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*Holmesglen Research 2023*: *The path ahead.*
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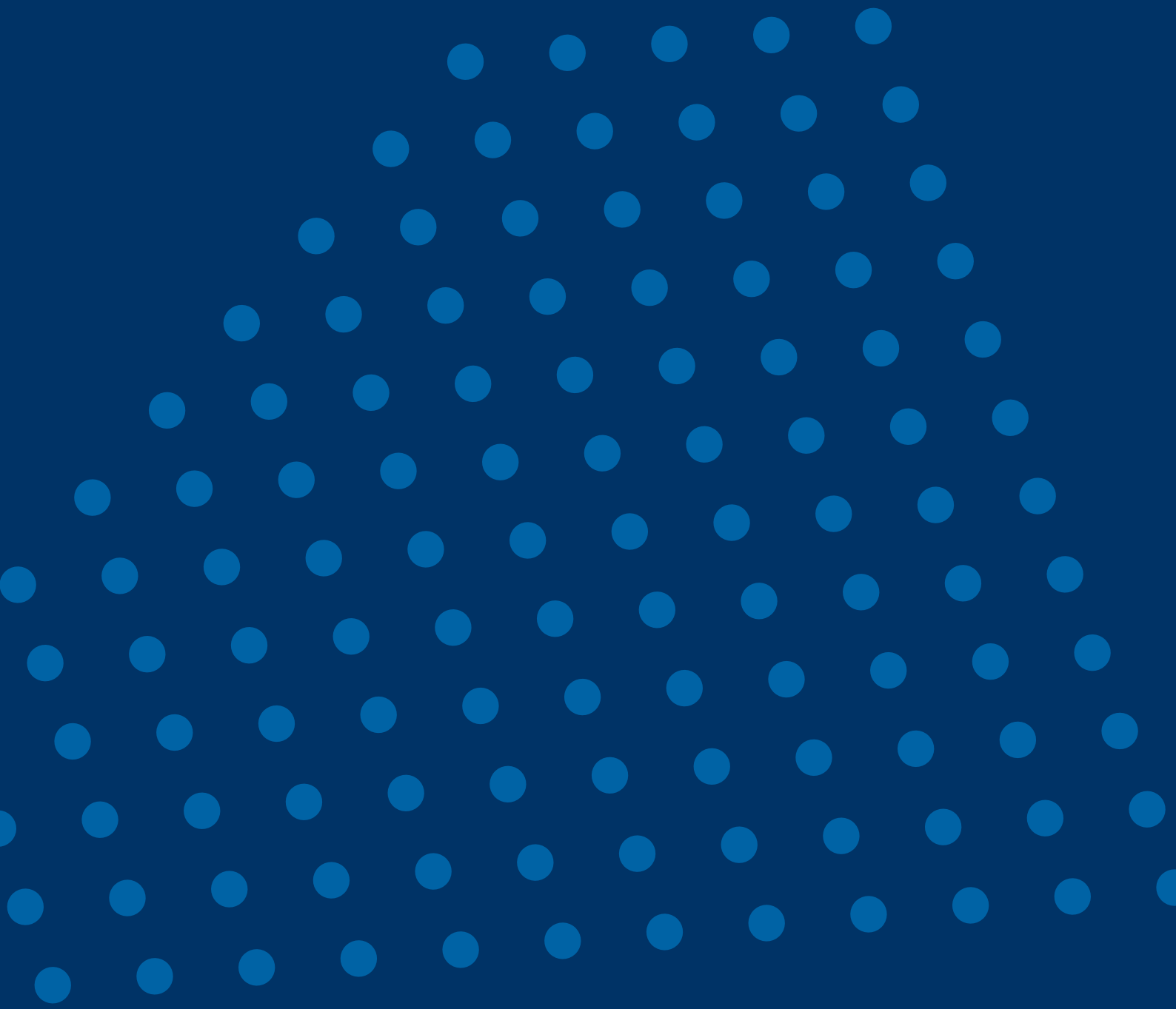
Holmesglen Centre for Applied Research and Innovation

# Holmesglen Research 2023

## The path ahead



**Holmesglen Centre for Applied Research and Innovation**

# Holmesglen Research 2023

## Contents

# From the Director

**Dr Henry Pook**
Director, Centre for Applied Research and Innovation

**Welcome to Holmesglen Applied Research '23: the path ahead, a report compiled by the Centre for Applied Research and Innovation ('the Centre') to recognise the individual and combined achievements of Holmesglen research during 2023.**

It has been almost a decade since the idea of TAFE-based research was heralded as part of the VET landscape. Fashioned to focus on the applied nature of research projects, and firmly embedded in an industry context, these early steps in research have yielded considerable achievements and provided a framework for further development. Our research has undertaken investigations of real-life problems that are of benefit to both industry and TAFE and explored the possibilities and dimensions for future applied research: in particular, it has focused on the ways in which research and innovation may be channelled into knowledge sharing and technology transfer in collaboration with industry and community, and in the design and delivery of education and training programmes to meet future skills needs.

An exciting dimension to our research over recent years, and this year in particular, has been the achievements of our student researchers. Student involvement in applied research projects has been a largely untapped resource across VET; yet the examples we will share with you in Holmesglen Applied Research '23: the path ahead demonstrates the capabilities of our students, their willingness to embrace applied research as an integral component of their education and training programmes, and the possibilities this presents in adding a further dimension to our applied research landscape.

Three examples of student-based research projects amply illustrate this: two in our environmental studies programme, a Website Redesign and E-commerce Integration project, and course-based research by students undertaking an English language programme. This engagement with research enhances student awareness of industry and community, better prepares them to cope with the uncertainties of a rapidly changing work environment and strengthens the profile of applied research in TAFE.

In **Research'23: 'the path ahead'**, Holmesglen's Centre for Applied Research and Innovation showcases recent research conducted at Holmesglen Institute, our research engagement with industry and community and how this provides a window into current practice and future possibilities for applied research in TAFE

# Holmesglen Research Initiatives

## Selected highlights

### Leading the way

Holmesglen Institute is a recognised leader in applied research and innovation across the TAFE sector. Its growing profile has been enhanced through the Institute's active involvement in sector-wide activities designed to support the consolidation of applied research in vocational institutions.

This has included membership of the Victorian TAFE Association's 'Research and Advocacy Committee', close co-operation with industry and research-based organisations, and a willingness to share its research initiatives through the development and hosting of a nationwide OctoberVET conferences: Applied Research in TAFE during a time of pandemic: the importance of industry partnerships (November 2020); Applied Research in TAFE: current practice and future opportunity (October 2021); and Conducting Applied Research: an invitation to researchers in TAFE (October 2022) and OctoberVET'23: 'the path ahead' (October 2023): its role has also been acknowledged in the Victorian Skills Plan for 2023 into 2024: Shared prosperity through skills (p.60) (Victorian Skills Plan for 2023 into 2024. vic.gov.au (www.vic.gov.au)

In 2023, important pillars supporting these new directions and innovations in applied research have been faculties and centres such as the **Faculty of Health Sciences Youth and Community Studies, the Centre for Energy & Infrastructure, Higher Education, Business Design and Information Technology, Education, Service Skills and Environment, the Library, and the Holmesglen Centre for Applied Research and Innovation.**


### The Holmesglen Centre for Applied Research and Innovation

Established in 2016, the Holmesglen Centre for Applied Research and Innovation is a significant driver of industry-based research as well as supporting the development of an applied research culture at Holmesglen.

Its core function has been to raise the profile of research across faculties and training units and to assist in the development of applied research and innovation projects involving Holmesglen researchers; its focus has been on projects, partnerships, and participation. To achieve this, the Centre has worked towards building the capability of researchers in the Institute; to focus on an inquiry-based approach in our training and education programmes and to ready our learners and trainees for an increasingly digitalised world. It is also cognisant of the need to embrace industry and form partnerships and develop collaborations: in particular, to support engagement with the range of industries linked to Holmesglen through applied research that not only investigates real-life problems, but also helps resolve them.

This is of benefit to both industry and TAFE: it improves courses, has the potential to acquaint teachers and lecturers of new developments, and enhances the technical know-how and industry currency of teachers/trainers.

### 2023: The Centre and Applied Research

During 2023 'the Centre' continued to provide critical support for applied research across the Institute. This support ranged from strategy development and stakeholder relationships to research ethics and research partnerships.

The Centre played an active role in a range of research projects being implemented by our Building 4.0 Co- operative Research Centre (B4.0 CRC) partners, supported faculty led projects, advised Holmesglen researchers on their project proposals, prepared responses to research partnership initiatives with a consortium of universities and TAFE institutes and, in conjunction with the Human Research Ethics Review Panel (HRERP), reviewed a number of external requests by reputable human research ethic committees to conduct research with Holmesglen participants on projects related to building, as well as internal ethics related applications.

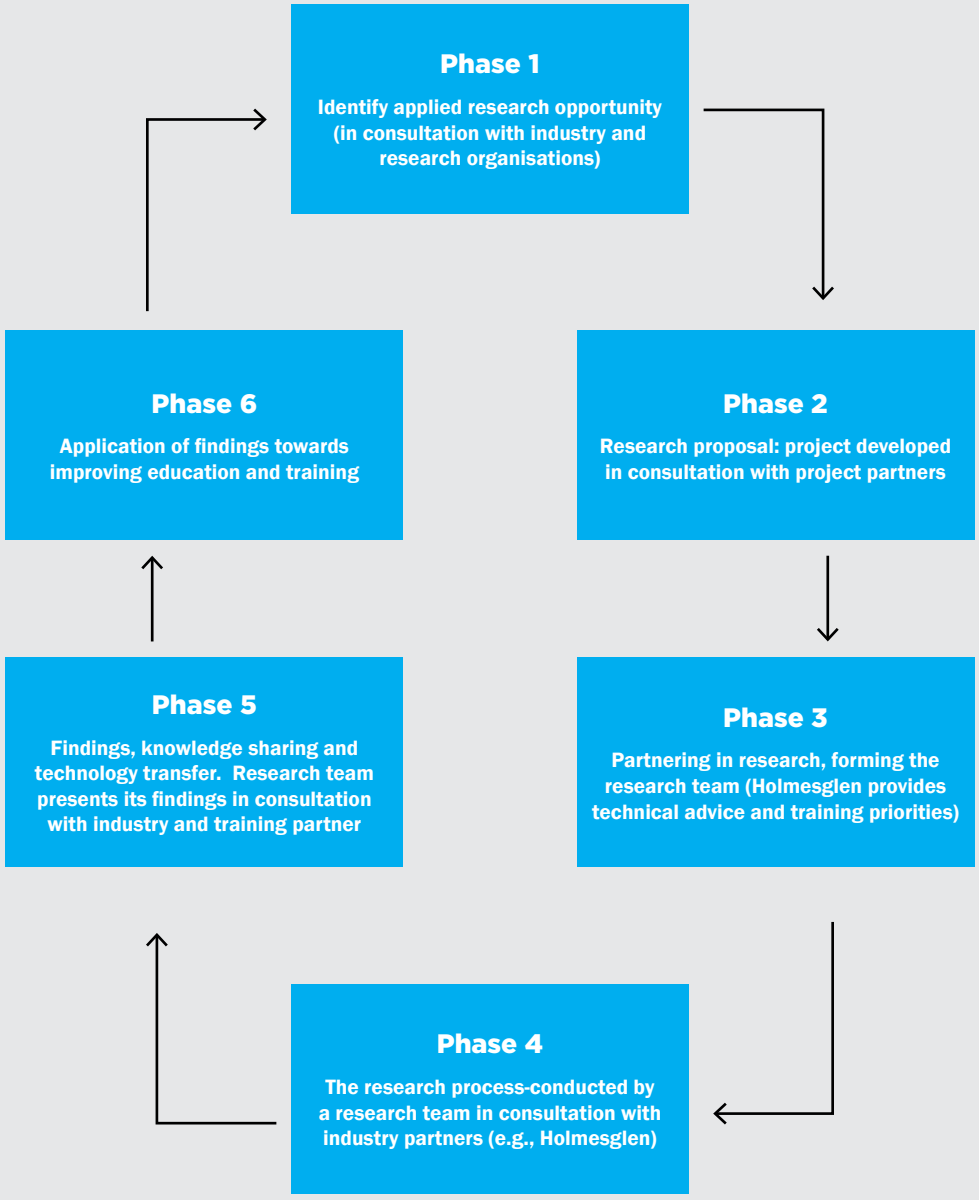
## Holmesglen's approach to applied research and innovation

Holmesglen prides itself upon its approach to research. It seeks to develop a research focus that is industry orientated, outcomes focused, and has the potential to contribute to education and training to equip a workforce for an increasingly digitalised world.

