Wilf Malcolm Institute of Educational Research
Te Pūtahi Rangahau Mātauranga o Wilf Malcolm
THE UNIVERSITY OF WAIKATO

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Te Whare Wānanga o Waikato

Information and Communications Technology Research

Spotlight on Digital Technologies

WMIER specialising in the facilitation of ICT Research for Te Kura Toi Tangata Faculty of Education

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FACULTY OF EDUCATION ICT RESEARCH PROJECTS

Foreword

The 21st century has seen a dramatic rise in the increasing importance and pervasiveness of digital technologies across many spheres of life. This has resulted in greater demands being placed on educators to incorporate digital tools in their practice to support more flexible, personalised and relevant learning opportunities. This is not without challenge, be it at the micro level (individual teachers trying out new technology-supported initiatives in their practice) or the macro level (systems and policies that encourage or moderate digital access within educational institutions). As Jenkins et al. (2006) remind us, digital equality is no longer confined to physical access, it has social and cultural aspects.

This issue of 'Spotlight on Digital Technologies' addresses some of these challenges and showcases what might be possible when educators come together with researchers to rethink and reimagine what constitutes effective digital-based teaching and learning. The metaphor of a spotlight succinctly illustrates the way this research illuminates and creates new spaces for learning, highlighting new ways of communicating and collaborating and blurring the distinction between formal and informal learning opportunities.

Highlighted are examples of projects conducted by Te Kura Toi Tangata Faculty of Education staff in partnership with centres, schools and university colleagues over the last five years. These span initial teacher education, science and mathematics education, and the role of action sports. The projects span early childhood, compulsory schooling and tertiary settings, illustrating the depth and breadth of interest in technology-supported teaching and learning. We invite you to delve into the projects presented and to make contact with any of the research teams to foster ongoing dialogue and development in this field.

Professor Roger Moltzen, Dean Faculty of Education
Professor Bronwen Cowie, Associate Dean Research, Director of WMIER.

Digital Technologies Research in Education

'Bring your own device' (BYOD) in a Secondary School

Why is this research important?

There is a need to examine teachers' use of digital technologies with specific classes, as schools develop their BYOD implementation plans. This is because schools need to understand impacts, infrastructure and professional development needs. The research team is examining teachers' pedagogies as they integrate digital technologies into their classroom practices and the impacts on learners and their learning.

What is the background to the project?

This project is a partnership between WMIER and Hillcrest High School where teachers collaborate to share their experiences of incorporating digital technologies into their classroom practices. This is now the third year of the project, which has grown from three teacher participants to seven. The project involves teachers of mathematics, art, Spanish, French, music, physics and science, providing a cross-section of secondary school subjects.

Project life cycle: 2013-2016
Funded by: Wilf Malcolm Institute of Educational Research (WMIER)
Contact: Dr Noeline Wright n.wright@waikato.ac.nz

What are the key findings to date?

A key finding is that digital technologies do not necessarily 'transform' teachers' pedagogical practices. This is particularly true if teachers are already highly student-centred in their pedagogy. In such cases, the technology affords opportunities that were not there before. For example, immediate access to current information and access to tools that can suit individual needs within a single classroom.

An emerging finding is that when teachers include digital technologies into classroom practices, students concentrate on tasks for much longer than with pen and paper tasks and they produce higher quality learning products.

What are the most important facts to take away so far?

(a) Developing readiness for BYOD is complex and raises a number of issues about IT infrastructure, IT support, device safety and school hardware provision;
(b) Pedagogical practice is enhanced by digital technologies' affordances.

Who is the principal researcher?
Director: Dr Noeline Wright (*right*)

School co-participants: Liaison teacher: Mervyn Cook (Director elearning Hillcrest High school)

Participants: Annabel Rowlands, Bijendra Prasad, Suskia van der Merwe, Ingrid Rinsma, Anita Tyrrell & Sarah Collett.

Key project publication:
Wright, N. (2015). Vignettes of pedagogical practices with iPads: Reinforcing pedagogy, not transforming it. *International Journal of Online Pedagogy and Course Design*, 5(3), 62-73.

Exploring student thinking and problem solving in iPad supported learning environments

Why is this research important?

