaining critical) is no longer the most significant challenge for EdTech organisations.

This is not just a symptom of a market that it is maturing; it aligns with increases in start-up funding across Australia *generally*, and for the education industry *specifically*.

According to data collected by TechBoard, total funding for start-ups and young technology companies in Australia increased by 96% between 2017 and 2018 (from $3.5bn to $6.8bn)[11]. This 2018 Startup Muster survey also highlighted education as one of the top 10 industries receiving industries receiving investment in Australia[12].

This is not to say, however, that the funding environment for new EdTech organisations is straightforward. Seed funding for start-up phase organisations remains challenging, and finding investment is still a significant source of concern.

[10] HolonIQ. (2018). *Global EdTech Startup Activity. Retrieved from* *https://www.holoniq.com/global-edtech-activity/*

[11] Deloitte China and the Intelligent Education Special Committee of Automation Association (November 2019), Global development of AI-based education

Global expansion is top of mind

While Australia has a thriving education sector, in global terms our EdTech market is small. Accordingly, overseas markets are critically important for our EdTech sector.

The majority of respondents of both the 2017 and 2019 surveys reported that they had customers outside Australia, with fewer than a quarter of organisations reporting an entirely domestic customer base in the most recent census. This reflects broader trends, with data from Startup Muster highlighting that expansion outside Australia is the top long term priority for start up founders[16].

Solutions targeting schools and higher education lead, but the future of work is gaining traction

The most common solutions of EdTech organisations target the primary, secondary and higher education sectors (see Figure 3). This has not changed since the 2017 census, and is aligned closely to government spending in these areas.

The percentage of organisations focused on corporate and vocational learning products has increased (from 24% to 38% from 33% to 42%, respectively) since 2017, while around 50% of EdTech solutions concern content, learning and engagement.

This data suggests that EdTech solutions orientated around the future of work, are becoming more prevalent, which is supported by anecdotal information captured by EduGrowth.

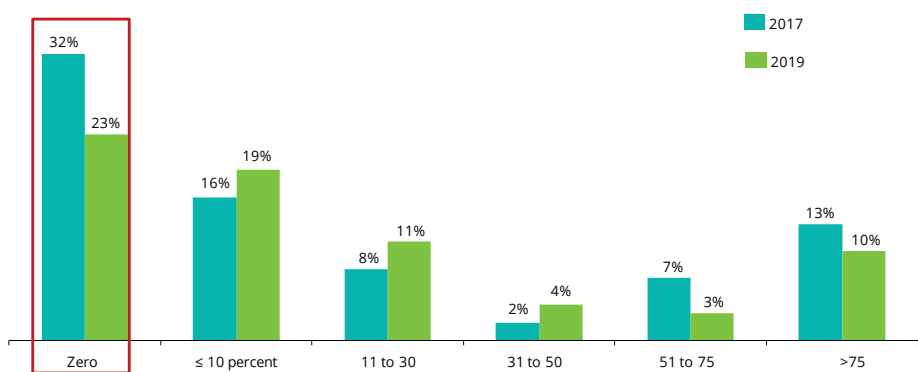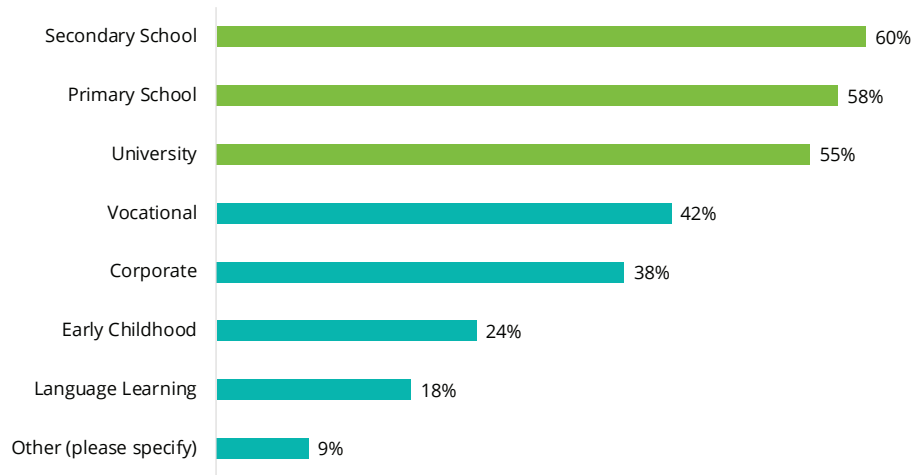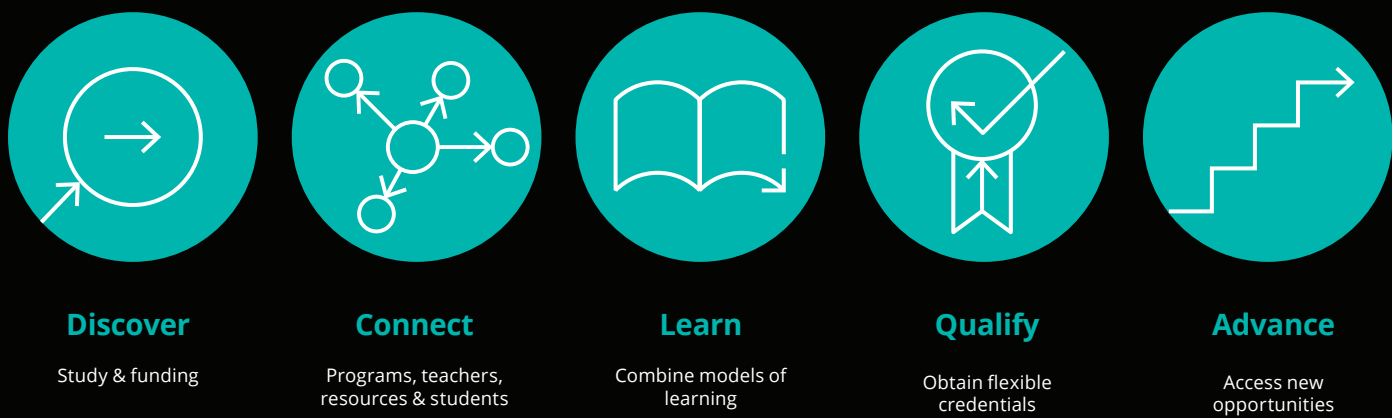Figure 3: Percentage of customers based overseas