The 'research cycle' captures this process, amplifying the importance of project design, industry partnerships, a team-based approach, knowledge or 'technical' transfer, and application of findings to the improvement of education and training.

## The cycle of applied research: Holmesglen

(Pook, H. 2023)



Dr Sam Duncan (Higher Education and Applied Research), explains Holmesglen's approach to applied research:

"It is the using, doing and testing of research that makes it applied. The outcome must be tangible. It is a very practical way of doing research, as it is not just developing a solution, but also applying it".

## Holmesglen Among the Best: the 'Challenger Project', Holmesglen, and International Best Practice

In 2023, Holmesglen's Centre for Applied Research and Innovation was approached to participate in the 'Challenger Project', a global best practice study co-founded by the European Union and conducted by Danish Technological Institute: its aim was to strengthen the innovation capacity of vocational education and training (VET) by developing a new and sustainable approach to the integration of applied research into VET. The global best practice study presents findings from five international cases demonstrating how applied research can successfully be embedded into education. These findings are meant to serve as inspiration for the next steps in the Challenger project as it aims to develop a new framework guiding the integration of applied research into vocational education and training (VET).

Four of the five cases presented in the best practice study focus on how different educational institutions have used applied research to promote innovation and learning. They include three VET providers, namely **Holmesglen Institute (Australia)**, Copenhagen School of Design and Technology (Denmark) and Saskatchewan Polytechnic (Canada), as well as a university of applied sciences – the Singapore Institute of Technology (Singapore). The fifth case study examines applied research activities by the Waag Futurelab, a foundation focusing on the development of technological and social design skills as well as the promotion of social innovation. A full copy of the report can be found at: https://challengerproject.eu/resources/


*Image: courtesy Challenger Project*

"Applied research fosters the development of new knowledge or the use of existing knowledge and provides our researchers with the opportunity to work on real-world problems, or with new technologies, and changes to work processes".

Dr Henry Pook, (Centre for Applied Research and Innovation).

# Research Projects

**Selected highlights from our range of initiatives demonstrate the strength and diversity of applied research at Holmesglen.**

## Learners as researchers

An integral part of Holmesglen's approach to applied research has been its commitment to learner participation in research, whether it be student/trainee experiences derived from a research-based consultancy, e.g. a 'live-work 'project; staff-initiated projects that allow students to frame the parameters of research and present the outcomes at a conference or industry showcase; or research outcomes derived from work within an industry environment to learn about applied problems and ways to overcome them.

Research projects conducted or reported during 2023 have included industry supported environmental research, information systems research and design of web-based solutions with industry, and student research in fields related to teaching English as a second language.

**Learners as researchers: case studies in environmental applied research: fieldwork research carried out in 2022-3, and 'knowledge transfer' in 2023.**
**(Faculty: ESSE/Environment) The artificial tree hollow monitoring project: co-operative research with industry**

**Background: the industry problem**
Many of Australia's endangered birds and mammals are hollow-dependent species, relying on old-growth forests and trees. A large portion of Australia's old-growth forests have been cleared and efforts to revegetate and re-establish many of these hollow-bearing habitats have been hampered by the time it takes for trees to naturally form hollows.

Recent adoption of artificial hollows in younger non-hollow-bearing trees has been a positive development to help overcome the issue. However, longevity has also proven to be an issue with design flaws leading to tree hollow deformities and callus (wound) regrowth over entrances and cavities filling with water.

To further improve the design and suitability of these shelters for hollow-dependent wildlife, Ecology and *Restoration Australia* has installed 100 newly designed artificial tree hollows and began working with Holmesglen on a collaborative research project to monitor the effectiveness of these designs. This involved ecologists from Ecology and Restoration Australia (Alana Begg and Dr Jo Isaac), Holmesglen Institute staff (Dr Joab Wilson), and students undertaking the Diploma of Ecosystem Management (CEM) qualification from the Glen Waverley campus (in this case Cajsa Knutson Lording, Joshua Markham, Jennifer Currey and Sarah O'Dowd).

**Research Approach**
Holmesglen students, under the direction of Dr Joab Wilson, provided research assistance by monitoring hollows for occupancy by wildlife. This monitoring assistance was facilitated through outside training and certification in a ropes course in tree climbing and canopy access, allowing them to acquire additional qualifications and skill sets and add to their CEM course.

Once trained, the students climbed trees in the forest and set up remote cameras to monitor wildlife inhabiting the hollows. They returned every six weeks to change the batteries and SD memory cards, review the camera images and record the data.

The consultancy firm provided resources in the form of equipment, formal training, as well as supporting learners in the formulation of their own research projects, making project plans, and preparing spread sheets for data collection.

**Research Outcomes:** Skills, Training and Education
Involvement of Holmesglen researchers in data collection gave Ecology and Restoration Australia the opportunity to better monitor the progress of this research project that aimed to secure endangered hollow-dependent animal species.

As the project involved collecting data on rarely studied fieldwork, a subject for which there is currently very little knowledge, analyse data, complete written research reports that would otherwise not be possible in a classroom-setting, develop an understanding of the workflow and project and research management processes that are followed in the industry, and develop an understanding of the importance of industry liaison and applied research methods

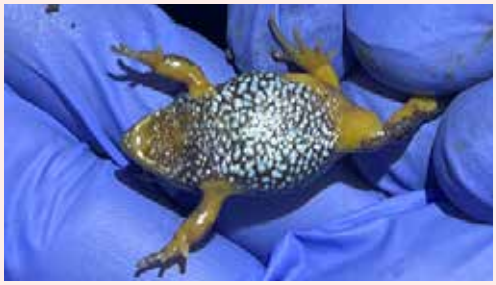
*Extending the pole to reach entrance of hollow.*
*Used with kind permission Dr Joab Wilson © 2023*

*Monitoring artificial hollows: A camera attached to an extendable pole was used to check occupancy of artificial hollows up to 10m high. Wireless monitors were used to view the inside of cavity. Information relating to whether the hollow was occupied, type of species, condition of cavity and nesting material was recorded.*

### Learners as researchers: Southern Toadlet Monitoring Project: A Collaborative Research Project

This project, involving Holmesglen staff (Dr Joab Wilson), CEM students (Mathew Vagg, Maxwell Smith-Small and Harrison Dear David De Angelis) and industry (ABZECO (Applied Botany, Zoology and Ecological Consulting) with researchers: Craig Cleeland (Zoologist and Southern Toadlet expert) and Hansi Wagner (Ecologist).

The students, working in a conservation area known as Devil Bend Natural Features Reserve, undertook intensive surveys of Southern Toadlets and discovered numbers of Southern Toadlets in areas where they had previously not been recorded. This caught the attention of Melbourne's most recognised Southern Toadlet experts who became involved, working alongside the student researchers. The aim is to continue the research by collecting more data on their occurrence and the habitats they are found in, presenting outlines of the research project at the 2023 OctoberVET Conference at Holmesglen.



Viewing patterns on belly of Southern Toadlet.
Used with kind permission: Dr Joab Wilson. © 2022

### Learners as researchers: 'Website Redesign and E-commerce Integration: Bachelor of Information Systems student's applied research'. The Mooshuns' Website Redesign and E-commerce Integration project.

This student-based group research project aimed to enhance Mooshuns' online presence by aligning research-backed design principles and e-commerce strategies with the company's goals of promoting emotional education and cushion products.

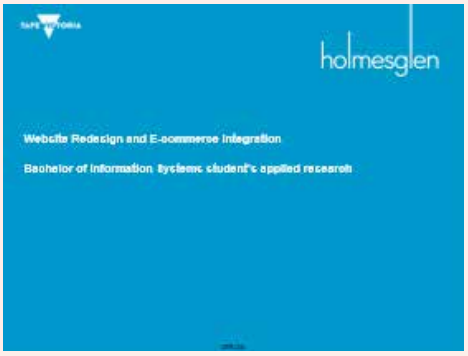
Under the sponsorship of Ian Thomas (Mooshuns) and the project management of Thanawat Chuwong, the project combined web development with robust research methodologies to create a competitive and impactful online platform.

**Research Question**
How can research-informed web design and e-commerce integration enhance Mooshuns' online presence and support its mission of promoting emotional well-being and cushion products?

**Methodology**
The research-informed design guided the creation of a website with user-friendly navigation with E-commerce strategies designed to enhance the online shopping experience and boost online sales.

- This applied research project employed a mixed-methods approach.
- Qualitative research methods, including user interviews, gathered insights into user preferences and needs.
- Quantitative data analysis will assess website performance and e-commerce metrics.

**Outcomes**
By applying research findings to practical web development, the project created a website that not only promoted emotional well-being through publicising the company's product, it also supported revenue growth for Mooshuns.




### Learners as researchers: English language programmes research

Applied Research, focusing on classroom research, is a large part of the Graduate Certificate in Teaching English as an Additional Language (TEAL). As part of the unit "Initiate and lead Applied Research", all TEAL students have to carry out a research project in a class of students enrolled in the Adult Migrant English Program (AMEP) on an area of English as an Additional Language (EAL) learning or teaching and present their findings at a mini conference at the end of the course. Findings presented at the 2023 conference included:

- "In what ways does blended learning improve pre-intermediate second language adult learners' speaking skills?
- Does the audio-lingual teaching method improve simple subject, verb, object sentences for beginner students?
- Do metacognitive reading strategies used in online reading outside the class make students independent and increase comprehension?
- Do second language learners disengage when learning online?
- Does the use of technology affect the collection of immediate student feedback in AMEP".

## Early Childhood Education

### 'Fading notes: The state of music education for the next generation of primary teachers'.

**Funding body:** The Tony Foundation (philanthropic arm of Alberts Music Australia).

This project examines the delivery of music education and access to music learning among Australian primary school students, with a focus on provision for music education in Initial Teacher Education (ITE) courses.

2020-2023.

**Chief Investigators:** University of Sunshine Coast, Edith Cowan University, the University of Melbourne, and ACER. Dr Mary Hughes from Holmesglen participated in data collection for the project and provided feedback on the final draft of the report.