Mobile digital devices such as iPads are becoming increasingly commonplace in New Zealand schools, supported by initiatives such as 'Bring Your Own Device'. Understanding more about how teachers can structure and design learning tasks and environments that take full advantage of the capabilities these new technologies offer, informed by knowledge of how students work and interact with them and their apps in natural classroom settings, is essential. The primary goal of this research is to investigate the nexus of curriculum design and teacher pedagogy and technology capability, to determine how it can be optimised to support student thinking and learning across the primary school curriculum.

What is the background to the project?

Developed from an informal collaboration, this two year, TLRI-supported project is located in a provincial contributing primary school and involves 100 students and four teachers, working in two innovative learning spaces. To date, display capture, interview and observational data of students engaged in app-based computational thinking activities, and in student-led science inquiries supported by science concept teaching apps, have been analysed for evidence of thinking skill exercise and development.

Project life cycle: 2015-2016
Funded by: Teacher and Learning Research Initiative
Contact: Assoc. Professor Garry Falloon falloong@waikato.ac.nz

What are the key findings to date?

Engaging even very young students in computational tasks such as basic coding can provide teachers with an excellent opportunity for their students to exercise and build a range of higher order thinking capabilities. These include analysis, evaluation, reflection and predictive thinking. When embedded in curriculum and pedagogical designs reflecting problem-based approaches and emphasising learner collaboration, they can also serve as a useful means of helping students develop key competencies such as thinking, participation, using symbols and relating to others. Well-designed and carefully selected apps can be valuable scaffolds for students' science learning, especially when sufficient capability exists to enable students to make their own decisions and choices on which, how and when apps are used, to support different aspects of science inquiries.

What are the most important facts to take away so far?

(a) Computational activities such as coding provide valuable opportunities for students to exercise a range of thinking types, but these require careful and systematic planning and implementation to ensure young students in particular, grasp foundational concepts;

(b) Working collaboratively on computational activities in pairs or small groups can be a useful means for students to develop an array of key competencies;

(c) Over time, students increasingly view personal digital devices such as iPads as a natural tool for their learning, and are able to make excellent decisions about how to use them, and their apps, to best support their learning.

Who is the principal researcher?
Associate Professor Garry Falloon (*right*)

Key project publication:
Falloon, G.W. (2016). iPads, apps and student thinking skill development, *SET 2016, No 1*.

Enhancing boys' writing through transformational elearning pedagogy

Why is this research important?

Boys tend to underperform compared to girls in literacy across New Zealand schools (Watson, Kehler, & Martino, 2010). This gender disparity, especially in boys' writing, widens as boys progress through the primary school years (National Education Monitoring Report (NEMP) 2010; National Monitoring Study of Student Achievement: English writing (NMSSA), 2012). E-learning and ICT tools can offer these struggling writers access to a wider and more authentic audience, encourage student voice and allow more timely and responsive feedback. They also offer new possibilities for teacher and peer feedback. The aim therefore, of the project is to explore struggling boys' writing skills and how they can be developed through feedback using e-learning tools in a primary school context.

What is the background to the project?

The school wants to enhance the writing of boys who are struggling with their writing. Therefore the teachers are embarking on cycles of inquiry to explore and trial a range of ICTs with the goal of creating more authentic contexts and audiences for boys' writing. Peers and/or more senior students are involved in multiple feedback conversations and revisions of students' writing before students present their work to a wider audience.

Project life cycle: June 2015-December 2016
Funded by: Teacher Led Innovation Fund
Contact: Dr Elaine Khoo ekhoo@waikato.ac.nz

What are the key findings to date?

When scaffolded through teacher modelling, young students can provide helpful feedback on peers' writing. Google docs can allow teachers to engage with students in feedback as dialogue.

What are the most important facts to take away so far?

The project involves the whole staff from years one to eight, and endorses the value of teachers sharing and discussing student writing and how it might be enhanced. Whole school teacher collaboration and the use of ICTs can transform student writing experiences in ways that motivate them, engage a wider community to give feedback on student writing and develop a deeper understanding of student thinking and writing.

Who is the principal researcher?
Dr Elaine Khoo *(right)*

Research Team:
Professor Bronwen Cowie
Dr Stephanie Dix

Lead teacher-researcher: Debra White
All teachers at St Peters Catholic School, Cambridge.

Re-engineering an engineering course: How flipped classrooms afford transformative teaching, learning, and workplace competency

Why is this research important?

