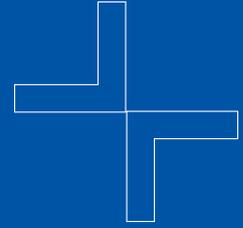




# UniServices Annual Review 2020

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## A message from the Board Chair



Without question, 2020 was a time of massive global upheaval. However, it also enabled universities to provide critical support for their communities and promote positive change.

The Covid-19 pandemic has demonstrated the value of research and the responsiveness of the research community. University of Auckland researchers had a major role in informing the national response, praised around the world for its effectiveness. The pandemic and the ongoing climate crisis have also highlighted inequities. Our researchers have thus focused on incorporating equity and sustainability into all aspects of the response.

2020 was a challenging year, but by helping connect research with national and international needs, UniServices has played a part in enabling a better post-pandemic future.

### **James Metson**

**UniServices Board Chair,  
Deputy Vice-Chancellor Research,  
University of Auckland**

## A message from the CEO



Even before Covid-19, I always thought UniServices would rise to any challenge. Now I know. Time after time in 2020, I saw people show their best, going beyond expectations.

UniServices not only pulled together to catalyse impactful research, we ended the year in a healthy financial position. Whether working from home or the office, we collaborated and grew stronger as a team.

Working with researchers and entrepreneurs at a time in history when research, science and innovation were more important than ever before, we played a significant part in expanding knowledge and the economy. Despite an initially challenging outlook, everyone in UniServices did themselves proud.

### **Andy Shenk**

**UniServices CEO**

# UniServices by the Numbers

Total external research funding:

**\$192.5 M**

(6.6% increase over 2019)

**40**

companies started in the last five years

(2016-20)

**\$250 M**

in third-party capital raised in the last five years

(2016-20)

**445**

patents licenced over the last six years

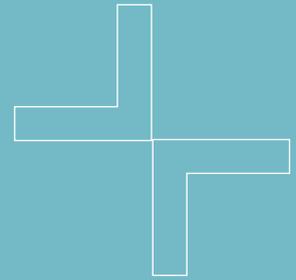
(2015-20)

**883**

invention disclosures in the last six years

(2015-20)

# Bringing Ideas to Life



UniServices plays a unique and important role in bringing ideas to life in Aotearoa New Zealand. Since 1988, we have acted as the kaihono – those who link people to people and people to projects – bridging academia with business, government and communities. Concretely, we do this in the following ways:

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## Advancing research

We help researchers find and secure funding, liaise with government and industry, negotiate contracts and manage stakeholder relationships.

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## Commercialising and protecting ideas

We help researchers disclose and protect their ideas, learn about the commercialisation process, secure patents and start companies. We help fledgling companies get expert advice, refine their business plans and access start-up capital.

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## Investing and partnering

We manage the [University of Auckland Inventors' Fund](#), a \$20 million pre-seed and seed stage investment fund that works to transform university research into high-growth global companies. We also work with partners to license technologies. We are a key part of the innovation ecosystem that brings University of Auckland research to the world.

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## Delivering positive community impact

Our business units deliver projects, programmes or services that build on University of Auckland research to deliver positive impacts to the community in areas such as education, health, innovation and informing public policy.

# World-Class Research

Research is at the heart of everything UniServices does. Whether we're helping researchers establish relationships with investors, apply for funding, negotiate contracts or commercialise research, it's about turning research into impact.

Research is also at the heart of the University of Auckland's international reputation. In 2020, for the second year in a row, the university was ranked No.1 in the world in the [Times Higher Education \(THE\) University Impact Rankings](#), which measure the performance of universities against the United Nations Sustainable Development Goals. The University of Auckland was also the top-ranked New Zealand institution in the [QS World University Rankings](#) (81st in the world) and [THE World University Rankings](#) (147th in the world).

The pages that follow give examples of significant research programmes initiated in 2020 through the collective efforts of UniServices and the University of Auckland.



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## Research with, for and by Māori

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The University of Auckland is committed to [Vision Mātauranga](#), which is about unlocking the innovation potential of Māori knowledge, people and resources. Not only is it making strides in involving Māori in research, in 2020, it developed a plan for the [revitalisation of Te Reo Māori](#) through measures including the UniServices-supported development of the [Te Kūaha app](#), which helps the university community learn basic Māori language and protocol.