*Holmesglen researchers Dr Mary Hughes and Julie Wright presented findings from their recent study at the* ***Australian Association for Research in Education (AARE) 2023 Annual Conference*** *held at the University of Melbourne last week. Their research investigated the impacts of rapid changes imposed upon staff and learners during the Covid-19 crisis with a focus on the transition to new and innovative approaches to learning and teaching in a post-pandemic environment.*


Holmesglen researcher Dr Mary Hughes was invited to present a paper on research methodologies in education, focusing on the use of the Johari Window as an analytical device in qualitative studies. Mary was joined by colleagues from The University of Melbourne and Deakin University to discuss the use of the Johari Window as a practical and appropriate framework for examining teacher and teacher-leaders' perspectives on Professional Learning for staff.

## Information Systems

The technology landscape is constantly changing, and new technologies are emerging all the time. As technology continues to evolve, researching IT helps the industry to drive innovation, provide a competitive advantage, improve efficiency, and support better decision-making. The most prominent IT research trends are the Internet of Things (IoT), Cloud Computing, Edge Computing, Cybersecurity, Artificial Intelligence (AI), Machine Learning (ML), and Blockchain. Holmesglen IT researchers have been actively engaged in these research trends.

### The Smart AI Garden: a project focussing on education and agriculture in response to climate change.

In October 2023, Dr Akhtar Jalbani (Holmesglen) and Katerina Cernavska (Riga Technical School, Riga Lativa) presented a paper and workshop on the **Smart AI Garden** at the fourth ASEF (Asia Europe Foundation) Higher Education Innovation Laboratory in October 2023 at Fudan University Shanghai, China.

**Applied Research: the Problem**
In response to the impact of climate change on agriculture, the researchers argue that there is a need to explore new technology-based solutions to help mitigate risks and improve local agriculture sector resilience.

The researchers also maintain that there are shortcomings in higher education system in preparing modern agriculture entrepreneurs to solve complex problems that require multidisciplinary knowledge and skills that may range from Science, Technology, Engineering and Maths (STEM) to the Social Sciences. As such, education has the potential to exert a significantly positive effect on the adoption of information intensive technology within the agriculture industry.

**Project Description and Identified Solution**
The focus of this research project has been a technology based solution-the **Smart AI Garden**, a Dendarium of various domains and skills to diffuse AI Knowledge and develop new solutions to empower agripreneurs to develop resilience and seize climate change opportunities.

The research team concluded that ...'In order to improve the higher education systems in preparing modern agriculture entrepreneurs and cultivate complex problem-solving skills, ...the Smart AI Garden is designed to address the problem of low technology adoption in agriculture: a proposed solution is to combine game-based learning by integrating AI and VR as a simulated web-based Lab, and a plantation of a Smart AI Garden as a prototype to create an immersive and cutting-edge learning experience.'

## Sports Media

The research conducted by Sports Degrees in 2023 provides valuable insights into the use of social media and marketing trends, independent and intersectional media, and sport's role in society and the framing of news.

### Investigating alternative and independent sports media platforms that cover women's sport

This project investigates the lived experiences of those working and/or volunteering in independent, alternative sports media platforms that cover women's sports. The emergence of digital media and its capacity to offer alternative and accessible ways to create and distribute content has seen great shifts in the modern media landscape with sports media being no exception.

In the sports media space, specific content is now being created by passionate fans, bloggers and aspiring journalists, adding to an already oversaturated field of sports news, opinion and analysis. As oversaturated as it may be, this space is also affording opportunities for those traditionally marginalised by mainstream media to cover, champion and advocate for sports, athletes and issues that are not reflected in traditional sports media. How independent content creators do this is an important area for research attention as these platforms not only set out to redress the lack of diversity and intersectional approaches to traditional sports media, they often also seek ways to drive even more change as they work on becoming more representative, not only in the content they produce but also in the voices they include and amplify.

This in an interesting and important movement to interrogate as these platforms are predominantly unfunded passion projects created by those marginalised groups who have not been afforded opportunities in traditional media spaces but continue to produce largely unpaid work in the hope of driving change from a bottom-up approach.

**Funding body:** Sport Management Association of Australia and New Zealand
**Holmesglen Researcher:** Dr Sam Duncan
**Industry/external collaborator:** Dr Kasey Symons, Swinburne University _+ 4 x independent media organisations: The Outer Sanctum Podcast, Beyond90, Netball Scoop and Siren Sport.
**Commencement/completion date:** 2022-2023.

### Mapping intersectionality within Victorian sport sector workplaces

**Change our Game**
Using sophisticated AI research tools and an intersectional analysis approach, this project will draw on publicly available data to identify Victorian sport sector workforce and recruitment trends since the establishment of the Office of Women Sport and Recreation (OWSR) in 2016.

**Swinburne Sport Innovation Research Group/ Holmesglen researchers.**
**Industry partner:** ('Change our Game) Victorian Government
**Commencement/completion date:** Jun-23 Aug-24 (In progress).

### The Lived Experience of the Quantified Student

This research project seeks to understand how women Australian Rules footballers' affectively experience digital self-tracking, and what impacts these interactions have on the player's construction of selfhood, identity-making and body as athletes. With these insights the research aims to develop a framework that empowers women footballers to maximise their performance through digital self-tracking, while promoting positive self-image and women athletes' identity.

**Commencement/completion:** Feb-20 Aug-24
**Swinburne Sport Innovation Research Group / Holmesglen Researcher:** Paul Bowell

### English Language Programmes

Dr Oksana King has been working on research that explores the benefits of using personal devices (laptops) in an AMEP classroom and the use of AI for learning various aspects of English language.

Further research in this field has been a project to identify highly qualified TESOL teachers without requisite qualifications for teaching in TAFE and to identify the provision of gap training against Recognition of Prior Learning (RPL) for the Graduate Certificate in TEAL (in partnership with Box Hill Institute).

## Learning Skills Centre

Research into student resources involving a student collaboration survey and consultation with students about the relevance and effectiveness of student resources developed by the Learning Skills Centre and housed in Brightspace.

**Investigators:**
Helen Johnpillai, Paul Smit, Justin Hayes, and Sylvia Zhao.
24/04/2023-15/09/2023.

### Higher Education (Business): mindfulness research

What are the outcomes of mindfulness interventions in students at Holmesglen?
27/07/2023 7/08/2024 (in progress).
**Researchers:** Robyn Neeson and Tammy Casselson

### Higher Education (Hospitality Management)

**Curriculum Research:** the National VET Qualification Reform Dr Warren Guest was seconded as a curriculum consultant to the Victorian Skills Authority (VSA) to undertake research into a project supporting the National VET Qualification Review. This involved working with the Department of Education and Workplace Relations (DEWR) and involved the 13 Jobs and Skills Councils (JSCs) that shape the national VET curriculum.

# Building 4.0 CRC
## (Co-operative Research Centre) and Holmesglen: an innovative research partnership.

## A new dimension to industry-VET applied research

Building 4.0 CRC, established in early 2020, involves a partnership between Holmesglen and an industry-university based consortium to create, through research, an innovation 'ecosystem' in building construction.

Holmesglen has been working with its partner organisations to develop research proposals that will support the development of training programs in the use of new technologies (including digital technologies); innovations to work processes; and policy and regulations improvement.

**For Holmesglen emphasis has been placed upon:**

i. **Integrating Digital Literacy into Trade Training** and the critical factors that need to be considered when deciding what extended reality technologies should be used to augment the training of learners undertaking building and construction programs.

ii. **Modernising building construction and the future of education and training in the 'digital age':** as construction technologies develop and are applied, Holmesglen believes that the industry will require ever more sophisticated and flexible education and training programmes. This projected shift will require the development of education and training programmes to deliver better outcomes needed to prepare a skilled workforce for a knowledge-based economy.

**2023: B4.0 CRC Projects (Holmesglen advisors: Dr Henry Pook and Dr Ross Digby).**
**[All projects include cash and an in-kind component contributed by industry, universities and the Australian Government.]**

**Project #33 (now numbered #90) - Evaluation of the effectiveness of roofing work inspection using Remotely Piloted Aircraft Systems (RPAS).**
This project aims to:1) review best remote inspection practices, 2) evaluate digital technologies for remote building inspections,3) develop a guideline for the effective implementation of suitable technologies for remote building inspections. Project brief under development.

**Industry partners:** VBA, MBAV, Sumitomo Forestry, Holmesglen Institute. (TBC 2024)

**B4.0CRC Shared Interest Project Programme: Project #48: Scoping study for building the future-circular economy-shared interest project.**
The Shared Interest Projects (SIPs) programme is a Building 4.0 CRC (the CRC) Research Project that focuses on an issue of collective concern to which no single industry or research partner can or should tackle single-handedly and allows the CRC to diversify its research profile with projects that fill in the gaps other research does not cover.

SIPs can be taken from inception to active project status quickly; and importantly, these projects complement traditional CRC projects by focusing upon social, cultural, regulatory, or systemic matters and complex problems that are best addressed through the collective agency of the CRC consortium.

SIPs align directly with the CRC's four meta-themes 1) People, Practices and Culture 2) Sustainability 3) Digitalisation, and 4) Industrialisation.

The first scoping study forms a solid foundation on which to plan the necessary steps and actions to enable the transition to a circular economy. Study findings and the resulting roadmap will be widely disseminated to study participants, industry stakeholders and government to catalyse meaningful action.

**Project partners include:** MBAV, Lendlease, A.G. Coombs, Bluescope, Donovan Group, Fleetwood, Holmesglen, Hyne, Utechture, VBA, Sumitomo, Ynomia, Verton, Viridian .
From 2023 until expiry of the GPA Agreement date.

**Project #49 Implications of Industry 4.0 Technologies on Work Practice.**
This project addresses the industry need to better understand the implications of emerging technologies on work practices in the building and construction sectors. It aims to inform the design of work practices and appropriate technologies to create a desirable work environment. For Holmesglen, this project will seek to understand the impact of new technologies on skills and training, and informing interventions to upskill the workforce, improve skills-based training and qualifications structures, manage the risks of deskilling and acquiring and retaining skilled workers. This project is a carry-over from Project #7 (2022).

**Project Partners:** to be confirmed-currently AG Coombs, MBAV, Holmesglen Institute

**Project #56 B4.0 CRC and Cruxes project**
This B4.0CRC Project aims to support the CRC's vision of developing a dynamic and thriving Australian advanced manufacturing sector, by:

- enabling industry to direct and draw on Australian research and technology and
- through a scalable methodology that upskills researchers and industry professionals in collaboration, engagement, and adoption of innovations.

This will maximise benefit to industry from CRC projects and collaborations.

**Project Partners:** B4.0CRC, Holmesglen Institute, Cruxes Innovation, Bluescope, MBAV, VBA, A.G. Coombs, Sumitomo. 2023-2024.

**Project #66: Future of Construction Education (Holmesglen building degree project).**
This research project aims to develop and gain approval for a new bachelor's degree program in the future of construction at Holmesglen Institute and establish the framework for a higher AQF program as required for accreditation.

This research will contribute to the body of knowledge on the future skills required for the building and construction industry and the role of technology and automation in meeting those skills demands. The research will provide valuable insights for higher education institutions in the development of contemporary, forward-looking industrialised construction degrees. It will also have broader implications for workforce development in the building and construction industry, highlighting the skills and training required to meet the industry's changing landscape.

**B4.0 CRC Industry/Government Partners:** * Holmesglen - skills/training/education provider * AG Coombs - services design & fabrication * Lendlease Digital - digital services/ builder * Nexans - supplier * Sumitomo - developer * Victorian Building Authority - building regulator * Master Builders Association of Victoria - peak body/interest group * Fleetwood - fabricator/builder (in kind only). * Victorian Skills Authority - Skills Regulator *

**Research Partners:** B40CRC: Monash University; The University of Melbourne

**# Research project proposal: pre-fabrication construction.**
A research project investigating the need for a purpose driven VET qualification structure focussed on a 'modernised' construction industry (offsite/industrialised construction and onsite assembly).