Engineers have a key role to play in translating knowledge into the innovative competitive products. Hence, engineers need opportunities to develop analytical skills, creativity and communication skills. Engineering educators need to help their students to develop and master threshold concepts (TC) and competencies that encompass both technical and non-technical skills needed in a workplace. This project explores the effects of the flipped class (lecture materials/videos are assigned as take-home tasks and class time is devoted to problem solving) on students' learning of threshold concepts and competencies in a first-year compulsory electronics engineering course.

What is the background to the project?
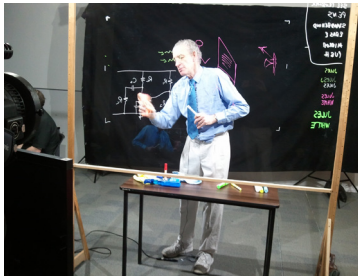
Through our previous work we have found that TC theory is an effective theoretical framework for supporting lecturers to re-envision teaching and learning. It provides opportunities to raise questions about what the important ideas are within a discipline and what it means to be an expert in the field. The flipped class project has been developed to reinforce and extend our work on TCs as a way to grow practical, TC-founded, workplace competencies for engineering graduates.

Project life cycle: January 2015-March 2017
Funded by: Teaching and Learning Research Initiative
Contact: Dr Mira Peter mpeter@waikato.ac.nz

What are the key findings to date?

Students enjoyed learning from the videos and the flexibility that the videos afforded for review purposes. When students did watch the videos in a timely manner they found them to be useful to their learning. They particularly liked the conversational style of the video presentation. However, key issues were a lack of motivation to watch the videos prior to practical lab sessions, preference for learning from a 'real' person instead of videos, and time management and learning skills challenges in coping with being responsible for their own learning in the first semester of university coursework.

What are the most important facts to take away so far?

(a) The flipped classroom approach offers benefits and flexibility for students' learning of threshold concepts;
(b) Students need support to learn efficiently and effectively in the flipped classroom;
(c) A coherent and integrated course design with the appropriate use of online and face-to-face resources is crucial.

Who are the principal researchers?
Dr Mira Peter (*right*) & Dr Elaine Khoo

Practioner Researchers:
Professor Jonathan Scott
Assoc. Professor William Howell Round
Project Mentor: Professor Bronwen Cowie

Summer Scholar: Craig Gilliver 2014-2015

Key project publication:
Khoo, E., Peter, M., & Cowie, B. (2015). Re-engineering an engineering course: How flipped classrooms afford transformative teaching, learning, and workplace competency. *Journal of Research in STEM Education, 1*(1), 71-76.

Enhancing teaching and learning of primary mathematics through the use of apps

Why is this research important?

Today's primary school learners appear to be engaged by mobile technology. Even so, just allowing learners access to mobile technology in the classroom situation is not sufficient, and research is needed to examine how apps can be used effectively to enhance understanding in mathematics. There is evidence that digital technology has a positive impact on learning behaviour, motivation and engagement. Through co-inquiry based on a researcher-practitioner partnership in two primary schools, this project is co-constructing a framework to evaluate and inform teacher pedagogical decisions regarding the use of apps to enhance students' conceptual understanding in mathematics.

What is the background to the project?

The aim of the project is to support teachers in improving the teaching and learning of mathematics. The primary focus of the project is on teaching and learning primary mathematics through the use of apps with mobile digital devices. Specifically, the project aims to use the lens of teachers' technology, pedagogy, and content knowledge (TPACK) to advance and investigate the use of apps in primary mathematics classrooms, and their influence on students' mathematical learning.

What are the key findings to date?

A key finding is that while the mobile technologies offer particular affordances, such as haptic and aural-visio recording of student thinking, that shape the mathematics learning in distinctive ways, it appears that an assemblage of technological and social elements are required to best enhance the mathematics engagement, learning and mathematical thinking.

What are the most important facts to take away so far?

We have identified several key themes regarding the relationship between technology and pedagogy: affordances, engagement, mathematical thinking, personalised and differentiated learning and collaborative learning. While the affordances of mobile technologies allow the mathematics learning to be reshaped and engaged with in alternative ways, it seems that it is the pedagogy of the teacher that is central for enhanced learning to take place.