# Spotlight on Covid-19

Initially, Covid-19 threw a spanner into the works at the University of Auckland. Within 48 hours, **40,000 students and 6,000 staff needed to adjust to working from home.** Research involving face-to-face contact had to change or stop. There were massive logistical issues, down to **how to look after a lab's fish.**

A spanner, however, is a tool. University labs and their staff stepped up to help the country deal with a **massive Covid-19 testing surge.** Researchers came up with innovative ideas to respond to the crisis and the **government came through with funding** for the best of those ideas. The Auckland Medical Research Foundation also provided **emergency research grants.**

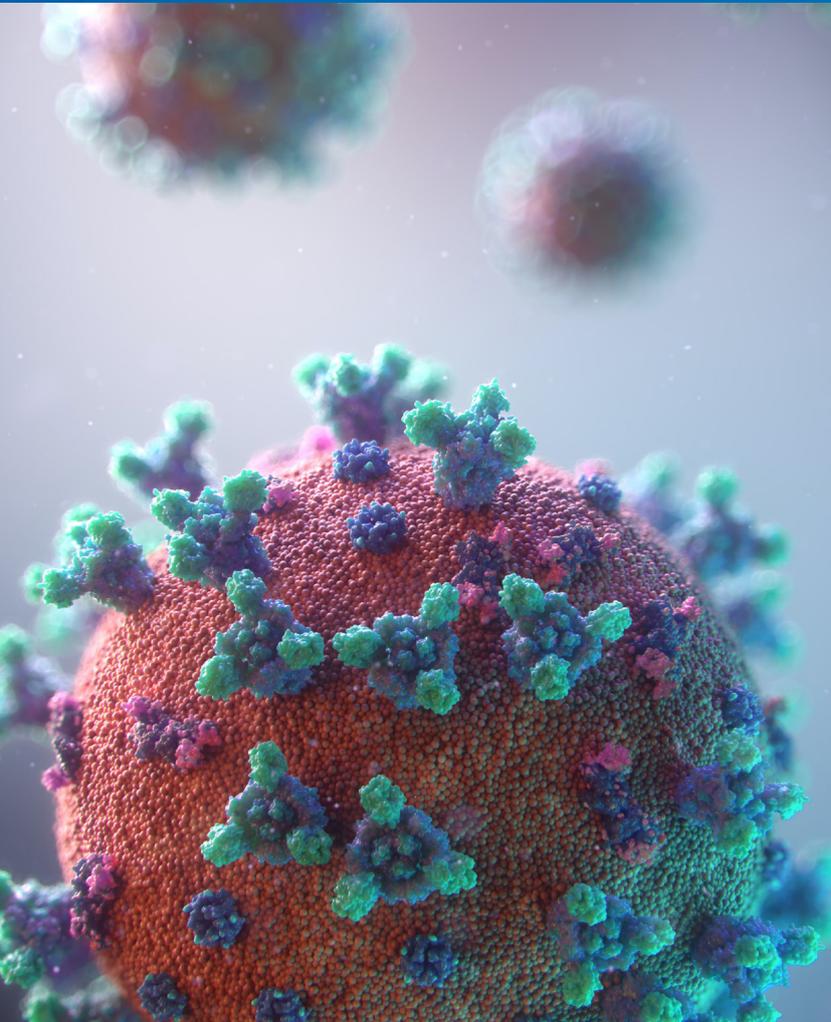


# Covid-related projects included:

- A mobile solution to **disinfect and potentially reuse personal protective equipment**.
- The development of sensors that can **remotely monitor people for fever**.
- Research on short and longer-term **mental health consequences of lockdown**.
- Work to develop effective **antiviral treatments**.
- Assessing New Zealand's **pandemic preparedness at the primary care level**.
- **Detecting previous Covid-19 exposure** through antibody testing.
- **Supporting youth mental health** with a dynamic chatbot.

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These and other projects came together quickly – but many arose from years of research in related areas, swiftly adapted to respond to a global crisis.



## Modelling the pandemic

Before Covid-19, “modelling” conjured images of fashion. As the pandemic took hold, modelling took on new importance as policy makers made decisions based on what scientists predicted would happen to case numbers and deaths under specific circumstances. In New Zealand, many of the government’s internationally praised decisions were based on modelling by [Te Pūnaha Matatini](#), a University of Auckland-hosted Centre of Research Excellence.

Under lead researcher [Shaun Hendy](#), the centre received [\\$1.5 million in funding](#) to develop an open-source national epidemic model and policy simulator. Its [daily modelling updates](#) to the National Crisis Management Centre informed policy and operational decisions.



Under lead researcher [Shaun Hendy](#), the centre received **\$1.5 million** in funding to develop an open-source national epidemic model and policy simulator.

## A better way to monitor lungs



The sickest Covid-19 patients often need ventilators. But ventilators themselves can damage lungs, so lung function needs to be monitored. Traditional monitoring is done only with sporadic external measurements. Electrical impedance tomography (EIT) is better, since it allows for continuous monitoring using a belt of electrodes around the chest, but it produces low-resolution images based on simplified assumptions about lung shape.