B4.0 CRC is currently engaged in the development of a bachelor's degree programme in future of construction at Holmesglen Institute (Project#66) and, although this is partly designed to accommodate learners in new technologies (including off-site construction), significant gaps remain in training programmes for off-site construction at the trades and para-professional level. Consequently, Holmesglen is in the process of submitting a proposal to B4.0CRC for a research project to investigate a purpose driven VET qualification structure and/or competency framework focussed on industrialised/offsite construction (Certificates III, IV, and Diploma): ultimately to form part of a suite of education and training programmes (from certificate to degree level) needed to equip the building construction workforce of the future.

**B4.0 CRC Industry Placement Opportunities for PhD students.**

PhD scholarships, offered by B4.0CRC, provide a unique opportunity for researchers from university research partners to work within a leading initiative aiming to transform the building and construction industry.

During 2023 several PhD research projects (five from Monash University and one from Queensland University of Technology) developed research proposals that would utilise the expertise of Holmesglen trained technical staff and students, as well as utilising Holmesglen's extensive workshop facilities. Dr Ross Digby provided industry advice and assisted in the co-ordination of candidate's access to staff, students and research subject facility, where appropriate.

**Projects included:**' curtain wall installation', 'situated visualization of crane lift information for real-time operational assistance', 'data collection for scaffolding construction', 'Lighthouse Project#13-Mixed Reality Carpentry Demonstration', 'the impact of media use on team feedback and team performance on construction projects and, designing an effective training program for roading safety products.

**Curtain wall installation (PhD candidate-Monash University)**

The process being researched is the on-site installation of unitised curtain wall modules. The conventional process is not safe; human workers are required to stand at the open edge of a partially constructed high-rise building and reach outwards to catch a 350Kg crane suspended piece of glass. This research aims to identify the limitations of current and new solutions through interviewing stakeholders of the task.

**Situated visualization of crane lift information for real-time operational assistance (PhD candidate-Monash University)**

This project aims to design a crane lift assistant display that uses situated visualisations to aid operators in Realtime. Situated visualisations are visual representations of data directly integrated into the environment enabling users to better perceive and analyse information in real-time and can range from Augmented Reality (AR) overlays on physical objects or environments to interactive dashboards integrated into specific workspaces.

Data collection for scaffolding construction – Computer vision based-digital twinning of scaffolds for site logistics management (PhD candidate-Monash University)

This project aims to develop a digital twining method using Computer Vision (CV) and Building Information Modelling (BIM) to track and monitor scaffolds and consequently support decision-making related to scaffold management tasks in a dynamic construction environment.

**Lighthouse Project#13-Mixed Reality Carpentry Demonstration (PhD candidate-Monash University)**

This project harnesses Augmented Reality (AR) and Virtual Reality (VR) to enhance prefab component assembly in carpentry and construction. By integrating AR/VR tools like Twinbuild by Fologram, the project aims to improve training and upskilling process, assembly instructions, spatial awareness, quality control, and collaboration. A real-time assembly of a complex timber pavilion will showcase these technologies' efficacy in addressing construction challenges. This project, involving Holmesglen apprentices, was demonstrated at the B4.0 CRC Annual Conference (October 2023). Findings will be disseminated via a Building 4.0 CRC White Paper and an academic conference paper, contributing to advancements in construction practices.

**The Impact of Media use on team feedback and team performance on construction projects. (PhD candidate-Monash University)**

This research aims to investigate the impact of social media use impact on projects and project management, specifically in relation to team feedback and team performance and the potential moderating role of social media practices in construction site activities. This research is going to find the best practices in the context of construction sites in Australia.

**Paving the road for designing an effective training program for roading safety products based on user experience. (PhD candidate-Queensland University of Technology)**

Innovation and safety: this industry placement for a PhD candidate, is to involve research that primarily aims to develop a framework for providing effective training programs to enhance stakeholders' user experience when adopting the selected road safety product [eSeries] (e.g., manufacturers, contractors, traffic controllers, and hire companies) in Australia.

# Building 4.0 CRC Annual Conference 2023

*Image: Building 4.0 CRC and Gemma Swain On Vibe Photography.*

## Holmesglen session: Integrating Digital Literacy into Trade Training with Dr Ross Digby

This session discussed the critical factors that need to be considered when deciding what extended reality technologies should be used to augment the training of learners undertaking building and construction programmes.

## Holmesglen session: Modernising building construction: the future of education and training in the 'digital age' - with Dr Henry Pook and Dr Sam Duncan.

This session discussed the proposition that, as construction technologies develop and are applied, the industry will require ever more sophisticated and flexible education and training programmes. This projected shift incorporated discussion of the research being undertaken to develop education and training programmes that will deliver better outcomes needed to prepare a skilled workforce for a knowledge-based economy

**Holmesglen, as a B4.0 CRC industry and training partner, conducted research related workshops and round table discussions in two areas at the Building4.0 CRC Annual Conference: digital literacy and trade training, and modernising building construction: the future of education and training in the 'digital age'.**

*Image: Building 4.0 CRC and Gemma Swain On Vibe Photography.*

# Construction initiatives: the Building Construction Trades and apprenticeship training

*Source: Holmesglen Institute*

## Innovation projects

Innovation encompasses the widespread application of new knowledge and new work processes and is often accomplished incrementally, to industry and to training programmes. These innovations may include changes to work processes, the testing and application of improvements to products for industry, improved marketing, and revised training to help introduce these improvements.

Work within the Building Construction Trades (BCT) during 2023 has focussed on the development of several innovation projects that include: 'Supporting women to work in the construction industry'; 'Into the future print manufacturing'; 'Future prefabricated modules for all plumbing training and Hydraulic Shoring'; and 'loading glass safely onto the A frame'.

This builds on a number of 2022 initiatives in sustainability, automation of industry sectors such as stonemasonry, timber recycling, and, in an era of skills shortages, measures to improve the attractiveness of the trades for new entrants to the workforce.

## Major Grants

**Supporting women to work in the construction industry**

This project seeks to address the Victorian Government's priority for women in construction. A key priority is students facing gender-based barriers to training (e.g. women seeking to work in traditionally male industries). Victoria's women in construction strategy states- women are active in the Victorian labour market now than in the past, but they make up only 2% of the workers in Australian construction. The intent is for the program to be a pilot program to support women wanting to enter the construction industry. The program intention is to trial a minimum of two groups throughout 2023 and 2024 for women to either gain employment during or at the end of the program or further studies in construction such as an apprenticeship. The program will have a dedicated mentor to work with industry, employment centres, women in trades organisations and women who are seeking to enter the construction industry.

Holmesglen (Elizabeth Jansz), with ICON and Master Builders Association Victoria.

**Grant Program Funding Agreement-Victorian State Government $180,000.**

**Future prefabricated modules for all plumbing training and Hydraulic Shoring**

The intent is to install prefabricated modular sets that align with plumbing industry standards and practices whilst training apprentices and industry in infrastructure plumbing systems such as an Integrated Pump modular set, Integrated Fan Modular set, Horizontal Pipe Modular Set, Fire Modular Set, Hydronic Heating Modular Set to support the delivery of the Certificate III in Plumbing. The scope of these works will: improve understanding and opportunities for apprentices and industry on modular prefabrication used in infrastructure builds; develop skills and knowledge for learners and industry on new technologies and best practice; and continue to position Holmesglen as a leader in construction and infrastructure education.

Holmesglen (Elizabeth Jansz), AG Coombs and Reece,

**Grant Program Funding Agreement-Victorian State Government $500,000**

*Source: Holmesglen Institute*

*Source: Holmesglen Institute*

**Into the future: print manufacturing**

Installation of a Booklet Binder for the Centre of Excellence in Printing that aligns with industry standards and practices whilst training learners and industry in digitised technology.

**Project Scope:** The intent of this project is to purchase, install and conduct training in the use of a Booklet Binding machine for the apprentices in Certificate III in Printing, a thin market trade and industry. The scope of these works will: • Improve digital literacy in line with current industry practices • Increase awareness for learners and industry on current printing practices • Continue to position Holmesglen as a leader in printing education • Deliver training in line with the manufacturing and cabinet making industry expectations.

Holmesglen (Elizabeth Jansz), with Mercury Walch and Flying Colours.

**Grant Program Funding Agreement-Victorian State Government $50,000**

**Load your glass onto the A frame safely**

Certificate III in Glass and Glazing is a specialised thin market program and Holmesglen is the only Metropolitan TAFE provider. Project aims to set up and install a trailer with an A frame for apprentices and industry to practice and learn the required skills to industry standards for loading and unloading glass safely which is an essential task used in both domestic and commercial settings.

The scope of these works will: Improve safe work practice, provide additional training in digital skills for apprentices and industry, continue to position Holmesglen as a leader in apprenticeship training in glass and glazing, deliver training in line with the glass and glazing industry expectations.

Holmesglen (Elizabeth Jansz), Stevens Glass.

**Grant Program Funding Agreement-Victorian State Government $30,000.**

# Health industries: conducting a vibrant research programme


*Source: Henry Pook*

Holmesglen's partnership with Healthscope has provided Holmesglen's **Faculty of Health Sciences, Youth and Community Studies (HSYCS)** with the opportunity to enhance its programme of applied research across the faculty leading to the continuing improvement of its teaching programmes in health and allied sciences and to patient outcomes.

Among the many Holmesglen research projects related to the 'care economy' have been:

- a public-private partnership to prevent falls in Australian hospitals,
- Jasper™: A Virtual Reality Simulation Programme for Vocational & Higher Education in TAFE
- a project to 'establish an interprofessional ward round protocol and education programme for the diagnosis, risk factor assessment, and collaborative management of delirium in post cardiac surgery patients',
- an expansion of the integrated practical placement programme for young people with a disability in conjunction with the Royal Children's Hospital,
- building employer confidence and expanding horizons (disability/education/employment)
- the 'motivations of first year nursing student enrolment during a global pandemic'
- intraprofessional learning
- the Future Ready project (Health/nursing): collaboration with the Victorian Skills Authority for the Care Economy skills lab, and
- the formulation of a Collaborative Online International Learning (COIL) project between Holmesglen Institute in Victoria and Grande Prairie Regional College in Alberta, Canada.

## 2023

Several research projects have been undertaken, or continued, during 2023. These include: the Collaborative Online International Learning (COIL) Project; Skills Labs; Building Employer Confidence and Inclusion in Disability; and an expansion of the integrated practical placement programme for young people with a disability.

*Image: Screen shot from virtual reality scenarios developed in the COIL-project (Holmesglen).*

**The Collaborative Online International Learning (COIL) Project**
This research project has evaluated the development, implementation and outcomes of a COIL program in nursing education established between Holmesglen Institute in Melbourne, Australia and Northwestern Polytechnic (formerly Grande Prairie Regional College) Alberta, Canada. The COIL program has created multiple online environments that have facilitated collaboration, the sharing of resources, and the development and implementation of novel educational and academic experiences for students and faculty.

Four specific research interventions have been developed: 1. An Online Virtual Community (OVC), 2. Virtual Reality/ Virtual Simulations, 3. A Virtual Global Classroom (VGC), and 4. A Virtual Community of Practice (VCoP).

Leveraging from Holmesglen's expertise in educational technologies, simulation and applied research, the outcomes of the project will profile the organisations to a global audience with a view of attracting overseas talent to collaborate on future innovative research and to build Victoria's brand as a pioneering and high-quality education provider in both vocational and higher education.