Figure 4: Sector focus

The total is more than 100% as some respondents focused on more than one sector

3　Education value chain

What is the Education Value Chain?

Discover

Study & funding

Connect

Programs, teachers, resources & students

Learn

Combine models of learning

Qualify

Obtain flexible credentials

Advance

Access new opportunities

As we seek to better understand and define the EdTech market, both in Australia and globally, it is useful to define the types of products and services offered via a value chain. This report focuses on the 'learner', and the education value chain defined above highlights the broad stages and touch points of the learner journey. It should be noted that research and administration have distinct value chains, that are not presented here.

As lifelong learning and micro-credentials become pervasive, this journey will increasingly become an iterative process, with steps that are repeated multiple times throughout the lifetime of a learner. The education value chain lays out the journey a learner goes through from identifying a program to studying, completing and advancing to application or further study. The journey is captured in five stages: Discover, Connect, Learn, Qualify and Advance. At every stage, there is an exchange of value.

For EdTech companies, the value chain provides an opportunity to gain perspective, and review where and how they want to play across the five stages.

The analysis and commentary within this report includes examples of the types of EdTech solutions that align to each stage of the value chain, combined with a snapshots of relevant Australian EdTech organisations. These organisations, which have been identified by EduGrowth, are actively engaged in solutions and services that target the associated stage of the value chain.

Three perspectives – Learners, Employers, Providers

Learner

Employer

Provider

The Education Value Chain can be seen through the lens of Learners, Employers and Providers.

Learners seek knowledge and skills. For the purposes of the Australian EdTech Census this includes all learners, i.e., early childhood, primary, secondary, tertiary, corporate learners and others.

Employers seeking employees with specific knowledge, skills or accreditation.

Providers offer and support the learning opportunities that learners and employers seek.

Education Value Chain

Discover

Description: Prospective learners begin their learning journey by searching for study options and funding.

What types of services are, or will be, available in Discover?

Learners: Learners access admissions platforms that enable them to identify and compare courses via outcomes data. They may also explore multiple providers that offer shorter learning modules that can 'stack' to form broader (and recognised) qualifications and credentials.

Employers: Industry players review and provide discovery services for school leavers looking for practically oriented learning, linked to internships and employment outcomes.

Providers: Rankings, admissions and review services become more sophisticated and are supported by analytics that match and provide predicted outcomes.