Who are the principal researchers?
Dr Nigel Calder (*far right*)
Dr Carol Murphy (*right*)

Teacher Researchers:
Glen Storey
Monique Storey
Rebekah Whyte

Research Assistant: Helen Willacy
Summer Scholar: Amie West

Key project publications:
Presentations at academic and teacher symposia.
Paper accepted for ICME 2016 conference presentation and proceedings.
Paper accepted for DEANZ 2016 conference presentation and proceedings.

Copy, cut and paste: How does this shape what we know?

Why was this research important?

Copy, cut and paste are functions naturalised and embedded across different software but are poorly understood as tools that shape our engagement with knowledge, culture and society in the 21st century. There was emerging evidence that this digital generation may not be aware of how to apply software embedded technologies effectively to enhance their learning. As such there existed a need to investigate how students acquire knowledge and skills to use software, and the extent they are able to apply and extend this knowledge and skills to successfully learn and act in formal tertiary learning contexts.

What was the background to the project?
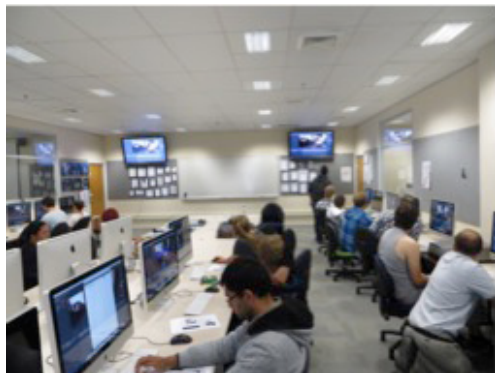
This two year research project investigated the notion of 'software literacy', the expertise involved in selecting, using and critiquing the software when this is used to achieve particular goals. The project considered how it developed and impacted on tertiary teaching, learning and student experience of knowledge generation, communication, critique and use in engineering and media studies. Case studies were developed to focus on PowerPoint and on the discipline-specific software .

Project life cycle: Completed March 2015
Funded by: Teaching and Learning Research Initiative
Contact: Dr Elaine Khoo ekhoo@waikato.ac.nz

What were the key findings to date?

Students adopt informal learning strategies to support their software learning. They were familiar with PowerPoint and confident in troubleshooting their disciplinary software. However, very few discussed how software shaped their disciplinary knowledge (a key part of software literacy). Students' software literacy occurred at various rates and shaped by lecturer teaching approaches, student expectations, and disciplinary assumptions about the need to achieve professional levels of software competency.

What were the most important facts to take away?

Software is not neutral. A software's affordances and constraints need to be considered. Lecturers need to be aware of the implications of their choice and use of software and to discuss these and help students to develop critical awareness of how specific software can impact on their learning.

Who was the principal researcher?
Dr Elaine Khoo (*right*)

Researchers:
Dr Craig Hight
Dr Rob Torrens
Project Mentor: Professor Bronwen Cowie

Key project publications:
Khoo, E. Hight, C., Torrens, R., & Ranger, G. (2015). Tracing software learning and application from formal into informal workplace learning of CAD software. In A. Oo, A. Patel, T. Hilditch & S. Chandran (Eds.), *The Proceedings of the 26th Annual Conference of the Australasian Association for Engineering Education* (AAEE2015) (pp. 515-524). Victoria, Australia.

Khoo, E., Hight, C., Cowie,B., Torrens. R., & Ferrarelli, L. (2014). Software literacy and student learning in the tertiary environment: PowerPoint and beyond. *Journal of Open, Flexible and Distance Learning, 18*(1), 30–45.

Young children using iPads

Why was this research important?

Tablet technologies such as the Apple iPad have garnered interest and increasingly been adopted as a learning tool and a resource to engage children's learning. Despite a growing literature on educators' use of iPads in their teaching across the compulsory schooling and tertiary sectors, there has been a scarcity of studies in the early childhood education (ECE) context. This exploratory qualitative research project aimed to inform the current debate on young children's iPad use. It recognised that young children were increasingly exposed to (and to an extent expected to make use of) digital and mobile technologies as members of a digital generation.

What was the background to the project?

The researchers collaborated with two early childhood educators to gather the perspectives of teachers, young children and their parents about how they used iPads for educational purposes. We interviewed the teachers, observed teacher-children interactions, collected children's iPad supported work and case studied four children and their families to identify factors that shaped their iPad interest.

What were the key findings to date?