**Industry partner:**
Northwestern Polytechnic, Alberta Canada
**Holmesglen investigators:**
Kiegaldie, D., Shaw, L., Ciardulli, M. Kenwell, K.
**Industry/external collaborator:**
Evans, T., Jacobson, J.
**Duration:** 2021 - 2023.
**Funding:** Veski-Study Melbourne Research Partnership Grant($185,000)

**Victorian Skills Authority Skills Laboratory**
This project is a partnership with the Victorian Skills Authority to facilitate Skills Labs that will research, develop and test, through piloted and simulated programs, new ways of determining skills in line with contemporary clinical practices in the Health and Community Services sector and formulating education and training responses. New approaches to skills development for the care economy will be designed.

**Industry partner:** Victorian Government: Department of Education and Training.
**Researchers:** Kiegaldie, D., Shaw, L., Ciardulli, M. Kenwell, K., Williamson, C., Koutoukidis, G.
**Grant:** $1,000,000
**Duration:** 2022-2023.

**Expanding the integrated practical placement programme.**
This expanded project aims to extend the IPP program with other TAFE providers in Melbourne and regional Victoria to increase the employment opportunities for young adults with disability and create a framework and operational model for training providers and partner organisations inclusive of student led disability awareness training. It will also conduct a project evaluation to measure stakeholder outcomes and efficacy of the implementation model work-based environment. Participants are supported to transition into paid employment.

The Integrated Practical Placement (IPP) Program provides young adults with disability the opportunity to complete a course in work education whilst being immersed in an authentic work environment.

**Partners:** Partners: Royal Children's Hospital, Melbourne Health, Monash Active, Bendigo/Kangan Institute, SuniTAFE, Melbourne Polytechnic.
**Duration:** 1 year.
**Grant:** NDIS Economic Participation Stream Grant Round 2020-21 ($265,100)
**Researchers:** Kiegaldie, D., Davis, J., Kearney, I., Shaw, L., and Forbes-Nicholson, A. / Koutoukidis, G., Hooper, J., Hull, J.,
**Duration:** 2020-2024 (delayed due to COVID-19).

**Building employer confidence and inclusion in disability**
This project aims to build the confidence and ability of employers to hire, support, and retain employees with disability in a defined geographical/statistical area (Monash). Specifically, the project is focused on young adults with hidden disabilities, though not restricted to this group, and aims to link jobseekers to employment opportunities in the City of Monash.

**Federal Government:** $617,000. 100% Information Linkages and Capacity Building
**Industry Partner:** Monash City Council.
**Researchers:** Dr Gabrielle Koutoukidis, Alyssa Forbes-Nicholson, City of Monash.
**Duration:** 2022-2024

## Nursing

**Development and delivery of a teacher peer review tool to enhance teaching and learning in Higher Education** - a Pilot study in the Bachelor of Nursing course. The project's aim is: to investigate whether there is a need for a teacher peer review tool in Higher Education courses to promote consistent teaching and learning practises? is the teacher peer review tool fit for purpose in the Bachelor of Nursing course? is the tool user friendly and widely accepted by Bachelor of Nursing lecturers and casual teachers? and can the tool be easily adapted for all higher education courses throughout the institution?

**Researchers:** Ann Fisher, Sue Quirk (In progress)

**Research programme informing a podcast series related to the Bachelor of Nursing.**
Interviews with industry experts including MET nurses, ICU nurses, exploring the various roles and responsibilities of nursing staff managing the deteriorating patient.

NSG1104 podcast series interviewing nurses from various specialties, exploring the different roles available for our nursing students in the future. Jul-22 Aug-23

**Researcher:** M. Browne.

*Simulated nursing ward at Holmesglen. Image: Holmesglen*

## Recognition of health research:

**World Federation of Colleges and Polytechnics**
Health related applied research, including the COIL project, falls prevention in Australian hospitals, the integrated practical placement programme for learners with a disability, and the JasperVR simulation for nursing students, was recognised at the World Federation of Colleges and Polytechnics Awards of Excellence in Montreal, Canada in 2023, winning the **Gold Award**.

The COIL team's applied research project (Collaborative Online International Learning) was previously acknowledged in February 2023 at a major showcase in Melbourne. Watch the Showcase Video: https://www.youtube.com/watch?v=js5OyilVVvc

*Above: Chief Executive Mary Faraone (Far left) with Gold Award and Deb Kiegaldie (fourth from right) Clinical Chair – Health Workforce and Simulation, among the evening's winners in Montreal.*

# Establishing a research profile: Holmesglen presentations at conferences, 2023

**The Centre has worked closely with faculties and teaching departments to promote and co-ordinate the involvement of staff researchers in conferences showcasing applied research across the vocational and professional education and training sector.**

Holmesglen researchers gave presentations (keynote speaker, plenary session, round table discussion, parallel paper presentation, poster, workshop) at a range of virtual and in-person conferences during 2023. This included AVETRA (Australian Vocational Education and Training Research Association) conferences; NCVER (National Centre for Vocational Education Research) Conferences; OctoberVET at Holmesglen; and other conferences, both national and international.

## OctoberVET at Holmesglen: part of the Holmesglen research landscape.

OctoberVET is an important opportunity for Holmesglen researchers, industry, research-based organisations and other TAFE's to share research, contribute to the improvement of teaching and learning and provide the groundwork for further research and innovation.


## Holmesglen and OctoberVET: 2019-2023

**OctoberVET 2019 at Holmesglen: 'Showcasing Applied Research in TAFE'.**

The conference showcased a range of research projects and applied research partnerships between TAFE and organisations such as the Royal Children's Hospital; research snapshots from leading applied researchers, demonstrations of new technologies such as virtual reality and their application to education and training demonstrated the TAFE's potential contribution to the development of industry and 'cutting edge' training programmes.

**The 2021 OctoberVET conference: 'Applied Research in TAFE: Current practice and future opportunity.'**

This conference was based on investigations of real-life problems that are of benefit to both industry and TAFE and explored the possibilities and dimensions for future applied research: in particular, the ways in which research and innovation may be channelled into knowledge sharing and technology transfer in collaboration with industry and community, and in the design and delivery of education and training programmes to meet future skills needs.

**OctoberVET 2020 at Holmesglen: 'Applied Research in TAFE during a time of pandemic: the importance of industry partnerships.'**

This virtual conference drew upon the theme of applied research in TAFE during a time of pandemic and reinforced the importance of industry partnerships. Speakers emphasised the view that TAFE has the capacity to play a significant role in the development of industry supported innovation and meeting future skills needs: rather than seeing the pandemic as an impediment to change, TAFEs could embrace these new challenges and opportunities by capitalising upon the possibilities presented by new technologies and increased digitalisation across many industry sectors.

**The 2022 OctoberVET conference: 'Conducting applied research: an invitation to researchers in TAFE.'**

This conference provided a programme of presentations and workshops focussing on issues related to the conduct of applied research. Designed for researchers currently engaged in applied research or who are thinking about doing research for the first time, the conference focused on practical issues related to applied research for Holmesglen researchers and researchers from across Victoria and interstate.

## OctoberVET 2023

OctoberVET 2023 presented several research projects showcasing directions in TAFE-based research.

OCTOBERVET

LOCAL VET • SHARING KNOWLEDGE

**OctoberVET'23: 'the path ahead',**

Thursday 26th October 2023, 9:30am-3:30pm

**We invite you to join Holmesglen's Centre for Applied Research and Innovation for OctoberVET 2023: 'the path ahead'.**

It has been almost a decade since the idea of TAFE-based research was heralded as part of the VET landscape. Fashioned to focus of the applied nature of research projects, and firmly embedded in an industry context, these early steps in research have yielded considerable achievements and provided the context for future development: we now look to extend and enliven the possibilities of applied research.

Holmesglen's OctoberVET'23: 'the path ahead', presents several research projects to showcase some of these new directions in TAFE-based research. It will be conducted both face-to face and through Webex.

Our Team

The Holmesglen Institute team presents several research projects showcasing the possibilities of applied research and new directions in TAFE-based research: Dr Henry Pook, Dr Ross Digby, Dr Warren Guest, Tammy Casselson, Dr Joe Pagnoccolo, Dr Joab Wilson, Dr Sam Duncan, Rashikala Weerawarna, Andrew Williamson, and students from Environmental Studies, and IT.

**The conference will be conducted both face to face at the Chadstone Campus, Holmesglen Institute, Lecture Theatre, C1.1.33, and via Webex.**

**Registration for all participants.**

https://holmesglen.webex.com/weblink/register/r9c2167d1f2d007aece5d7ae9f2f3c9e6

Dr Henry Pook, Director, Centre for Applied Research and Innovation. Holmesglen Institute.

AVETRA holmesglen TAFE VICTORIA

For further information, contact Dr Henry Pook: henry.pook@holmesglen.edu.au

## October 2023: 'the path ahead'

- The 'path ahead': reflections on the past decade (Dr Henry Pook)
- Applied Research: new frontiers for research (Dr Sam Duncan)
- Applied Research: the wellness challenge (Tammy Casselson)
- Industry Collaboration: beyond education & training. (Dr Ross Digby)
- Learners as researchers: Design and develop websites. Implement the e-commerce system to Mooshuns: (Rashikala Weerawarna and student researcher, Chuwong Thanawat)
- Apprenticeships: new directions: (Dr Warren Guest)
- Well-being; a new frontier for research: the apprentice experience (Dr Joe Pagnoccolo)
- Learners as researchers: a case study of environmental research (Dr Joab Wilson and student researchers: Cajsa Knutson Lording, Jennifer Currey, Joshua Markham, Sarah O'Dowd).
- Forward challenges: Applied Research and the Victorian TAFE Network (Andrew Williamson).

## Presentations

Bowell, P., 'Behind the numbers: Women Australian Rules footballers' lived experience of performance monitoring ', (Swinburne Sport Innovation Research-including Holmesglen), International Women Symposium, presentation, Western Sydney University, Paramatta (Aug-23).

Bowell, P., 'Have you ever stopped to think how does this background tracking make you feel?' (Swinburne Sport Innovation Research-including Holmesglen), presentation, The University of Sydney, Sydney (Sep-23).

Bowell, P., 'Understanding digital self-tracking among women Australian Rules footballers', (Swinburne Sport Innovation Research-including Holmesglen), SMAANZ 2023, presentation, The University of Canberra, Canberra (Nov-23).

Casselson, T., Neeson, R., 'Do Mindfulness Interventions Help Higher Education Students to Flourish', International Positive Psychology Congress 2023 poster presentation, Vancouver, Canada (20-23 July 2023).

Casselson, T., 'Embedding Mindfulness & Wellbeing into VET & Dual Sector', OctoberVET presentation/keynote, Holmesglen, Melbourne, (26-Oct-23).

Chung, C., 'Stereotypes: when assumptions are the Mothers of All ****Ups ALIA Multicultural Webinar, presentation and Webinar hosting, Australia (June 30, 2023).

Chung, J., ALIA VET Libraries Australia Conference 2023 Mission Possible: The Rise of Institutional Repository in TAFE, presentation, (November 8, 2023).

Ciardulli, M., Kiegaldie, D., "Ella does not like needles"- a simulated learning experience for pathology students ', 9th International Clinical Skills Conference Theme: "Together" with a focus on diversity and inclusion in medical/nursing education, presentation, Prato, Italy (21-24 May 2023).