Example – GO1: GO1 is a marketplace of training options connecting employers and training providers. GO1 also helps organisations to identify what their training needs are using information related to their type of business, geographic location, size and scale to identify their specific compliance training requirements and the like. The platform supports the entire learning journey. In the Discover phase, GO1 helps employers and employees identify training needs and solutions[17].

Connect

Description: After selecting a study or options suitable for them, Learners then begin to connect with programs, teachers, resources and other students.

What types of services are, or will be, available in Connect?

Learners: Learner platforms allow students to connect, share materials and resources and ask open ended questions.

Employers: Industry platforms provide employers and professionals with targeted educational services that are linked to professional skills requirements.

Providers: Platform aggregate content, providing choice, trust and flexibility for learners.

Example – Vygo: Vygo provides an online platform to connect students with mentors to aid studies, learning languages and professional development. Vygo partners with education providers to provide support and connectivity across student support services that span the full student learning journey. In the connect phase, Vygo helps students identify and connect with relevant support services[18].

Example – Practera: Practera offers experiential learning opportunities via a cloud-based Platform. This platform supports internships and business projects; linking students with mentors and providing them with learning modules, activities, outcomes and feedback. Although not limited to the connect phase, many of Practera's services are focused on this phase[19].

Learn

Description: Learners use a combination of old and new models of learning that cater to their individual preferences and suit their specific needs.

What types of services are, or will be, available in Learn?

Learners: Learners increasingly choose based on outcome, value and flexibility. New undergraduate entrants thrive when teaching is delivered in innovative ways.

Employers: Industry increasingly provide on-the-job education and accreditation in the form of micro-credentials and short courses.

Providers: Teaching only higher education providers emerge and become increasingly popular. The offer digitally-enabled effective learning enhanced by small, active learning style seminars.

Example – Quitch: Quitch is an app-based platform that education providers use to increase teaching interactions. It uses gamification principles to provide supplementary support to students through the use of custom games and analytics[20].

Qualify

Description: Learners qualify and obtain flexible, portable credentials

What types of services are, or will be, available in Qualify?

Learners: As lifelong learning becomes the norm, micro-credentials become ubiquitous with graduates and professionals 'owning' their own credentials and displaying them on employment and networking platforms.

Employers: Industry organisations increasingly use machine learning platforms to place candidates in life-like scenarios, capture data on how they interact with the technology and virtual community, and compare this against other individuals of varying skill levels to assess the applicability of individuals for specific roles.

Providers: Credential service providers emerge to provide trusted accreditation and assessment services, often enabled by technologies such as blockchain.

Example – Janison: Janison focus on developing and delivering innovative online assessment and learning platforms. The online nature of their assessments makes them scalable for large cohorts. There online assessment and learning platforms are used by governments, educators and corporations[21].

Advance

Description: Learners access new opportunities via industry aligned matching

What types of services are, or will be, available in Advance?

Learners: Academic and research oriented learners access research centric matching platforms.

Employers: "Industry organisations re-imagine internships to include experiences such as short term projects with start-ups, and international trips that combine workshops with an overseas industry project challenge.

Providers: Online career centres emerge, providing job readiness assessment and data-using machine learning algorithms to match students with industry.

Example – Expert360: Expert360 is an online platform that connects employers with prospective freelances and independent consultants. It matches through analytics based on skills demand, individual ratings and feedback[22].

Vygo under the innovation spotlight

Case study interview with Ben Hallett

Vygo was founded in 2017, by Ben Hallett, Joel DiTrapani and Steven Haspie. Vygo is a peer tutoring, mentoring and student support service platform designed to enable education institutions to deliver engaging, effective and scalable student services. Vygo have partnerships with a number of Australian univerisities, and have expanded to the UK through their partnership with Coventry University.

What have been the key challenges?

During its initial stages, raising the funds to develop and market the platform, and from there to expand, were Vygo's key challenges. For the founders, the scarcity of Australian based education-focused investors made this especially challenging. The relative size of the domestic market also made it necessary for the team to develop and execute an overseas growth strategy at an early stage; a common theme for Australian EdTech organisations.

In Vygo's early stages, funding from the UQ start up accelerator, UQ R Lab, proved critical to help get them off the ground. In the absence of a well-developed local group of venture capital firms with specialist education sector knowledge, Universities have become the place that EdTech start-ups can get an initial springboard and funding. There are, of course, venture capital firms that invest in EdTech, such as Larson Ventures. However, in comparison to the scale and focus of EdTech focused venture capital in the US or China, there are few investors with a deep understanding of the education sector. From their start with UQ R Lab. Vygo then went on to secure funding and support via SharkTank and angel investors.