With a [\\$150,000 grant](#), [Haribalan Kumar](#), [Merryn Tawhai](#) and [Alys Clark](#) of the Auckland Bioengineering Institute are working on improving EIT by using patient-specific lung models. Their work aims to make EIT easier to interpret, thereby improving patient outcomes.

# Collaborative Research

Collaboration between disciplines often results in great creativity. In 2020, the Auckland Bioengineering Institute worked with the Faculty of Creative Arts and Industries (CAI) to produce cyber art-science installations for the international **Arts Electronica** festival and to create an **interactive light installation**, RainbowHub, for the Auckland Pride Festival.

The inaugural Cross-CABLE Collaboration Awards, co-sponsored by UniServices and the CABLE faculties (CAI, Arts, Business & Economics, Law, Education & Social Work), encouraged researchers in these faculties to work across disciplines. Five teams won \$10,000 each to support applications for external funding.

Cross-organisational collaboration is also important. That's why the University of Auckland agreed a **partnership with Tower Insurance** to engage in joint data science research.





## NZ XR Summit

To strengthen national and international connections in the domestically fragmented and competitive Extended Reality (XR) industry, UniServices and the Auckland Bioengineering Institute co-hosted the inaugural NZ XR Summit.

Fulfilling our role to act as the kaihono in the ecosystem, the aim of the event was to connect industry partners with our world-class researchers to design solutions for commercial challenges.

The event featured more than 30 speakers and a dozen exhibitors from the XR industry and research sectors, reconnecting the creative tech community after a tough year of lockdowns. Indigenous XR storytelling, remote collaboration, and virtual reality in retail, tourism and sports were some of the highlights.



# International Research

Covid-19 travel restrictions made international research difficult. Many researchers still found ways to make it work.

## Biomedical research collaboration with Chinese institutions

The **Maurice Wilkins Centre**, a Centre of Research Excellence hosted by the University of Auckland, received \$9.5 million in funding to work with partners at leading institutions in China, particularly the Chinese Academy of Sciences. The partnership is expected to generate new scientific knowledge that can be translated into treatments for cancer and metabolic, infectious, neurologic and degenerative disease.



**\$9.5 million** in funding to work with partners at leading institutions in China.



## Mental health in the Cook Islands

With its small population and isolated location, data on mental health in the Cook Islands has been scarce. A project led by Psychology lecturer [Sam Manuela](#) aims to change that. He's leading a team of Cook Islands researchers and data collectors to conduct a comprehensive survey aiming to capture islanders' experiences of mental health issues at a time when Covid-19 has put economic stress on the country.

## Research partnership with Penn State

Even without the ability to travel back and forth, the University of Auckland and Pennsylvania State University entered a partnership to collaborate remotely. Eight projects were selected for cross-university collaboration. Seven involved science or engineering research while one was a joint teaching project.

**8** projects were selected for cross-university collaboration.



# Health and Wellness Research

Though Covid-19 dominated the news in 2020, University of Auckland researchers made strides in other areas of health and wellness research too.



## Healthy Hearts

Heart research got a major boost when a new \$40.5 million University of Auckland-hosted [Centre of Research Excellence for heart health](#) was established. Healthy Hearts for Aotearoa New Zealand is funded for an initial eight years – the largest sum ever allocated to heart research in New Zealand.

Cardiovascular disease is not only the leading cause of death and disability in Aotearoa, it's the single biggest contributor to a seven-year gap in life expectancy for Māori and Pacific people versus the rest of the population. A major focus of the centre is to close that gap by working closely with Māori and Pacific leadership committees and community partners.

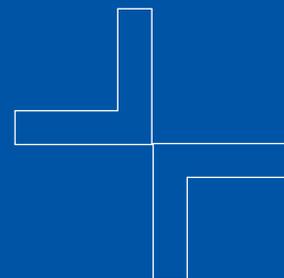
**\$40.5 million**

University of Auckland-hosted Centre of Research Excellence for heart health established.