Although young children easily develop skills for using the iPad, it was their interactions with the teacher and peers that were most valuable to their productive iPad use. The iPad supported peer learning and collaborative exploration, included learning opportunities that fostered children's emerging literacies, social relationships and sense of belonging at the ECE centre.

What were the most important facts to take away?

Teacher understanding of the opportunities iPads offer and then their deliberate incorporation of these opportunities, can support young children's learning. The quality of teacher-child interaction is central to children becoming aware of, and developing the skills, confidence and dispositions for meaningful and productive engagement with iPads as learning tools.

Who was the principal researcher?
Dr Elaine Khoo *(right)*
Researcher: Rosina Merry
Project Mentors: Professor Bronwen Cowie
Professor Margaret Carr

Key project publications:
Khoo, E., Merry, R., & Bennett, T. (2015). "I want to say…": Privileging young children's voice in iPad-supported assessment for learning. *Early Childhood Folio, 19*(1), 3-9. doi: http://dx.doi .org/10.18296/ecf.0002

Khoo, E., Merry, R., Bennett, T., & MacMillan, N. (2015). "It's about the relationships that we build": iPad supported relational pedagogy (Ngā Hononga) with young children. In N. Wright & D. Forbes (Eds.), *Digital Smarts: Enhancing learning and teaching (pp. 8-26)*. Hamilton, New Zealand: Wilf Malcolm Institute of Educational Research.

Khoo, E., Merry, R., & Nguyen, N.H., Bennett, T., & MacMillan, N. (2015). iPads and opportunities for teaching and learning for young children, *iPads n kids*. Wilf Malcolm Institute of Educational Research, Hamilton, New Zealand.

Ideals and reality:
The use of digital tools in teacher education

Why is this research important?

It is a common assumption that teacher education has to reflect what is going on in the field of practice. Therefore, digital literacy needs to be clearly highlighted in teacher education. Despite intentions regarding the use of technology in education, research shows that there is a gap between policy intentions and what is actually practiced in higher education in Norway. This research is about understanding this gap as being more than practitioner deficiencies. In connection to this, (Krumsvik, 2014) raises the important question: *Is the eagerness for more technology in education based on solid research findings, or is this enthusiasm based on political eagerness for innovation in education?*

What is the background to the project?

This project is an international comparative study of tertiary academics' use of digital technology in their teaching at UIT The Arctic University of Norway and at the University of Waikato. Both universities have a focus on the developing profession-based digital literacy. The academic year 2014/2015 was defined as "The Digital Year" at the Department of Education and Pedagogy at UIT. The project "Digital literacy @ Waikato" focuses on supporting continuous improvement in lecturer practice. Staff from both Faculties have completed a survey of how they experience the implementation of digital tools in education. Ten staff from each site will be asked to participate in in-depth interviews as a further aspect of this research.

What are the key findings to date?

The findings from the Norwegian part of the study indicate a double culture within the educational context in attitudes towards digital tools, indicating the majority do not consider them to be essential to good teaching. Conversely, a great majority reported using digital tools often in their own teaching. These findings suggest that teacher educators' attitudes towards digital tools are conflicted and not consistent within the individual. The comparative data from New Zealand indicates that the Norwegian situation could be related to policy development and political governing of education, where possible underlying political motives need to be addressed.

What are the most important facts to take away so far?

The research indicates that the governing of education by top down policy resulted in incoherent attitudes towards the use of digital tools in education. The research found that gaps between policy and reality can result in internal conflict for teacher educators. Giroux's statement regarding pedagogy is relevant here: "*To invoke the importance of pedagogy is to raise questions not simply about how students learn but also about how educators [...] construct the ideological and political positions from which they speak*".

Who is the principal researcher?
Siri Sollied Madsen (right*)*

Research Adviser:
Dr Carol Hamilton *(far right)*

Key references and publications:
Giroux, Henry A. 1990. Rethinking the
Boundaries of Educational Discourse: Modernism, Postmodernism, and Feminism. *College Literature 17* (2/3),1-50.
Krumsvik, R. (2014). Teacher educators' digital competence. *Scandinavian Journal of Educational Research, 58*(3), 269-280.
OECD. (2012). Connected Minds. Technology and Today's Learners. *Educational Research and Innovation*: OECD Publishing.

Science and Biotechnology Learning Hubs

SCIENCE LEARNING HUB
sciencelearn.org.nz

Why is this research important?

"It's like having an expert in your classroom!"