Ben Hallett was quick to acknowledge and point out how pivotal the advice and support they received from EduGrowth proved to be in the next stage of Vygo's growth. They entered EduGrowth's pitch competition early in their development, and from this secured a speaking slot at the AFR Higher Education Summit. This in turn piqued the interest of university customers, creating the spark and impetus for Vygo to move from B2C model to a B2B delivery model. At this time AirTree, BlackBird and Larson ventures took on a mentoring role, and Larson Ventures led the embryonic organisation through their initial angel investment round. Vygo are now raising seed funding for their first million dollar investment.

They now have partnerships with eight universities, including Coventry University in the UK, with investor connections proving critical in securing an overseas client. An investor introduced Vygo to the EduGrwoth equivalent in the UK, JISC (Joint Information Systems Committee UK), who were able to help Vygo understand and navigate the UK market. Having identified and secured their first client and partner in the UK, Vygo still had to jump through a few hurdles to formalise the arrangement, including setting up a UK entity, and attaining a cyber essentials certification.

Source: Interview with Ben Hallett, Co-Founder and Director, Vygo

Beginnings- What inspired Vygo's founders?

The founders, Ben, Joel and Steven, had been mentors and tutors throughout high school and university. They saw the benefit and impact of support and guidance for students, having the firm conviction that all students should have the opportunity to mentor and be mentored.

Acting on this conviction, they set up the first version of Vygo in 2017 as UQEngTutor.com, a tutor matching service for engineering students. To do so, they went direct to the students first, and secured an active community on their platform. They soon re-branded as Vygo, named after Lee Vygotsky, an education psychologist whose social development theories highlighted the value of peer learning.

In 2018, Vygo started to attract the attention of university leaders, which prompted them to switch from a B2C model. In the early stages of their development, their success was often driven by student unions, and from student community support they were able to demonstrate the value that they could bring to insitutions as a whole. This paved the way for direct partnerships with core university services from 2019.

Their solution now provides educational providers with a platform to integrate their support services as part of a sharing economy for students. On average it is estimated that universities spend approximately 10,000 USD per year on student support services, typically offering 100-150 support options. Through a mobile app and website, the solution consolidates these support options, providing a unified platform and access point while also reducing the manual overhead.

Vygo has also introduced the mentor academy, with the vision to create the world's best online mentor platform, committing $100,000 and forming academic councils with universities in doing so.

Key learnings

Vygo highlights the importance of bringing in the right capabilities early in the process of establishing an EdTech organisation. They see three capabilities as necessary in a founding team: someone who can build, someone who can sell, and someone who can run it all. They also suggest hiring specialists to fill specific roles where it pays to acquire skilled professionals – they achieve better results, and they help to paint a better picture for investors.

Another key learning for Vygo relates to technology: you do not have to build everything. Existing cloud-based solutions often offer most of the basic functions required, which simplifies development. This can also strengthen the case to investors, as it is easier to show how the solution is con structure via well known brands and technologies.

While bringing in the right capabilities and taking advantage of existing technologies can aid the case to investors, Vygo also recommend tailoring the organisation's investment case and funding strategies. It is important to understand the frame required to appeal to each investor, and to consider how to best create this frame for them. For example, Vygo might describe themselves as a SAAS company for positioning with global investors, as the SAAS market is a well-established market that is broadly understood by the investor community.

Social impact

Vygo's mission to provide peer tutoring and mentoring opportunities to all students remains the driving force behind the organisation, impacting all that they do. In fact, Ben is clear that it is the clarity of their mission that has helped them overcome many of the hurdles and challenges they have faced to date.

Quitch under the innovation spotlight

Case study interview with Dr Grainne Oates, Founder and CEO of Quitch

Quitch is a gamified, mobile learning app that is designed to extend the traditional classroom and achieve higher levels of student engagement. It was founded in 2015 by Dr Grainne Oates, a lecturer at Swinburne University, who sought to engage and retain students struggling with their course content. The app has since won multiple awards in innovation and educational technology, nationally and internationally and has demonstrated initial outcomes resulting in a 7% increase in marks, and 12% improvement in student retention.

Beginnings – what inspired Quitch's founder?

In 2015, Dr Oates was teaching first year accounting at Swinburne University and was facing student engagement and retention challenges. Having noticed that her students were constantly using their mobile phones, she came up with an idea to develop an e-learning app to drive engagement. Quitch was co-designed with her students.