## Teaching healthy sexuality

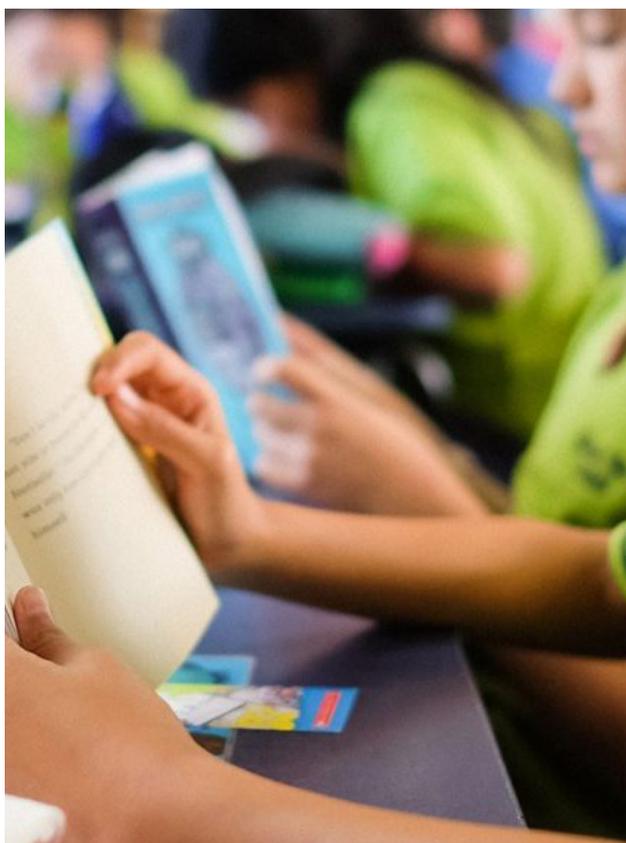
Teaching children about healthy sexuality isn't so much about S-E-X as developing confidence and a positive sense of self so they can recognise unhealthy relationships and sexual abuse. Resources in that vein, particularly for children from Pacific backgrounds, are lacking. Postdoctoral fellow [Analosa Veukiso-Ulugia](#) aims to change that. She received funding to develop, pilot and evaluate a [Pacific resource toolkit in sexuality education](#) for New Zealand primary school teachers.

# Education Research



**Covid-19 made 2020 a challenging year for schools, students and parents. Education researchers whose work focuses on crisis and resilience therefore made an impact nationally and internationally.**

Maths education specialist **Lisa Darragh** surveyed parents on their experiences **supporting their children's maths during distance learning**. **Carol Mutch**, who is UNESCO Education Commissioner for New Zealand, won a University of Auckland Research Excellence Medal for her work on the **roles schools play in disaster response and recovery**. **Peter O'Connor** and Mutch led a trans-Tasman collaboration to provide **tools for teachers to guide children after the disastrous Australian bush fires** of 2019-20. These and other projects are aimed at strengthening schools and communities during challenging times.



## A UN hub for Quality Education

In 2020, the University of Auckland was appointed as the official **United Nations hub for the fourth Sustainable Development Goal (SDG), Quality Education**, an honour and responsibility that means it will lead discussion and action on this issue globally.

In May 2020, environmental education lecturer **Sally Birdsall** was the first from the university to present at a United Nations Academic Impact Hub webinar. She talked about the connection between education and equitable societies and gave examples of **how to embed SDGs into the curriculum**.



**Research  
to Action:  
Evidence-Informed  
Service Excellence**



UniServices is proud to manage a portfolio of business units – projects and services that translate cutting-edge knowledge into impact. Built on evidence-based research, these offerings are recognised as leaders in their fields, delivering social, health and economic benefits through education, public health, innovation and informing public policy.

**In 2020, UniServices managed seven business units, with a few smaller programmes under the umbrellas of business units. The business units were:**



*Called Future Learning Solutions in 2020.*



# Immunisation Advisory Centre

The Immunisation Advisory Centre (IMAC) serves as a source of independent, evidence-based information regarding vaccine-preventable diseases and immunisation. In addition to providing national strategic and policy advice, it educates New Zealand's vaccinators and provides clinical standards and engagement opportunities for health professionals.

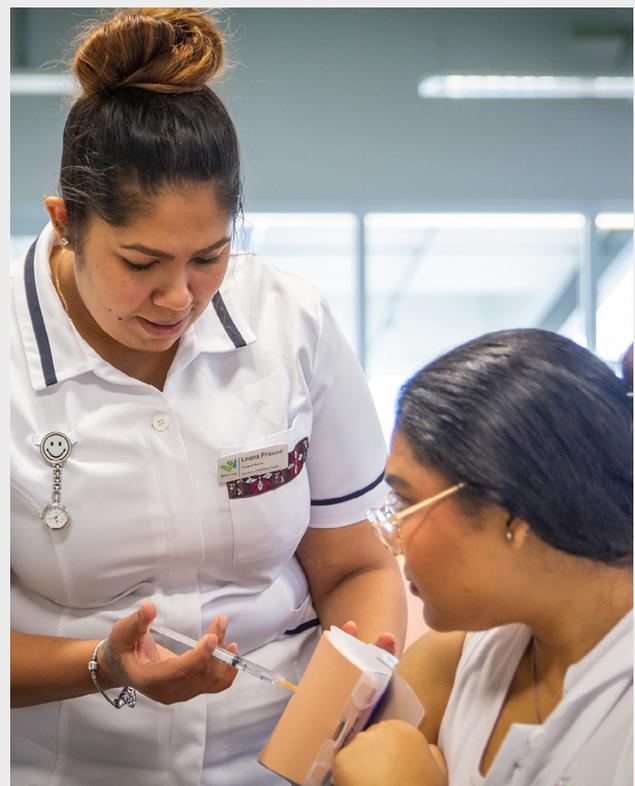
In 2020, IMAC was involved in preparations for the Covid-19 vaccination programme through the education and support of the health workforce. IMAC Medical Director **Nikki Turner** was appointed as a member of the newly formed Vaccine Strategy Science and Technical Advisory Group offering advice to the government for a safe and effective Covid-19 vaccine strategy.