Ciardulli, M., Kiegaldie, D., "She says her name in Grace;" working with and learning from transgender simulated participants',9th International Clinical Skills Conference Theme: "Together" with a focus on diversity and inclusion in medical/nursing education, presentation, Prato, Italy (21-24 May 2023).

Ciardulli, M., Kiegaldie, D.,' Poster Presentation: e-poster', 9th International Clinical Skills Conference Theme: "Together" with a focus on diversity and inclusion in medical/nursing education, Prato, Italy (21-24 May 2023).

Digby, R., 'Strategy for Skills & Training', plenary, Building 4.0 CRC Annual Showcase National University of Melbourne, Melbourne, (22/03/2023)

Digby, R., 'Training the Future Tunnelling Workforce', Ministerial Presentations: Workforce Training Innovation Fund, keynote, (Online), (8/06/2023).

Digby, R., 'The clean economy workforce' TAFE Talks: Skills Development for the clean energy economy', plenary, (Online), (21/06/2023).

Digby, R., 'Skills for the transition to the clean economy', Victorian Electrical Senate Annual Conference State, Welcome & keynote, Holmesglen @ Eildon (18/09/2023).

Digby, R., 'From linear to circular' Inside Construction Expo, plenary, Melbourne Convention & Exhibition Centre, (21/09/2023)

Digby, R., 'Integrating Digital Literacy into Trade Training', B4.0CRC Annual Conference, Round Table presentation and discussion, Melbourne (11-Oct-23).

Digby, R., 'Using Extended Reality technologies in Vocational Education', Building 4.0 CRC Annual Conference, workshop, Monash University, Caulfield, (12-Oct-23).

Digby, R., 'Skills & Training for the clean economy', plenary, All Energy Conference National Convention & Exhibition Centre, Melbourne (25/10/2023).

Digby, R., 'New Learning technologies in WHS training', MBAV Industry Breakfast, plenary, The Glasshouse, Melbourne (26/10/2023).

Digby, R., 'Industry, technology, and new research horizons: the Victorian Tunnelling Centre & Industry Education', OctoberVET (Holmesglen), Presentation, Melbourne (26-Oct-23).

Digby, R.,' Using Extended Reality technologies in Vocational Education', International Mining & Resource Conference, plenary, International Convention and Exhibition Centre: Sydney (2/11/2023).

Digby, R., 'The Victorian Tunnelling Centre: An Industry Education City for Tunnelling Construction & Operations Australasian Tunnelling Conference, plenary, Aotea Centre Auckland, New Zealand 8/11/2023.

Duncan, S., 'Navigating Fandom: How user generated content reflected the conflicting emotions of sport's importance during COVID-19.' Conference on Sport and Society, Plenary, Las Vegas 7-8 June 2023.

Duncan, S., 'Alternative and independent sports media platforms and women's sport', Sport Management Association of Australia and New Zealand (SMAANZ), plenary, Canberra Nov 29 - Dec 1, 2023.

Duncan, S., 'Applied Research: New Frontiers for Research', OctoberVET, plenary, Melbourne Oct-23.

Faulkner, E., Karg, A., Robertson, J., & Sendjaya, S., (Swinburne Sport Innovation Research-including Holmesglen), 'The role of leaders in gender equity: how do they influence change?', North American Association for Sport Management International, parallel presentation, Montreal, Canada (30 May-04 June)

Faulkner, E., Karg, A., Robertson, J., & Sendjaya, S., (Swinburne Sport Innovation Research-including Holmesglen), 'Leading change towards gender equity: disrupting the status quo', Sport Management of Australia and New Zealand, Parallel presentation session, Canberra, Australia (30 Nov-2nd Dec).

Greig, L., IPA 'Managing the ATO ', IPA, Victorian Congress Cape Schanck, presentation, (April23).

Greig, L., IPA Tax Retreat, presentation (multiple sessions), Darwin (May-23).

Greig, L., 'Taxing of Crypto', IPA Crypto Conference, presentation, Melbourne (Oct-23).

Greig, L., 'Superannuation', IPA National Congress, presentation, Sydney (Nov-23)

Guest, W., 'VET curriculum design: A critical analysis of the many voices and intentions that shape learner knowledge', AVETRA 2023 Theme: VET + Challenging times: Challenges of our time and Challenges that lie ahead, presentation, Melbourne, (27/04/2023).

Guest W., 'VET learners as curriculum co-designers: examining the realities, opportunities and prospects', AVETRA 2023 Theme: VET + Challenging times, Challenges of our time and Challenges that lie ahead, presentation, Melbourne, (28/04/2023)

Guest, W., 'Lifting apprentices engagement', Victorian Skills Authority, workshop, Melbourne (21/05/2023).

Guest, W., 'National Vocational identity formation', ACER, Workshop, Melbourne, (15/06/2023).

Guest, W., 'The Australian VET curriculum', University of Konstanz, workshop, Konstanz, Germany (05/07/223).

Guest, W., 'VET learners as curriculum designers: placing apprentices at the centre of their training curriculum', JVET conference presentation, Oxford, England (14/07/2023).

Guest, W., 'Developing vocational identity in food trades apprentices', OctoberVET – Box Hill, presentation, (6/10/2023).

Guest, W., ''The future of VET curriculum', OctoberVET – VDC, presentation, Melbourne (20/10/2023).

Guest, W., 'Developing vocational identity in food trades apprentices', Victorian Skills Authority, workshop, Melbourne (25/10/2023)

Guest, W., 'Developing vocational identity in food trades apprentices' OctoberVET – Holmesglen, presentation, Melbourne (26/10/2023).

Guest, W., 'Apprenticeships: new directions', OctoberVET (Holmesglen), Presentation, Melbourne, (26-Oct-23).

Hughes, M., 'Learning and teaching in the COVID era and beyond: challenges and opportunities in a mixed sector economy', AVETRA 2023 Theme: VET + Challenging times, Challenges of our time and Challenges that lie ahead, presentation, Melbourne, (27-28 April 2023).

Hughes.M., 'Looking through a Johari Window: Professional learning in early childhood education'. AARE 2023 Conference, plenary, Melbourne (27/11/2023).

Hughes, M. and Wright, J., 'Transitioning to a new way of doing things: A post-pandemic future for online learning in VET and HE', AARE 2023 Conference, plenary, Melbourne (29/11/2023).

Kenwel, K., 'New ways of learning through digital and simulation-based education', ASPIRE poster, Melbourne, (August 2023).

Kenwel, K., 'New frontiers in vocational education: Using design thinking to create a reimagined Diploma of nursing' ASPIRE, poster, Melbourne, (August, 2023).

Kiegaldie, D., Horseman, D. and Turick, M., "Nothing about me without me" - the indigenous voice in an international nursing education collaboration' World Congress for the World Federation of Colleges and Polytechnics Theme: "Collective Intelligence", presentation, Canada (23-25 April 2023).

Kiegaldie, K, and Shaw, L., 'A Virtual reality simulation education program for nursing students', World Congress for the World Federation of Colleges and Polytechnics Theme: "Collective Intelligence", presentation, Canada (23-25 April 2023).

Kiegaldie, D, and Shaw, L., 'Developing work skills and employment opportunities for young people with disability', World Congress for the World Federation of Colleges and Polytechnics Theme: "Collective Intelligence", presentation, Canada (23-25 April 2023).

Kiegaldie, D., Evans, T., Shaw, L., 'Collaborative online international learning: An Australian and Canadian intercultural nursing education partnership', Congress for the World Federation of Colleges and Polytechnics Theme: "Collective Intelligence", presentation, Canada (23-25 April 2023).

Kiegaldie, D., Ciardulli, M., 'Collaborative online international learning: developing intercultural and global health skills for nursing students and faculty', 9th International Clinical Skills Conference, Theme: "Together" with a focus on diversity and inclusion in medical/nursing education International', presentation, Prato, Italy (21-24 May 2023).

Kiegaldie, K., 'The role of hospitals in developing work skills for young people with disability', 9th International Clinical Skills Conference Theme: "Together" with a focus on diversity and inclusion in medical/nursing education, presentation, Prato, Italy (21-24 May 2023).

Kiegaldie, D. Ciardulli, M., 'Winning hearts and minds: motivating students for healthcare careers', 9th International Clinical Skills Conference Theme: "Together" with a focus on diversity and inclusion in medical/nursing education, presentation, Prato, Italy (21-24 May 2023).

Kilburn A., 'Going beyond the minimum requirements for compliance in ELT qualifications' NEAS (National ELT Assurance Scheme), Panel discussion, Sydney, (4-5 May 2023).

Kim, A., 'Wound management', CAN, presentation, Melbourne, (5/6/23-6/6/23)

Meeking, C., 'No, we don't just read books! Positioning the library at the heart of the institute', ALIA VET Libraries Australia Conference 2023, presentation, (8 November, 2023)

Nallasamy, M., 'Setting up a large scale interprofessional learning program for pre-registration healthcare students' Workshop, Holmesglen Institute, 2023.

Nallasamy, M., 'Vocational Education and Training (VET) System and Social Justice in Australia', Institute of Electrical and Electronics Engineers (IEEE), International Conference on Teaching, Assessment and Learning for Engineering, poster, Auckland NZ, (30/11/2023).

Pagnoccolo, J., 'A quantitative study of social and emotional learning in vocational education and training', AVETRA 2023 Theme: VET + Challenging times, Challenges of our time and Challenges that lie ahead, presentation, Melbourne (27-28 April 2023).

Pagnoccolo, J., 'Social and emotional learning for VET, the Australian context', NCVER Conference, presentation, Melbourne (19-21 July 2023).

Pagnoccolo, J., 'Well-being: a new frontier for research: social and emotional learning and apprentices', OctoberVET (Holmesglen), Presentation, Melbourne (26-Oct-23)

Perkins, D. Shen, R and Deng, C., 'Transnational Education at Holmesglen', ASPIRE, Poster presentation, Melbourne (August 2023).

Pook, H., 'Building VET institutional research capability', AVETRA 2023 Theme: VET + Challenging times, Challenges of our time and Challenges that lie ahead', panel discussion, Melbourne (27-28 April 2023).

Pook, H., 'The modernisation of building construction: the future of work and training in the 'digital age', NCVER 'No Frills', Skilling Australia's Current and Future workforce, presentation Melbourne (19-21 July, 2023).

Pook, H., 'Research and Innovation: designing the future', Higher Education Seminar, presentation, Melbourne (5-May-23).

Pook, H., 'Duncan, S, Empowering Applied Research and Innovation: Unlocking the Potential', ASPIRE presentation/ workshop, Melbourne/Caulfield (25-Aug-23).

Pook, H., 'Reflections on the research project: the path ahead', OctoberVET (Holmesglen), Keynote, Melbourne (26-Oct-23).

Pook, H., Duncan, S., 'Modernising building construction: the future of education and training in the 'digital age', B4.0CRC Annual Conference, Roundtable discussion and presentation Melbourne (11-Oct-23).

Stafford, J., 'Delivering TNE in the host country language: Case studies from around the world', International Education Association of Australia - Transnational Forum 2023, panel, Melbourne (July 27-28).

Stafford, J., 'Providing responsive solutions to industry: The evolution of TAFE micro credentials', International Education Association of Australia - Transnational Forum 2023, panel, Melbourne July 27-29.

Voudouris, S., 'Beyond Paper - the evolution of digital credentials', TAFETalks, Panelist (online) (30/08/2023).

Shaw, L, Kiegaldie, D., 'Building and maintaining strong industry partnerships for best practice falls prevention education and practice', World Congress for the World Federation of Colleges and Polytechnics Theme: "Collective Intelligence" presentation, Canada (23-25 April 2023).