Since then, Quitch has rapidly grown in popularity and users, having sourced funding from universities, individual investors and the Victorian Government. The app is now in the hands of students and education professionals across Australia and beyond. Notably, it was selected by the Federal Government as one of eight start-ups to present at SXSW Interactive in 2017, a prominent emerging technology conference held in the U.S.

What have been the key challenges?

There have been two main challenges faced by Quitch: Securing the right people for technology development and finding the required investment.

The first challenge, having the appropriate technological capability, was particularly challenging for Dr Oates, who had come from a non-technical background. Once Quitch had gained initial traction, the team outsourced development: leading to mixed results. While Dr Oates knew what she wanted, it was difficult to find people with the right skill set to deliver on this. This prompted the Quitch team to raise capital to source a dedicated in-house team, and commit to a year of development to arrive at a stage ready for release.

From this, Dr Oates highlights the importance of having the right team when navigating technology challenges. She believes it is key for EdTech companies to identify the skills that their team has and, importantly, those that they lack, and focus on finding resources with the missing skills, and who can be trusted to deliver. Quitch now has a highly skilled local development team based in Melbourne.

Source: Interview with Dr Grainne Oates, Founder and CEO, Quitch

The second challenge facing Quitch related to sourcing investment. Once they had built the right team, Quitch were successful in securing a significant Victorian Government grant. They were then in a position to bridge the important link between government and the education sector, and most importantly, were also now generating revenue. Quitch received initial support via a grant from Swinburne University also required angel investors to support initial development costs.

Dr Oates highlights the importance of universities being flexible, in particular, with support from Faculties and Deans absolutely essential for getting Quitch off the ground.

Key learnings

As highlighted previously, gaining the right capabilities and talent is essential for culture and continued success. Dr Oates leveraged her network within Swinburne University to help find the team's first developer, and recommends being open to collaboration with other players in the market. Having the right capabilities on the team also extends to mentorship, where the team benefited greatly by having an Advisory Board consisting of Oji Udezue (Former Head of Product for Communications tools, Atlassian) and Jane Hewitt (Founder of Unilodge), who can provide guidance and a platform off which to bounce ideas. In Dr Oates' words, "there's nothing like people with experience to guide you along those paths that they have already trodden."

Another key learning is related to the development process. From the beginning, Quitch was co-designed with students and educators, and based on research around gamification principles. Ensuring the app was based on fundamentally sound research, and conducting primary testing through student focus groups, enabled the team to iteratively develop the app and continue to incorporate feedback into updates. Dr Oates advises not to spend too much time in product development trying to achieve perfection. Instead, she suggests that releasing the product into market to gain ongoing feedback is more beneficial for long-term success.

Dr Oates' final learning has been one of focus. While Quitch has adapted to different customers' needs as it has matured, it has remained focused on its original purpose of increasing student engagement. She highlights the importance of not losing sight of core principles or purpose, and the input of advisors around you to stay focused and on track. However, since inception, their definition of "student" has evolved into that of "learner", as Quitch has started being adopted by professional associations and corporates also looking to engage their members and employees.

Social impact

There is positive impact on student outcomes through use of the Quitch app, and there is also opportunity to reach communities (such as those from low socio-economic backgrounds, and those from rural areas). While students from these communities may have limited access to other resources, they are likely to have mobile phones and could access Quitch as a key channel for supplementary learning.

4 Cutting edge technology under the spotlight
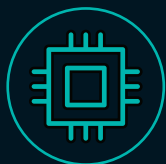
Artificial Intelligence (AI)

AI, the application of human-like thinking in technology, is a large driver of innovation in the EdTech space, and was a topic explored in the previous edition of this report. That report highlighted four key applications for AI in education that have gained traction in the two years since.

1. **Improved efficiencies in research** – Cognitive insights and the growth of sophisticated data will enable greater quality of research.

   Example 1: Popular language-learning platform, Duolingo, has +300 million users endeavouring to self-learn a language. The platform uses AI to develop an adaptive placement test, and to build a personalised learning program[23]. Furthermore Duolingo harnesses the data from its millions of users to "build unique systems, uncover new insights about the nature of language and learning, and apply existing theories at scale", through the use of AI and machine learning analysis[24].