Meanwhile, IMAC continued supporting the ongoing National Immunisation Programme to protect whānau and communities from diseases such as measles, influenza and tetanus.

## Preparing for the Covid-19 vaccine roll-out

Distributing and delivering Covid-19 vaccines to New Zealand's team of five million was set to be the largest immunisation programme in the country's history and had to be carefully planned. Part of the plan required a much larger vaccinator workforce.

In anticipation of this need, the IMAC team developed a provisional vaccinator foundation course to boost additional vaccinator numbers from a broader range of health professionals including nurses, paramedics, pharmacists and final-year nursing students.

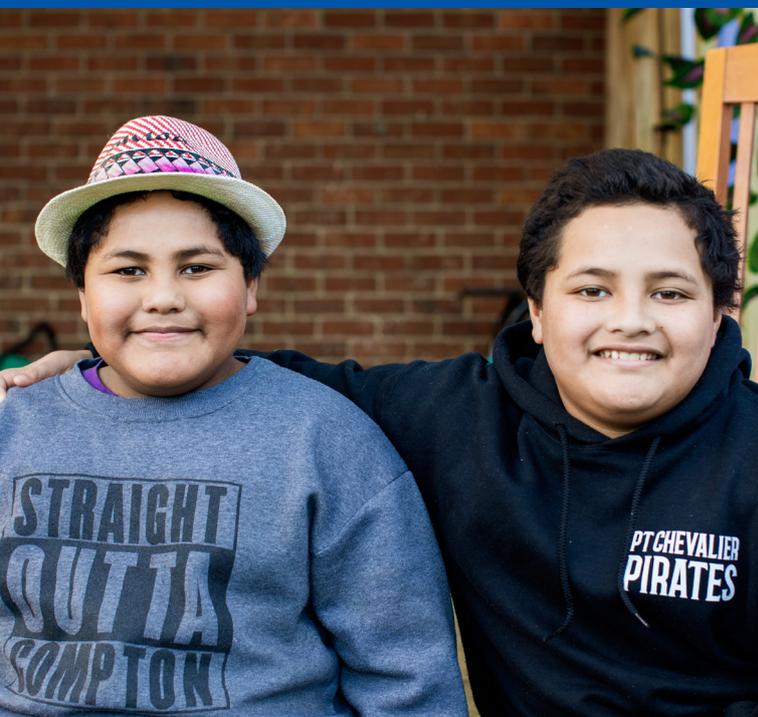


# Growing Up in New Zealand

More than 6,000 tamariki and their whānau are at the heart of Growing Up in New Zealand (GUINZ) – this country’s largest contemporary longitudinal study of child development.

The study, funded by the New Zealand government, collects scientific evidence to support policy development and service delivery to improve outcomes for all children in Aotearoa New Zealand.

The unit produces a range of cross-disciplinary academic research, along with reports and policy briefs. It provides researchers, policy analysts and others with access to a wealth of data about child health, development and wellbeing.



## Now We Are Eight

The *Now We Are Eight: Life in Middle Childhood* report was released in November 2020. It provided a unique and detailed insight into the lives of New Zealand eight-year-olds.

The report shed light on many key issues for youth today including ethnicity, gender identity, body image, screen time use, bullying, mental wellbeing and obesity.

## Diverse research findings

GUINZ also produced multiple research outputs in 2020, all receiving coverage in national media. Highlights included:

- Sleeping well protects at-risk pre-schoolers from obesity.
- Early childhood education is good for social outcomes, but means more childhood illnesses.
- Specific family habits can help children develop self-control.
- Which foods are most associated with childhood tooth decay.

