Research-led Teaching Project: Discussion Paper

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Executive Summary

Enhancing the student experience at The University of Western Australia (UWA) is one of the University’s key priorities. The UWA 2020: Strategic Plan 2014–2020 acknowledges that the University “aspires to be recognised as a global leader in university education,” and that the introduction of the New Courses in 2012 was designed to “engage, challenge and transform students throughout their courses” (2013b).

The introduction of the New Courses exemplified UWA’s increased focus on the relationship between research and learning, which was heralded by the 2007 paper, Courses for Tomorrow’s World: An Issues and Options Paper on the Structure of Academic Programs at The University of Western Australia. The report noted that research undertaken by students could take “many forms,” including exposure to the latest research, the learning of research skills, and the undertaking of a research project.

The Research-led Teaching Project is a continuation of this increased focus on research-informed education. The project is one of four within the Enhanced Education Strategy, and is chaired by the Vice-Chancellor and the Postgraduate Students’ Association President. The purpose of this paper is twofold: first, to explore the nature of research-led teaching worldwide and within the UWA context and, second, to offer recommendations on how to enhance research-led teaching at UWA.

The paper is structured into four main sections. The first section explores the relationship between research and teaching in universities worldwide. The second section provides an overview of research-led teaching within the current UWA context. The third section proposes a framework for research-led teaching at UWA. The fourth and final section makes 13 recommendations on how to build on the current strengths and enhance research-led teaching at UWA. The paper includes four appendices providing detailed information on international (Appendix A) and national (Appendix B) examples of research-led teaching, findings from consultation at UWA on research-led teaching currently embedded into courses (Appendix C), and a complete list of submissions on research-led teaching provided during consultation for this project (Appendix D).

The paper’s proposed framework for research-led teaching at UWA consists of five interrelated pillars: 1. Engaging students with UWA research and researchers; 2. Teaching of research skills; 3. Students undertaking inquiry learning; 4. Staff scholarship in higher education research; and, 5. Utilisation of evidence-based pedagogy.

The 13 recommendations accompanying the pillars are as follows:

Recommendation 1: UWA audits and promotes current opportunities for coursework students in all units to engage with its researchers.

Recommendation 2: UWA audits and promotes opportunities for students in all units to learn about the cutting-edge research being conducted at the University.

Recommendation 3: Course and major coordinators audit and enhance the teaching of research skills in all undergraduate majors and postgraduate coursework courses to ensure a connected sequence of learning activities that empowers students to apply research skills including critical thinking.

Recommendation 4: UWA explores means to engage the broad student population in research through benchmarking practice globally; through exploration of innovations regionally e.g., the Australasian Council of Undergraduate Research (ACUR); through
encouraging student conferences and publications; and through global partnerships with world-leading research-intensive universities.

Recommendation 5: Faculties increase the number of students participating in Honours annually, with a progressive improvement from the current base of 10–13%.

Recommendation 6: UWA implements electronic badging of units to incentivise and highlight research-led teaching in undergraduate majors and postgraduate coursework courses.

Recommendation 7: UWA encourages and supports staff to actively participate in higher education scholarly societies, for example, by making available HERDSA communications, promoting HERDSA conferences and other meetings, and offering to pay registration for presenters at the WA and national HERDSA forums and conferences.

Recommendation 8: UWA enhances reward and recognition of the scholarship of teaching by giving points in Socrates Teaching and Learning for active membership and participation in scholarly societies that promote and support evidence-based pedagogy.

Recommendation 9: UWA consider the HEA Fellowship Scheme for the ways in which it recognises staff in relation to research-informed teaching.

Recommendation 10: UWA reviews SURF and SPOT surveys with a focus on evidence-based pedagogical strategies.

Recommendation 11: UWA incentivises the utilisation of evidence-based pedagogy through Socrates Teaching and Learning.

Recommendation 12: UWA incentivises and supports the utilisation of evidence-based pedagogy through grants and awards.