2. **Gaining insights in class**– Using AI and analytics to proactively identify interventions that will improve students' learning experience and learning outcomes

   Example 2: Australian-based Practera has developed an "Experiential Learning Support Assistant" (ELSA) that employs AI to pre-emptively detect potential issues with students, and subsequently provide tools and guidance to be able to intervene in real-time. Interventions are suggested through a to-do list, which is automatically logged and tracked by Practera systems. Currently, ELSA is able to identify negative sentiment, with planned development for capability in determining disengagement and progression issues[25].

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[16] Wired. (2018, December). AI helps Duolingo personalize language learning. Retrieved from https://www.wired.com/brandlab/2018/12/ai-helps-duolingo-personalize-language-learning/

[17] Duolingo. (n.d.). Duolingo research. Retrieved from https://research.duolingo.com/

[18] Practera (n.d.). Automated AI-based intervention and issue detection, resolution and monitoring. Retrieved from https://help.practera.com/en/articles/2782540-automated-ai-based-intervention-and-issue-detection-resolution-and-monitoring

3. **Customised learning –** Adaptive learning technologies can instantly provide study assistance to some students who may be experiencing difficulties, and more advanced materials for those who master content quickly. This exemplifies the provision of personalisation at scale.

   Example 3: Squirrel AI Learning is a Chinese EdTech company that specialises in intelligent adaptive education, using AI to provide a supervised learning experience to students. The program determines a personalised learning plan based on data from one-on-one interactions during tutoring. Squirrel reports that the program has a 5 to 10 times higher efficiency, as compared to traditional instructions, and tout improvements in student efficacy and engagement[26].

4. **AI combined with AR/VR –** AI combined with AR/VR can provide truly immersive experiences for students by utilising complex data to construct realistic environments and simulated agents that react to user actions.

   Example 4: Pallas Advanced Learning Systems help EdTech companies create innovative products that change how providers teach, and how students learn science and related subjects. They have developed a virtual-learning kit that utilises the combined power of virtual reality and AI to enable advanced learning of STEM subjects in Australian and Hong Kong schools[27]. Through this, Pallas seeks to simplify the teaching of complex science concepts through its

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[19] SquirrelAI. (n.d.). How we're revolutionizing education. Retrieved from http://squirrelai.com/our-story

[20] The University of Sydney. (2017, August 16). A professor meets the elevator pitch. Retrieved from http://sydney.edu.au/education_social_work/news_events/events/2017/Semester-Two/CRLI-16-jacobson.shtml

[21] Austrade. (n.d.). Partner with Australian edtech companies. Retrieved from https://www.austrade.gov.au/edtech/partner-with-australian-edtech-companies/

Digital reality

Digital reality definition: In the previous edition of The Australian EdTech Market Census 2017, we noted the prominence of Augmented Reality and Virtual Reality (AR/VR), technology that overlays or creates a digital world. Digital reality is the natural progression from this, blending AR/VR technologies with the Internet of Things (IoT) and other immersive/spatial technologies. IoT involves a network of connected devices that brings users, devices, and data together. The combination of this with AR/VR delivers unique and innovative user experiences that blur the line between the physical and digital worlds.

Example 1: Harvard Business School Online (HBX) has built a custom studio featuring high-resolution video walls and roaming cameras to deliver learning content, and to offer immersive, online learning experiences for a global student cohort. Participants can connect from a computer anywhere in the world and engage with faculty members and peers just like they would in a Harvard Business School classroom.[29]

Example 2: Arizona State University and Saint Louis University have run pilot programs to place Amazon Echos in dorm rooms, synchronising them with campus-specific data to give on-campus students a personal assistant. The voice assistant speakers provide touch-free access to information and services tailored to campus living, and significantly reduce the amount of time to answer common questions.[30]

What are the potential applications of digital reality for education providers?

1. **Classrooms in the digital reality** – The combination of AR/VR and IoT allows the classroom of the future to transform and be fluid in nature. Replacing a standard whiteboard and desks, a digital reality classroom can use AR/VR to enhance remote learning and use smart technologies to improve interactions within the classroom.

2. **Combination with AI** – Digital reality in combination with AI further immerses users in a digital world that mimics our own. This provides opportunities for education providers to truly redefine how they interact with, and teach, their students.

3. **Smart Campuses** – Smart, connected devices, from the grounds to the classroom, enhance the ability to monitor and interact with a campus, and can provide time and location-based information that is contextual and personalised. Data captured on campus, and can then be analysed to draw new insights that can be applied to improve campus experience.