## National Institute for Health Innovation

As the Covid-19 pandemic unfolded, the National Institute for Health Innovation (NIHI) was awarded [funding from the MAS Foundation](#) to build a platform that supports public health experts and researchers to provide rapid evidence reviews for decision makers.

With the help of the platform, decision makers could request information from researchers and public health experts who were then able to provide evidence reviews with ease and rapid turnaround. The outputs of these rapid reviews have helped inform DHB regional advice and decisions as well as Ministry of Health advice to government.



## Future Learning Solutions

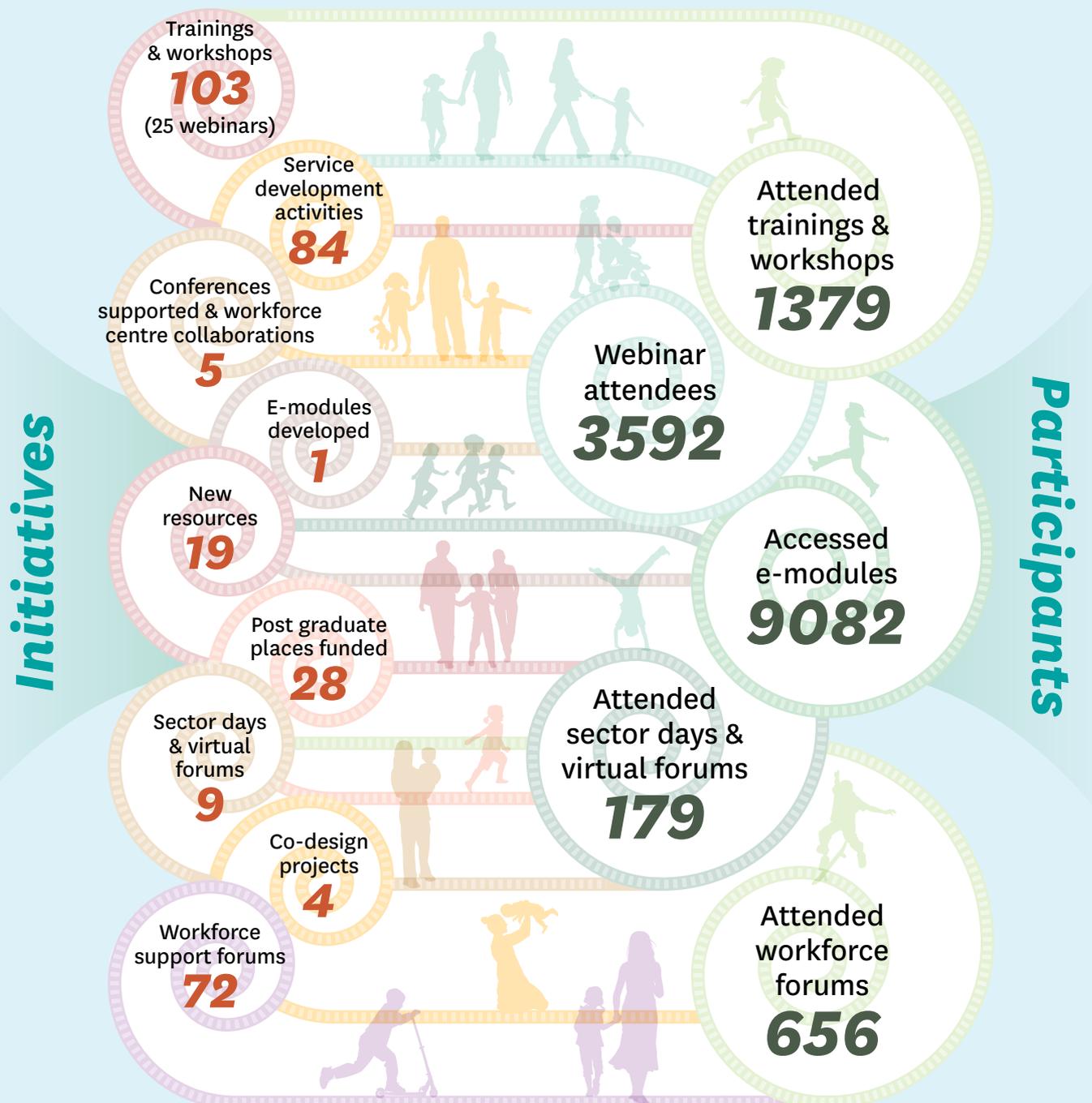
In 2020, Future Learning Solutions continued its work with 85 schools in six provinces in the Solomon Islands to deliver its [Leaders and Education Authorities Project \(LEAP\) programme](#). Funded by the Ministry of Foreign Affairs and Trade, LEAP's overall purpose was to help schools improve students' opportunities to learn literacy through [strengthening the work of Solomon Islands teachers, school leaders and authorities](#).