The Science Learning Hub (sciencelearn.org.nz) and Biotechnology Learning Hub (biotechlearn.org.nz) use multimedia resources to showcase New Zealand science research and development, and link these to classroom resources, making current research accessible to a school audience. With over a decade of funding, the Learning Hubs programme represents a significant Government investment in science education in New Zealand, as well as an enormous contribution from scientists and science organisations.

What is the background to the project?

This project is part of the Government's National Strategic Plan for Science in Society by contributing to:

(a) Greater teacher confidence in teaching science;
(b) Teachers having improved access to the resources they need to teach science subjects;
(c) A greater proportion of New Zealanders, across all sectors of society, engage with, and value science and technology.

Project life cycle: 2003-ongoing
Funded by: Ministry of Business, Innovation and Employment
Contact: Dr Cathy Buntting buntting@waikato.ac.nz

What are the key findings to date?

The research programme included annual surveys, classroom-based research, and analysis of Google Analytics data. Key findings are:

(a) Teachers most value the New Zealand examples and teaching ideas;
(b) Many teachers believe using the Hubs contributes to their students' understanding of science and what scientists do, and that students became more positive about science;
(c) Professional development is associated with greater uptake of a wider range of the Hub resources;
(d) Teachers are able to adapt the resources to suit particular classes and learning needs.

What are the most important facts to take away so far?

Professional support is important for enhancing the ways the digital resources are used. The strength of the Learning Hubs programme is not only the quality of the resources, but also the network of communication and support provided by the programme, currently through online PD sessions, newsletters, an extensive social media programme and rapid responses to the enquiries email.

Who are the principal researchers & directors?
Dr Cathy Buntting (*right*)
Professor Bronwen Cowie
Professor Alister Jones

University of Waikato Team:
Andrea Soanes (Project manager)
Barbara Ryan (Professional development facilitator)
Angela Schipper (Content developer)
Dr Mira Peter (Analysis)

Networked science inquiry: An investigation in junior secondary science classrooms

Why was this research important?

This project explored and theorised how inquiry teaching and learning in junior secondary science could be supported through e-networked environments such as blogs or e-mail and how online resources accessed through the Internet can afford individual and group exploration of content, skills and resources. The aim was to understand how these tools could make science education more relevant and responsive to the needs and interests of students from diverse backgrounds.

What was the background to the project?

The project built on an earlier TLRI project into the use of digital tools. Multiple data sources were collected before, during and after the teaching of a science unit. The project developed case studies of the six teachers and their classes, to develop rich descriptions of how the process of networked inquiry in science evolves and can be stimulated. These cases were subject to cross-case analysis to search for themes.

What were the key findings?

(a) E-networked tools can support each of the different aspects of the science inquiry cycle/process;

(b) E-networked tools support students to: (i) exercise agency, (ii) access

and share their own and others' input, and (iii) access a wide range of sources of information and resources for meaning making;

(c) Teacher enactment of science inquiry with e-networked tools is both enabled and constrained by technological, institutional and pedagogical factors.

What were the most important facts to take away?

(a) Explicit teacher planning for e-networked based science inquiry learning is needed to initiate the inquiry process;

(b) By taking small forays into parts of, or implementing a focused inquiry cycle and progressively building on student experiences, teachers and their students can develop a better understanding of, and capacity to conduct inquiries using e-networked tools;

(c) School management needs to support teachers (and students) in e-networked inquiry practices by investing in robust networking platforms, adopting policies that encourage productive e-networked tool use, recognising teacher efforts in e-networked inquiry learning practices and allowing some flexibility and responsiveness in curriculum and assessment.

Who are the Project Directors and Researchers?

Dr Kathrin Otrel-Cass
Professor John WIlliams
Research Team: Dr Elaine Khoo
Professor Bronwen Cowie (*right*)
Dr Kathy Saunders together with six high school teachers and their students.

Key project publications:

Otrel-Cass, K., Khoo, E, & Cowie, B. (2014). Networked environments that create hybrid spaces for learning Science. *E-Learning and Digital Media, 11*(1), 88-104.

Williams, J., Cowie, C., Khoo, E., Saunders, K., Taylor, S., & Otrel-Cass, K. (2013). *Networked inquiry learning in secondary science classrooms. Summary report*. Wellington, New Zealand: Teaching and Learning Research Initiative.

e-in-science

Why was this research important?