[22] Harvard Business School. (2015). HBX Launches HBX Live – Harvard Business School's Virtual Classroom. Retrieved from https://www.hbs.edu/news/releases/Pages/hbx-live.aspx

[23] The Verge. (2017). Amazon will put 1,600 Echo Dots in Arizona State University's engineering student dorms. Retrieved from https://www.theverge.com/2017/8/17/16161388/amazon-echo-dot-arizona-state-university-engineering-student-dorms

Blockchain

Blockchain definition: Blockchain technology enables the storage of information on a secure, permanent, historical ledger, which can be both public or private. It does so by establishing a shared, immutable record of transactions within a network, forming a true, accurate and trusted record of each transaction made. Thus, the predominant benefit of a blockchain is that it provides a fraud-free way of transferring and authenticating information.

Example: The MIT Media Lab and long standing start up, Learning Machine, collaborated in the development of Blockcerts, an open standard for creating, issuing, viewing, and verifying blockchain-based certificates. These digital records are registered on a blockchain, cryptographically signed, tamper-proof, and shareable. It has since been used in a number of instances, including MIT Media Lab's own course "Lab's 30th Anniversary", and at the Global Entrepreneurship Bootcamp in Seoul.[30]

What are the potential applications of blockchain for education providers?

1. **Trustworthy accreditation –** Accreditation that is provided through blockchain is guaranteed to be free from tampering, and can subsequently be corroborated against a digital receipt. Both of which allow for a more trustworthy representation of educational achievement.

2. **Secure databases –** Student records that hold results and other private information are kept private from malicious users, and secure from those that may seek to alter academic records. There is a similar story for research conducted, which may be sensitive in nature and thus benefits from blockchain security.

3. **Secure payments –** Providers can use blockchain payment systems to ensure they receive compensation for their work, and can subsequently reduce their expenditure on payment disputes or legacy systems.

[24] Blockcerts. (n.d.). About Blockcerts. Retrieved from https://www.blockcerts.org/about.html

Learning analytics

Learning analytics definition: The analysis and interpretation of data to identify meaningful patterns. Much like how Google uses usage data to tailor advertisements, education providers will be able to analyse learning data to draw insights into how individual students learn. Providers then have the opportunity to personalise their learning offerings; tailoring them to the learning styles and preferences of individual students.

Example 1: Bucknell University used predictive modelling to identify students needing extra support to get through their first year of university based on pre and post-enrolment data. Students who seemed less likely to achieve a GPA of 3.0 or higher (e.g. poor attendance, low grades) prompted the university to intervene. For example, a struggling student might receive a list of available tutoring services, or be sent a personal message from a tutor.[32]

Example 2: Georgia State University has been successful in using 'big data' to improve the educational outcomes of low-income, first-generation and minority students. The University monitors around 800 academic risk factors and financial indicators of each student in order to provide timely advising and instructional help. The University has collected data since 2012 and the resulting support has improved four year graduation rates by 7%.[33]

What are the potential applications of learning analytics for education providers?

1. Course curriculum design – Analytics can provide insight into the performance of, and attitudes towards, curriculum design. This can then be applied to refresh curricula to improve quality and learning outcomes.

2. Student prediction – Leveraging behavioural analytics to identify patterns in student behaviour that may be able to predict student outcomes, and subsequently provide timely proactive support.

3. Tailored marketing – Insights gleaned from learning analytics can be applied to provide a more tailored marketing solution for education providers to increase recruitment and retention efforts.

[25] The Philadelphia Inquirer. (2016, September 23). Commentary: Helping students over initial college hurdles. Retrieved from https://www.inquirer.com/philly/opinion/commentary/20160923_Commentary__Helping_students_over_initial_college_hurdles.html

[26] NPR. (2016, October 30). How One University Used Big Data To Boost Graduation Rates. Retrieved from https://www.npr.org/sections/ed/2016/10/30/499200614/how-one-university-used-big-data-to-boost-graduation-rates

API Economy

API Economy definition: Application Programmer Interfaces (APIs) enable diverse applications, platforms, and systems to connect and share data with each other. The use and management of APIs in this manner is referred to as the API Economy, and has the potential to drive efficiencies, growth and innovation.

Example: Pearson uses KrakenD as its API gateway solution in the development of its Parent App, which provides parents with learning resources for their child. The API handles user authentication, security, and aggregation of Pearson data within the app.[34]

What are the potential applications of the API Economy for education providers?

1. **Efficient scaling** – A centralised developer portal for the university community to design bespoke systems and data sets that can be scaled across the University.