Wilson, J., student research team (Cajsa Knutson Lording, Joshua Markham, Jennifer Currey and Sarah O'Dowd), 'Learners as researchers: case study of environmental research with industry', OctoberVET (Holmesglen), Presentation, Melbourne (26-Oct-23)

Weerawarna, R., student researcher (Thanawat Chuwong), 'Learners as researchers: case study of IT research with industry (Mooshuns)', OctoberVET (Holmesglen,) Presentation, Melbourne (26-Oct-23).

Weerawarna, R & Miah, S., 'A real-time Data-Driven Decision Support with predictive abilities for financial transactions', Australasian Conference on Information Systems (ACIS 2023), presentation, Victoria University of Wellington, New Zealand, (Dec-23).

Williamson, A., 'Forward challenges: research initiative', OctoberVET Holmesglen, presentation, Melbourne (26-Oct-23).

Wilson, A., 'She says her name is Ella: navigating transgender inclusion in simulation with student nurses', STARS, presentation, Brisbane, (4/07/2023).

## Published Research

**Holmesglen researchers seek to report their work through a range of publications to inform discussion, contribute to the improvement of teaching and learning, and provide the groundwork for further research and innovation.**

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Bowell, P (2023) 'How do digitised sporting metrics feel? The affective experiences of women Australian Rules footballers', (nd) Routledge.

Chaudhari, T.U., Patel, V.B., Thakkar, R.G. and Singh, C., (2023). Comparative analysis of Mamdani, Larsen and Tsukamoto methods of fuzzy inference system for students' academic performance evaluation. International Journal of Science and Research Archive, 9(1), pp.517-523.

Connor, J., Mc Alister, M., (2023) 'The Recycling, Reusing, and Repurposing of Nursing & Medical Equipment in Nursing Education' Australian Nursing and Midwifery Journal, May3, 2023

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Dempster, P., Hutchinson, A., Oldland, E., and Bouchoucha, S., (2023) 'Impact of the COVID-19 pandemic on emergency department team dynamics and workforce sustainability in Australia: a qualitative study' International Emergency Nursing, 2023, vol.71 p.1-7

Digby, R., (2023 'The Clean energy Generation: Workforce Needs for a net zero economy' https://www.jobsandskills.gov.au/publications/the-cleanenergy-generation.(Digby, R.,-Steering Group member).

Duncan, S., Simmons, K., Duncan, S., Karg, A., Wymer, S., & Sherry, E. (2023). 'Navigating fandom: how user generated content reflected the conflicting emotions of sport's importance during COVID-19' Sport in Society, 1–20. https://doi org/10 1080/17430437 2023 2273864

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Guest, W., (2023) 'Apprenticeship training curriculum: examining its negotiated design and the ensuing effects on learner engagement', Journal of Vocational Education & Training, 75:5, 1092, DOI: 10.1080/13636820.2023.2246325 BHM/HE

Guest, W. (March, 2024) 'Building vocational identity: a comparative study of the Swiss and Australian VET curriculum', Research Today, 2024, 5-6.

Gutierrez-Bucheli, L., Goh, Jian Tsen., Rashidi, A., Duncan Maxwell, D., Digby, R., Fang, Y., Pook, H., and Arashpour, M., (2023) 'Adopting Immersive Technologies in Construction training: Determining Educational Decision-Making Criteria through a Delphi Technique' in Smart and Sustainable Built Environment, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/SASBE-08-2023-0202.

Hughes, M., (2023).'Child-centred pedagogy in early childhood education: The Montessori and Reggio Emilia approaches'. Institute of Specialised Skills (ISS) Publishing. ISBN 978-06456929- 7

Jalbani.A.A, Werrawarna.R & Nuganesh.K (2023). 'Enhancing Data Provenance in AI with Blockchain Technology: A Comprehensive Quality Model'. In the CSI Transactions on ICT, (Springer).

Kiegaldie, D, Shaw, L, and Weerasekara, I., 'Investigating the effects of intraprofessional learning in nursing education: protocol for a longitudinal study' Nursing Reports. vol. 13(2) p. 740-750

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Pook, H., Duncan, S., Kiegaldie, K., Dr Joab Wilson, J., (2023) 'Case study report on best practice: Holmesglen Institute', Challenger Project: Fostering Innovation through applied research: global best practice study, Danish Technological Institute, Centre for Policy and

Business Development: https://challengerproject.eu/resources/

Sherry, E., Bowell, P., Symons, K., & Pankowiak, A. (2023). 'Researching women in sport development: an intersectional approach'. Sport in Society, 27(5), 820–842. https://doi.org/10.1080/17430437.2023.2278614.

Singh, C., Thakkar, R., Weerawarna, R. and Patel, V.B., 2023. Machine learning practices in accounting and auditing. International Journal of Science and Research Archive 10(1) pp 131-162.

Singh, C., Thakkar, R. and Warraich, J. 2023. 'IAM Identity Access Management—Importance in Maintaining Security Systems within Organizations'. European Journal of Engineering and Technology Research. 8, 4 (Aug. 2023), 30–38. DOI: https://doi.org/10.24018/ejeng.2023.8.4.3074.

Singh, C., (2023). 'Machine Learning in Pattern Recognition'. European Journal of Engineering and Technology Research 8(2) pp 63-68

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Singh, C., (2023) "Predicting Stock Price Movement Using Sentiment Analysis and CandleStick Chart Representation", Asian. Journal. Social. Science. Management. Technology.2023; 5(3): 1- 18.

Standley, C., Nursing Assessment and Management of Endocrine Health (chapter) in Koutoukidis, G., & Stainton, K. Tabbner's Nursing Care (9th ed.). Elsevier Australia. (to be published, 2024).

Weerawarna, R., & Miah, S., (2023). 'A real-time Data-Driven Decision Support with predictive abilities for financial transactions'. Australasian Conference on Information Systems (ACIS 2023), Wellington, New Zealand.

Weerasekara, I., Hall, M., Shaw, L., and Kiegaldie, D., (2023) 'Instruments evaluating the quality of the clinical learning environment in nursing education: an updated systematic review', Nurse Education in Practice 2023, vol.71.

Wilson, A., (2023) (as reviewer) Mental Health in Nursing: Theory and Practice for clinical Settings Elsevier Ltd (to be released 2024).

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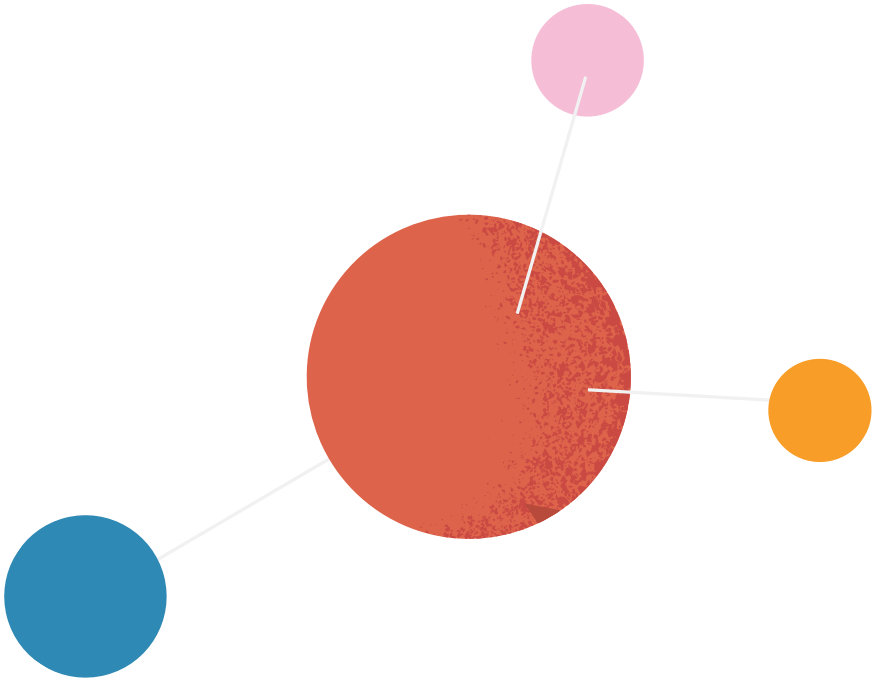


# Research Studies: Completed or in Progress.

## Dr Ross Digby

**'Training Collaborations for Mega-Projects International Tunnelling Association/Australian Tunnelling society'.**

The purpose of this project is to gain a deep understanding of how education and training organisations collaborate with infrastructure mega projects. On these projects there may be one or more companies who have entered a joint venture who have a wide range of education and training demands. To gain this understanding it is intended to visit tunnelling education and training organisations to gain an understanding of how they collaborate for mega projects. It is also intended to present how the Victorian Tunnelling Centre has collaborated on Victoria's Big Build Projects, to gain feedback and input on developing a collaborative model that works within Australia's education and training frameworks.

Oct-23 Oct-24

## Tammy Casselson

The aim of Tammy's Fellowship is to share, learn and build connections to discover possibilities to implement mindfulness into the Australian Vocational and Dual-education sectors for wellbeing and success. She will engage with experts from over 50 countries, about Mindfulness and Flourishing, at the IPPA (International Positive Psychology Association) Congress in Vancouver.

Mindfulness is recognised as both a competency and a state of being. It is the deliberate act of paying attention, while remaining non-critical and open minded. It allows the user to stay on task, focused and motivated. Research shows mindfulness improves mental health, performance, and attrition rates. Tammy's Fellowship will investigate how these results could be gained in the Australian Vocational and Dual-education sectors.

## International Specialised Skills Institute (ISSI) Fellowships.

Fellowships, in a range of categories, are offered each year by the ISSI and support recipients to undertake research and skills enhancement with the aim of creating '... a more responsive, innovative, industry driven approach to up-skilling of the Australian workforce for the global marketplace.

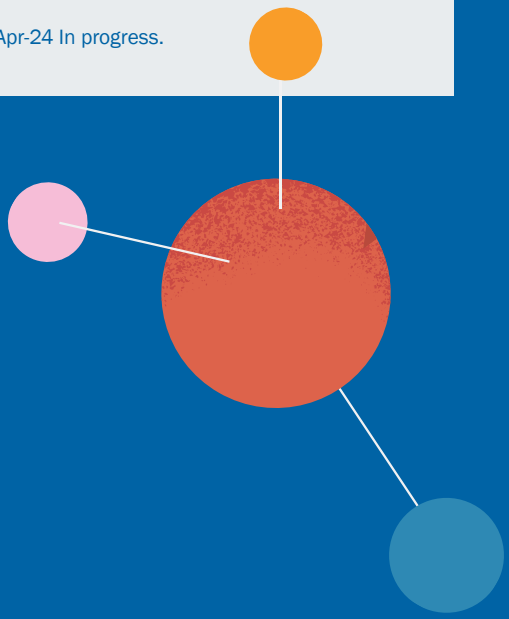
During 2023, three fellowships were awarded to Holmesglen researchers: Dr Ross Digby, Dr Warren Guest , and Ms Tammy Casselson.

## Dr Warren Guest

**'Developing vocational identity in apprentice learners: an examination of the Swiss and German apprenticeship systems'.**

Warren Guest SFUVET - Switzerland; the University of Konstanz, Germany The current Australian VET curriculum of Training packages is focused on the development of skills and knowledge for occupations. Occupations are labelled classifications of work forms that encompass a series of facts, outcomes, goals, and practices. Vocations are differentiated and understood as a personal undertaking to engage with an occupation. The research fellowship examined international models of VET delivery that foster vocational identity and belonging. It will present recommendations for reforming the current Australian VET curriculum and RTO course delivery.