Recommendation 13: UWA provides professional development that supports the use of evidence-based pedagogy.
Research-led Teaching Project: Discussion Paper

Enhancing the student experience and the quality of teaching are key priorities for the University of Western Australia (UWA). An important strategy to deliver the University’s aspiration for an outstanding student experience is to draw on its strengths as a research-intensive university by integrating research with its educational activities. The Research-led Teaching Project is one of four projects within the Enhanced Education Strategy and is chaired by the Vice-Chancellor and the Postgraduate Students’ Association President. The purpose of this paper is twofold: first, to explore the nature of research-led teaching worldwide and within the UWA context and, second, to offer recommendations on how to enhance research-led teaching at UWA.

The paper is structured into four main sections. The first section explores the relationship between research and teaching in universities worldwide. The second section provides an overview of research-led teaching within the current UWA context. The third section proposes a framework for research-led teaching at UWA. The fourth and final section makes 13 recommendations on how to build on the current strengths and enhance research-led teaching at UWA. The paper includes four appendices providing detailed information on international (Appendix A) and national (Appendix B) examples of research-led teaching, findings from consultation at UWA on research-led teaching currently embedded into courses (Appendix C), and a complete list of submissions on research-led teaching provided during consultation for this project (Appendix D).

The Relationship between Research and Teaching in Universities

The relationship between research and teaching in universities has been subject to considerable debate, with studies often resulting in ambiguous and sometimes contradictory results (Elken and Wollscheid 2016). These ambiguities and contradictions are likely because studies are highly dependent on how the terms and relationships between research, learning, and teaching are defined and explored (Healey 2005, Ozay 2012). Moreover, as Angela Brew (1999) notes, the relationships between teaching and research are dynamic and context driven. The authors of a recent literature review conclude that studies about the research-teaching nexus which draw on a broad concept of research tend to find a positive or synergistic relationship with teaching (Elken and Wollscheid 2016).

The Boyer Commission’s Report (1998) resulted in undergraduate student research becoming an imperative and a point of difference for research-intensive universities in the US. The report recommended that research-based learning should be standard in research-intensive universities and that learning should be inquiry based from the freshman year. Since the Boyer report, studies have shown a correlation between undergraduate research and increased participation in postgraduate research (Willison and O'Regan 2007). Indeed, one study suggested that PhD completion rates were doubled for students who had participated in undergraduate research (Bauer and Bennett 2003). While also moving towards the integration of student research in coursework, Australia differs somewhat from developments elsewhere due to the continued emphasis on the Honours year as marking both the “capstone” moment in undergraduate study and the transition to higher degree-based research (Cuthbert, Arunachalam, and Licina 2012, Kiley, Moyes, and Clayton 2009).

There are some notable differences between student research conducted in Australia and elsewhere. Students at universities in the UK and North America normally complete a dissertation in their final year of undergraduate study. In addition, many of the leading universities in the UK and North America run a formal and competitive program for students known as the Undergraduate Research Opportunity Program (UROP), also known as the Undergraduate Research Experience Program (UREP). The programs offer either credit or
stipends/salaries for selected students to conduct short-term research activities. These undergraduate research opportunities are overseen by a mentor, often within existing research teams.

In North America, the undergraduate research featured on university websites is usually part of a UROP (or UREP). The case studies presented in Appendix A provide a number of examples. While there are variations in the form and scale of the US programs, they often share features. For example, undergraduate research programs in the US are commonly conducted in research-elite universities or small private liberal arts colleges with high fees and small class sizes. They are often supported by endowments or competitive grants from national organisations such as the National Science Foundation (NSF) (Healey and Jenkins 2009). Undergraduate research programs tend to be coordinated by a central undergraduate research office; are offered to high-achieving students; are often conducted outside the formal semesters or terms, e.g., summer enrichment programs; include one-on-one academic staff-student mentoring; and may result in student publications or dissemination of research, e.g., in undergraduate research journals or at conferences.

While research-led teaching (and similar terminology) is more likely to be used in the UK than in Canada and the US, several North American universities propose inspiring definitions of research on their undergraduate webpages. For instance, the University of British Columbia describes research as “any pursuit undertaken to enrich our understanding of the world. Since research takes place in all academic disciplines, it comes in many different forms.” Johns Hopkins University couches research within the language of discovery through a partnerships model. Students are thus “investigators”: “Every day, our faculty and students work side by side in a tireless pursuit of discovery, continuing our founding mission to bring knowledge to the world. Whether you study engineering, chemistry, music, anthropology, or all of the above, every student here – no matter his or her major – is an investigator.” At the University of Chicago, the term “undergraduate research” encompasses research, scholarship, and creative endeavours, recognising that examples may range from historical scholarship, art exhibitions, and laboratory experiences to music composition, data analysis, and creative writing.