2. New revenue streams – Core assets can be reused, shared, and potentially monetised through APIs, extending the reach of existing services and providing new revenue streams.

3. Enhanced partnerships – Resources could be shared with education and industry partners to create a seamless experience for students and researchers.

[27] KrakenD. (2018). API Gateway for the education sector: parental control. Retrieved from https://www.krakend.io/case-study/pearson/

5 What could the Australian EdTech market look like tomorrow?

Today's start-ups will be tomorrow's established players

The EdTech market of tomorrow will be shaped by the emerging start-ups of today. Australia has some well-funded, emerging, EdTech companies that will shape the future direction of the market.

Analysis shows that twelve organisations in Australia's EdTech sector raised seventeen rounds of Series A+ funding between 2016 and 2019. Three of these - A Cloud Guru, GO1 and Cluey Learning - raised the largest fundraising rounds on record, respectively[34].

Global investments mirror the 'mega trends' in education and work

Of these twelve organisations, six are focused on the future of work via corporate or lifelong learning platforms, and four are focused on higher education.

This follows global trends that have investors, education providers, and employers racing to address evolving labour market skills gaps.

GO1 (which was featured as a case study in our 2017 report) and A Cloud Guru are good examples of EdTech organisations that have moved in step with these trends. Both offer solutions targeted at employers and employees, and between them they raised $63 million through offshore venture capital and private equity in 2019[34].

Where there is investment enthusiasm, EdTech start ups will surely follow, and there are indications of this in the 2019 EdTech census data.

Figure 5: Start-up themes

Theme	%
Business to Business	75%
Software as a Service	64%
Business to Consumer	63%
Business to Government	38%
App	36%
Marketplace	22%
Social Enterprise	16%
Desktop software	13%
Physical Product	6%
Other (please specify)	5%
Infrastructure as a service	4%
Not for Profit	3%
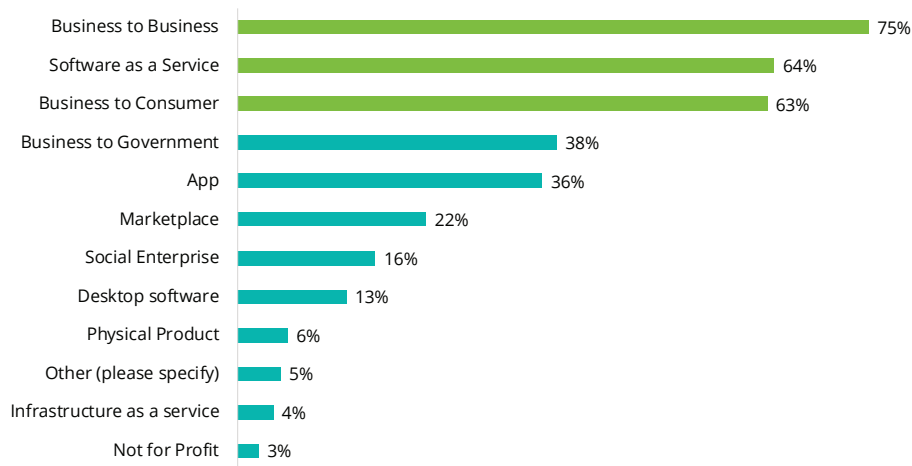
The total is more than 100% as some respondents focused on more than one theme

Solutions and business models will evolve in line with trends

As part of the 2019 Census, EdTech start up organisations were surveyed to explore their plans for business models, solutions and products.

Positioning Australian EdTech for the future

Survey respondents indicate a preference for business-to-business solutions (see Figure 5). These have the potential to scale more rapidly than some business-to-consumer solutions, and also aligns to broader trends more closely integrating education and work.

While Australian EdTech firms are securing significant funding and are clearly moving in step with trends and investment, global competitiveness will be key to success.

International investment in EdTech is ramping up, with capital investment reaching $7bn worldwide in 2019. Although this is a staggering increase (from $500m in 2010), the majority of funding has come from two countries: China and the US[35].

To date, Australia's EdTech industry has benefited from the launchpad of a thriving domestic sector, and there are many examples of EdTech solutions developed through university incubators. However, innovation requires capital, and if the sector is to reach the next level and be more competitive globally, access to funding and increased support from private investors here and overseas will be critical.

Australia has few local venture capital firms targeting EdTech, but is home to organisations that are capturing customers and investment overseas. This represents a clear and untapped opportunity for domestic investors, but will only be fully realised through increased collaboration and focus from policy makers, industry and education providers.

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