Although the programme ended in December, work had already started to integrate the learnings from LEAP into the relevant government ministry, education authorities (EAs) and schools so that these become sustainable and are spread out to other schools and EAs in the Solomon Islands.

**Working with 85 schools**  
in the Solomon Islands to upskill  
teachers and educational leaders.

# Werry Workforce Whāraurau

Werry Workforce Whāraurau helps develop the capacity of the health workforce in Aotearoa New Zealand to support the mental health of young people and whānau. In 2020, programmes had to adapt radically in response to Covid-19 restrictions but wound up reaching more people than ever before.



# Centre for Advanced Magnetic Resonance Imaging

The Centre for Advanced Magnetic Resonance Imaging (CAMRI) offers imaging for research and clinical needs. In 2020, it continued to successfully operate through each alert level, adapting to different protocols to provide safe and efficient MRI services.

On the clinical side, CAMRI provided necessary MRI scans to local district health boards in specialty areas such as paediatric scans under general anaesthetic and complex cardiac, brain and liver scans, plus urgent scans for private patients. On the research side, CAMRI provided imaging for cancer research, clinical trials and other priority areas. Despite the lockdowns, it maintained 96 percent of its 2019 volume of research scans.





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## English Language Academy

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The English Language Academy (ELA) offers English-language instruction largely for people aiming for entry to the university's undergraduate and post-graduate programmes. In 2020, it faced challenges due to the strict border restrictions imposed to curtail Covid-19. Nonetheless, it successfully moved to an online delivery model, offering its core university pathway courses to students in their home countries, with more than 200 students moving on from the ELA to start their main university programmes. In addition, the ELA continued to deliver bespoke online group programmes for partner universities overseas.





# Research to Innovation: Commercialising New Technologies

The University of Auckland is increasingly known worldwide as a centre for entrepreneurship and innovation, and UniServices has been part of building this reputation.

From holding workshops so students and staff can learn about the commercialisation process and practice their elevator pitches to investing in fledgling start-ups, UniServices helps academics turn their research into commercially viable products and services.



# Student Innovation

Students are at the heart not only of the university but of many of its best ideas. Hundreds entered the annual **Velocity Innovation Challenge** and 80 entered the **Velocity \$100k Challenge**. Others entered different competitions or just started their own businesses.

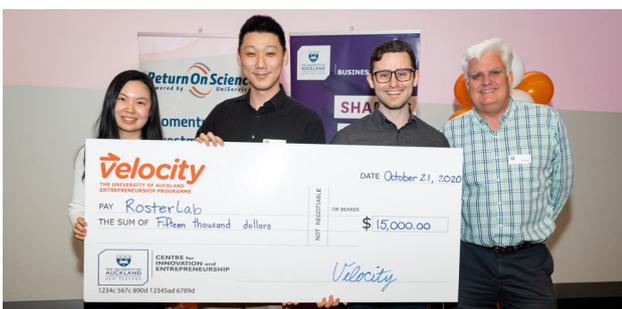
## Modular Realms

Annabelle Collins was a PhD student researching tuberculosis when a brain injury forced her to give up her studies. Playing Dungeons and Dragons was therapeutic, as was making detailed game pieces so good, others wanted to buy them. **Modular Realms** raised \$40,000 on Kickstarter.



## RosterLab

**RosterLab**, the overall winner of the Velocity \$100k Challenge, uses AI to produce hospital staffing rosters. Founded by PhD student Isaac Cleland, the software platform balances variables such as staff skills and satisfaction, legal obligations, patient demand and the need for Covid-19 bubbles.



## Nikau Robotics

The \$100k challenge's New Venture category winner, **Nikau Robotics**, aims to automate woodworking. Mechatronics Engineering student Harrison Lawton got the idea while helping renovate his family home, work he found strenuous and repetitive – ideal work for robots.



## Heart Healer

A team of students created **Heart Healer**, a customisable chatbot that helps users stay healthy and productive during lockdown. It placed top in New Zealand, third overall in the MYOB IT Challenge.



# Return on Science and Momentum

**Return on Science** is a national research commercialisation programme that connects researchers and entrepreneurs with top-tier guidance and efficient access to capital.

It does this through investment committees consisting of experts in the science and business of: agritech and foodtech; biotech and pharma; digital technologies; physical sciences; and medtech and surgery.

**Momentum** is a sister programme to Return on Science, but its investment committees are student-led and focus on start-ups by geographical location rather than by industry. There are Momentum investment committees in Auckland, Wellington, Otago, Canterbury, and in 2020, a **Manawatū investment committee** was established.