This project was one of three strands in a larger project commissioned by the Ministry of Education to find more effective ways of supporting schools to implement their science curriculum within the framework of The New Zealand Curriculum. The research was carried out by NZCER in collaboration with the University of Waikato and Learning Media.

What was the background to the project?

The purpose of the e-in-science strand was to identify and explore innovative ways for e-in-science to enhance teacher capability and increase student engagement and achievement in science. This included investigating how e-learning might be harnessed to help create a future-oriented science education programme.

What were the key findings?

A key outcome from this project was the production of *Digital technologies and future-oriented science education: A discussion document for schools: education programme.* Teachers and schools are invited to consider the science learning that students will need to participate effectively in a knowledge society, whether or not they pursue a science-related career. Future-focused science education is also identified as involving students in programme design, and students engaging

Project life cycle: Completed 2013
Funded by: The Ministry of Education
Contact: Dr Cathy Buntting buntting@waikato.ac.nz

with contemporary science practice. Both of these could be supported by digital technologies.

What were the most important facts to take away?

In science education (and other learning areas), innovation and transformation could be associated with:
(a) Ubiquitous access to resources;
(b) Ubiquitous connections into the local and global community;
(c) An 'open' curriculum;
(d) Leapfrogging learners into complex knowledge.

Linked strategies that are needed to support innovation include vision, support for the innovation, improved capability, and enabling tools and infrastructure. While teaching is a complex task that requires commitment, courage, tenacity and large amounts of energy, one of the rewards is knowing that students are better equipped for making thoughtful, informed decisions because of time they have spent in your classroom.

Who is the University of Waikato Project Director?
Dr Cathy Buntting (*right*)

University of Waikato Expert Group:
Professor Bronwen Cowie, Assoc. Professor Garry Falloon, Dr Mike Forret, Dr Elaine Khoo, Dr Noeline Wright

Key project publications:
e-in-science. (n.d.) *Scoping the possibilities*. Retrieved from http://www.nzcer.org.nz/research/publications/e-science-scoping-possibilities
e-in-science. (n.d.) *Developing innovation*. Retrieved from http://www.nzcer.org.nz/research/publications/e-science-developing-innovation
Digital technologies and future-oriented science education. (n.d.) *A discussion document for schools. Retrieved from* http://scienceonline.tki.org.nz/Science-capabilities-for-citizenship/Science-capabilities-resources

Digital Technologies across Disciplines

Using social media to build professional online presence and effective learning networks across disciplines

Why is this research important?

There is a need to know how to assist tertiary students to establish an online reputation that is compatible with, and supportive of, professional identity. There is also a need to understand how students might develop a network for connected professional learning where mentoring can take place. It is important to illustrate how professional online presence and learning networks can grow and be carried forward as graduates enter the workforce and sustain lifelong learning.

What is the background to the project?

This project is developing a series of case studies to determine how lecturers at the University of Waikato actively promote the use of social media to prepare students for future professional expectations and lifelong learning. The project investigates ways to encourage tertiary students to establish and maintain a professional online presence prior to graduation and during the first years of employment in their chosen profession. Learning networks are an opportunity to join and sustain a community of professionals, to engage in adaptive help seeking and to adopt a proactive stance in relation to professional and lifelong learning.

What are the key findings to date?

Across the University of Waikato, academic staff are blogging for and with students in science and teacher education. They are using Pinterest in the study of sustainable management and using FaceBook, Instagram and Twitter in a range of contexts to support university study and to maintain contact with alumni who have joined a variety of professions. While there are pockets of excellence and innovation in the use of social media for tertiary teaching and learning, it is by no means a widely established practice for tertiary students to cultivate a professional online presence and learning network as an integral part of their studies.

What are the most important facts to take away so far?

The project promotes effective use of social media for tertiary teaching and learning, ensuring the online profile of staff and students will enable rather than hinder future professional goals through guidelines for practice. It is anticipated that learning how to establish and maintain an online learning network will be of use to students after graduation as they join their chosen profession and pursue further professional learning.

Who are the principal researchers?
Dr Dianne Forbes *(right)*
Assoc. Professor Eva Collins

Key project publication:
Forbes, D. (2015). Building connections: Professional online presence and learning networks. Presented at ECSM 2105 2nd European Conference on Social Media, Porto, Portugal, 9-10 July 2015. http://academic-conferences.org

Transnational mobilities in action sport cultures

Why is this research important?