April 2023 Apr-24 In progress.



## 2020-2022

**Holmesglen staff have completed original research in fulfillment of the requirements of the degree of Doctor of Philosophy and Doctor of Education**

- **McKinnon, S., Building organisational adaptive capacity in a volatile post-secondary education context, EdD, University of Canberra, 2022.**
  This thesis is centred on building adaptive capacity in one faculty of a post-secondary education institution. Using Eichholz's (2014) adaptive capacity framework, the study aimed to evaluate the faculty's existing level of adaptive capacity, then implement a mechanism to build capacity to harness opportunities.
- **Guest, W. Apprenticeship training curriculum: examining its negotiated design and the ensuing effects on learner engagement. PhD Thesis, LaTrobe University, 2022**
  This thesis examined the problem of apprenticeship non-completion. Through a lens of vocational curriculum design, Warren investigated the creation and enactment of VET curriculum and its impact on the apprentice training experience
- **Digby, R., Entrepreneurial Leadership in the Mixed Sector Provider, EdD, University of Canberra, 2021**
  This study utilized a convergent parallel mixed methods design to examine the role of, and the capabilities demonstrated by staff in leadership roles at a mixed-sector provider.
- **Farnes, T., An exploration of workplace tension: perspectives of VET and Higher Education teaching staff in a mixed sector TAFE Institute in Australia, EdD, University of Canberra, 2020.**
  This research investigated the nature of tension between VET and HE teaching staff associated with the expansion of higher education programs at a mixed sector Australian TAFE Institute
- **Koutoukidis, G., The role of interprofessional education in vocational and higher education, EdD, University of Canberra, 2020.**
  This study reports on findings from an action research project that explored the role of intra-professional education in vocational and higher education.

## 2023: in progress

- **Jalbani, A., Co-Supervisor for Khalid Hussain, Masters in Information Technology, Sindh Agriculture University.**
- **Stanguts, C., 'Evaluating nutrition knowledge/ literacy in the nursing curricula'. Master of Research in Human Nutrition, Deakin University.,**
- **Bana, Fatima, 'Effectiveness of Virtual Simulation in preparing nursing students for clinical practice', PhD (nursing), La Trobe University (2022 -2029).**
- **B4.0CRC: research project placement at Holmesglen of PhD students from our university partners through the B4.0 CRC research initiative: in consultation with Dr Ross Digby. Research projects include:**
  - Curtain wall installation
  - Situated visualization of crane lift information for real-time operational assistance
  - Data collection for scaffolding construction – Computer vision based-digital twinning of scaffolds for site logistics management
  - Lighthouse Project#13-Mixed Reality Carpentry Demonstration
  - The Impact of Media use on team feedback and team performance on construction projects.
  - Paving the road for designing an effective training program for roading safety products based on user experience.

# The Holmesglen Human Research Ethics Review Panel (HRERP)

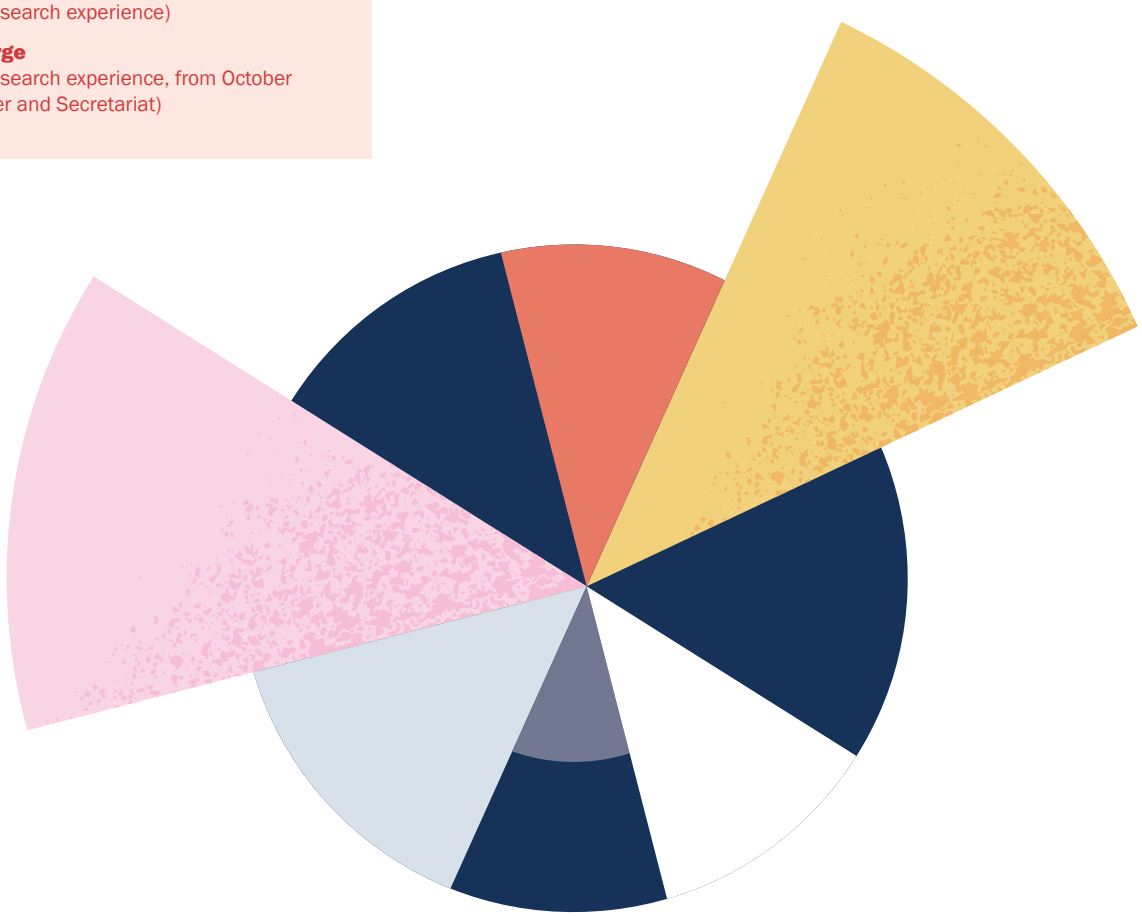
## 2023 membership:

- **Dr Henry Pook**
  (Chair, Centre for Applied Research and Innovation)
- **Dr Estelle Irving**
  (OTL member and Secretariat)
- **Dr Geoff Beeson**
  (External academic)
- **Karen King**
  (Employee with research experience)
- **Gordon D'Rosario**
  (Manager, Student well-being)
- **Dr Sam Duncan**
  (Employee with research experience)
- **Janet Cohen**
  (Employee with research experience)
- **Dr Cristina George**
  (Employee with research experience, from October 2023 OTL member and Secretariat)

**Holmesglen has established the Human Research Ethics Review Panel (HRERP) to review, approve and monitor human research in accordance with the requirements of the National Statement on Ethical Conduct in Human Research (2018) and the Australian Code for the Responsible Conduct of Research (2018).**

The Panel meets five to six times a year to review internal and external applications for research undertaken at Holmesglen. This important role ensures the well-being of all stakeholders involved and safeguards the standards and reputation of the Institute in matters of academic and professional practice related to research. The Panel also provides guidance in relation to the conduct of research and works with prospective researchers on the development of their ethics applications.

Applications reviewed in 2023 included: the limitations of current curtain wall installation methodologies and the edge cases where deviation from the normal procedure is required, the outcomes of mindfulness interventions in students at Holmesglen, evaluation of an innovative medication safety curriculum in a Diploma of Nursing course, a B4.0CRC Lighthouse Project #13 - Mixed Reality Carpentry Demonstration, academic learning support in the adult learning environment for students undertaking VET courses at Holmesglen, data collection for scaffolding instruction and the Impact of Media Use on Team Feedback and Team Performance on Construction Projects.



# The Path Ahead

**Our aspiration is to strengthen our research profile and to consolidate Holmesglen's position as a leader in applied research. To do this we need to challenge further what research is and what it can be, to frame and promote a clear alternative to commonly accepted understandings, and to position ourselves as part of the research 'ecosystem'; an 'ecosystem' that focuses on outcomes-based research and innovation in partnerships and collaborations with other research organisations, industry, government, and community.**

This alternative embraces a fresh way of thinking that allows the utilisation of the full resources a VET institution has to offer. It maintains a coherent approach to applied research that builds upon our successes and demonstrates that we can be accepted as an organisation that undertakes applied research.

To promote change is difficult, yet we must broaden participation to include students, teachers, 'early researchers', policy makers along with industry and community and have them accept that applied research and innovation is an important step in rethinking the idea of research and to embed it into the very fabric of education, training, industry and community.

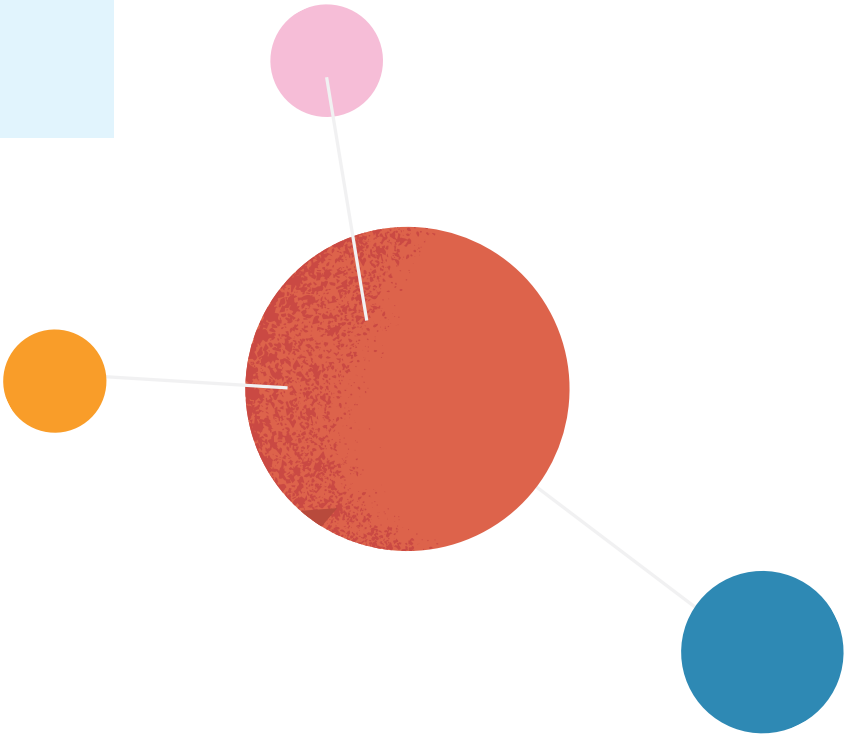
Dr Henry Pook

## Contact us

For business and the community sector we are on hand to examine the potential benefits of partnering with Holmesglen and to evaluate how this would assist in improving the competitiveness, productivity, efficiencies, and/or commercial outcomes of your company or organisation.

If you are keen to know more about Holmesglen research and how it can help your business, education provider or community organisation please contact:

**Dr Henry Pook, Director**
**The Holmesglen Centre for**
**Applied Research and Innovation**
**E: henry.pook@holmesglen.edu.au**
**T: + 61 3 9564 1886**



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**In the spirit of reconciliation, Holmesglen recognises and celebrates the Traditional Owners of the lands throughout Victoria and beyond on which we educate and train. We pay our respects to Elders past and present and acknowledge our emerging leaders.**

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