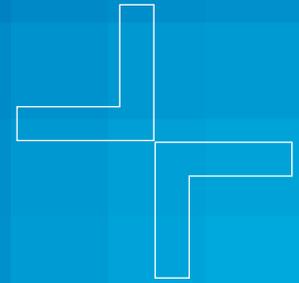
Throughout 2020, both Return on Science and Momentum continued meeting regularly, via Zoom whenever Covid alert levels made it necessary. In total, the different Return on Science committees met 42 times and Momentum committees met 28 times, with a few groups of entrepreneurs or aspiring entrepreneurs presenting at each meeting.

Return on Science committees met **42 times** and Momentum committees met **28 times**.

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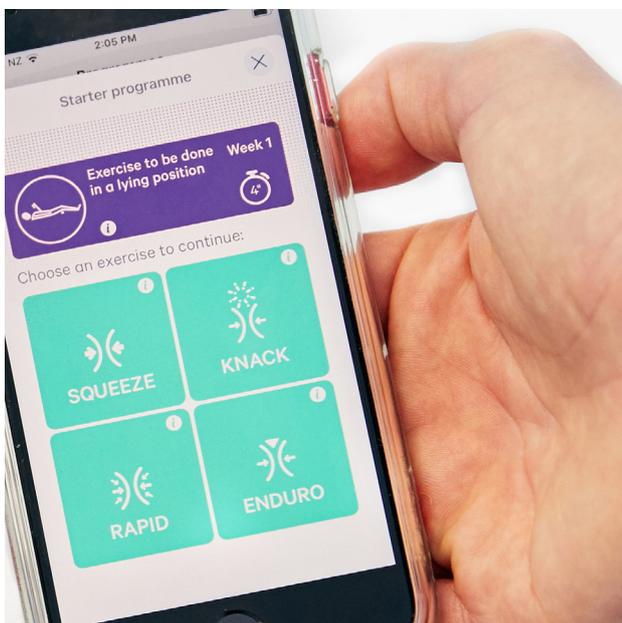
# Inventors' Fund



The \$20 million University of Auckland Inventors' Fund, managed by UniServices, is a pre-seed and seed stage investment fund aiming to transform university research into high-growth global companies. Some of its 2020 highlights include:

## JunoFem

Stress incontinence, a common problem for women, is often treated through pelvic floor exercise. However, learning to do the exercises correctly generally requires one-to-one specialist physiotherapy. JunoFem is changing that through its femfit device and app. In 2020, [CEO Jen Barnes placed third](#) out of 120 applicants in She Loves Tech, the world's largest start-up competition for women and technology.



## Tinnibot

Tinnitus is a common problem that causes sufferers to hear ringing or other noises in their ears. [Tinnibot](#), an evidence-based chatbot app developed by audiologist Fabrice Bardy, uses behavioural change, therapeutic soundscapes and mindfulness training to make treatment more personalised and accessible. In 2020, UniServices invested in Tinnibot to support its commercialisation.

## Cirrus Materials Science

Cirrus Materials Science develops nanotechnology-based coating solutions with sustainability in mind. Examples include paint-free colour finishes for light metals and technology that allows for thinner but stronger gold coatings in tech. Cirrus closed a further funding round in 2020 and its founder, Professor Wei Gao, won a [Vice-Chancellor's Research Commercialisation Medal](#).

# Finances

UniServices weathered an exceptionally difficult year from a financial perspective in 2020. As with organisations across the globe, the Covid-19 pandemic and resulting border closures and supply chain disruptions meant that 2020 presented UniServices with unprecedented challenges. The organisation saw revenue decline by nearly 10% for the year. The organisation responded with cost containment initiatives and was able to reduce indirect expenses by nearly 19% and direct expenses by 15%. Cost containment measures were carried out in addition to efforts to ensure a safe and reliable remote working environment, along with a significant push to redesign the delivery of services to customers as either digital only or primarily digital.

A key financial metric for UniServices is the value of research funding activated during the financial year. During 2020, UniServices was able to deliver the nearly \$200 million target and do so while keeping costs incurred to secure those funds within budget. This was especially challenging during a year where funders were stretched with their own unprecedented challenges due to Covid-19 but they were able to see the value of the research work undertaken by the university and facilitated by UniServices.

Our investment portfolio has maintained its strong position of more than \$50 million in investment value. The organisation had no new start-ups as the focus was on investing in our current portfolio companies to ensure they weathered the Covid-19 headwinds, while also licensing 74 new patents in 2020. The UniServices balance sheet remains strong with net assets of nearly \$80m.

# Contacts

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IDEAS TO LIFE RANGAHAUA KIA WHAI HUA