Trends in contemporary action sport cultures raise important questions about the changing nature of sport in the 21st century. Adopting a global ethnographic approach and engaging multiple theoretical perspectives, this project culminating in the book, ' *Transnational Migration and Mobilities in Action Sport Culture'*, examines how transnational action sport corporations, mega events and media spectacles, the international travel patterns of athletes, tourists and migrants, and the high use of social media among participants, are contributing to the emergence of a transnational imaginary within and across action sport communities.

What is the background to the project?

Action sport participants are prolific users of digital and social media that 'blur the boundaries between physical and imaginative mobility' *(Jansson, 2007, p. 6)*. The importance of social media is highlighted in '*Digital Media and the Transnational Imaginary: Virtual Memorialization of Global Action Sport Stars' (Chapter 3),* which discusses how sporting communities

are evolving in the age of web 2.0, and the role of the internet in the cultural/digital memorialization of fallen sporting heroes. In '*The Emergence of Action Sports in the Middle East: Imagining New Mobilities with Parkour in Gaza' (Chapter 8)*, there is a discussion on the role of social and digital media for the growth (and cultural reappropriation) of action sports in the Middle East, as well as how young men who practice parkour in Gaza are using social media for political purposes.

What are the key findings to date?

Associate Professor Thorpe is continuing to explore the importance of social media in the lives of youth in a Marsden-funded project on action sports in sites of war, conflict and disaster. She is developing digital ethnographic methods using Facebook, Instagram and Twitter and exploring the ethical implications of such methods, as well as software and programmes to facilitate more systematic and rigorous digital research methods.

Who is the principal researcher?
Assoc. Professor Holly Thorpe

Key reference and project publications:
Jansson, A. (2007). A sense of tourism: New media and the dialectic of encapsulation/decapsulation. *Tourist Studies, 7*(1), 5-24.

Thorpe, H. (2014). *Transnational Migration and Mobilities in Action Sport Cultures*. UK. Palgrave Macmillan.

Thorpe, H (2015). Death, mourning and cultural memory on the Internet: The virtual memorialization of fallen sports heroes. In G. Osmond & M Phillips (Eds), *Sports History in the DIgital Era* (pp. 180-200). Urbana: University of Illinois Press.

Thorpe, H. (2013). The internet and the future of sports history: A brief commentary. *Journal of Sport History, 40*(1), 127-135.

Action sports and the Olympics

Why is this research important?

The International Olympic Committee (IOC) has recognised the need to understand and respond to changing youth sport participation and consumption trends. This project is the first to focus specifically on youth attitudes towards the Olympic Games and particularly action sport participants (i.e., skateboarding, surfing, climbing, parkour).

What is the background to the project?

This project is awarded an Advanced Olympic Research Programme grant to understand youth attitudes towards the Olympic Games with a focus on action sport participants. The project involves three methods, two of which use digital technologies extensively:
(1) An online survey that can be completed in nine different languages;
(2) Media analysis of various print and online mass and niche media sources (including social media);
(3) Interviews with key stakeholders in the action sport cultures and industries.

Digital and social media are very important for the first two methods with 850 surveys completed by action sport enthusiasts from all over the world and over 1000 media and social media articles relating to the topic currently being analysed. We are also using skype to conduct most of our interviews with key individuals in the international action sport industries.

Project Lifecycle: July 2014-2016
Funded by: International Olympic Committee
Contact: Holly Thorpe hthorpe@waikato.ac.nz

Assoc. Professor Holly Thorpe (left) being interviewed about the project by Radio New Zealand

What are the key findings to date?

Our data and research will be presented to the International Olympic Committee in Lausanne, Switzerland in early 2016, with the final report due to the IOC in June 2016. The use of digital methods enabled us to develop an indepth understanding of global youth perception of the Olympics and conduct cost effective international research. We continue to reflect on the politics and potential of these methods for understanding contemporary youth sport participation and consumption patterns.

Who are the principal researchers?
Assoc. Professor Holly Thorpe *(right)*
Assoc. Professor Belinda Wheaton *(far right)*

Key project publication:
Thorpe, H., & Wheaton, B. (2011) Why the Olympics are in search of the x factor? *The Conversation:* Retrieved from http://theconversation.com/why-are-the-olympics-in-search-of-the-x-factor-48565

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