The Current UWA Context and Research-led Teaching

UWA is a member of the Group of Eight (Go8), comprising the leading eight research universities in Australia. The University’s policies and strategies on teaching demonstrate a commitment to teaching and learning, and to the connection between teaching, learning, and research. The University’s UWA 2020: Strategic Plan 2014–2020 articulates a vision that includes the following as one of six defining characteristics: “Research-intensive, with a strong teaching and research nexus across all our disciplines” (2013b). The Strategic Plan states that the University “aspires to be recognised as a global leader in university education,” with the introduction of the New Courses in 2012 designed to “engage, challenge and transform students throughout their courses” (2013b). In addition, the Strategic Plan draws attention to the University’s aspiration of delivering “an outstanding holistic student experience … and achieving high levels of student satisfaction.”

Evidence from around the world shows a positive correlation in student surveys where students are exposed to leading researchers and can verify the claims by the University of a research-informed student experience. By contrast, where that experience is mediated by predominant exposure to casual staff and to PhD candidates, the correlations are less positive in student surveys. Quality agencies also take an interest in how universities substantiate their claims of a research-rich student experience.
UWA Education Principles

The UWA Education Principles state that, in order to “nurture excellence, enable creativity and intellectual exploration, and promote effective citizenship among its students and graduates,” the University will promote the following actions among its students:

To develop disciplinary and interdisciplinary knowledge and skills through study and research-based enquiry, at internationally recognised levels of excellence:

- to think, reason and analyse logically and creatively
- to question accepted wisdom and be open to innovation
- to acquire the skills needed to embrace rapidly changing technologies.

To further develop the skills required to learn, and to continue through life to learn, from a variety of sources and experiences:

- to develop attitudes which value learning
- to acquire skills in information literacy.

These actions clearly refer to research activities that develop higher order thinking skills and lifelong learning, respectively.

UWA Education Futures Vision Statement

The strategic plan refers to the document *Education Futures: Our Vision* (2013a), which presents seven statements emphasising the importance of evidence-based teaching. This document states that “Learning and teaching experiences at UWA are integrated with, and informed by, research,” “Teachers at UWA are well qualified and experienced researchers and scholars … [who] bring contemporary research experiences to their teaching and, when appropriate, provide students with opportunities to participate in research,” “Academic staff … ensure that students develop research skills and research literacy,” “Students at UWA are aware that research informs their learning activities,” and “[Students] participate in research, learn the skills of research and produce research outcomes.”

New Courses Framework

The introduction of the New Courses in 2012 was intended to embed research skills development into the curriculum. This followed a recommendation from *Courses for Tomorrow’s World: An Issues and Options Paper on the Structure of Academic Programs at The University of Western Australia* (2007), which cited the Boyer Commission’s report (1998) advocating “a move from traditional lecturing to inquiry-based learning, where learning through research is introduced into the curriculum from the beginning of tertiary study.” *Courses for Tomorrow’s World* argued for student research “at all levels of tertiary study.” The paper declared that research and the utilisation of research or inquiry-based methods in teaching and learning “are increasingly important in a world that requires graduates to be lifelong learners.” The report noted that research could take “many forms,” including exposure to the latest research, the learning of research skills, and the undertaking of a research project.

This argument was reinforced by *Education for Tomorrow’s World: Report of the Review of Course Structures: The University of Western Australia* (2008) and *Embedding Research Working Party Report: Future Framework Implementation* (2009). The first report announced that undergraduate units would include “a demonstrable emphasis on inquiry-based learning and research skill[s] development, introducing students directly to the research culture of the relevant discipline and fostering independent study,” while the second report declared that the embedding of research must be reflected in the following three aspects: Curriculum content (what has to be learned – e.g. discourse conventions that must be taught); Pedagogy
(how the learning occurs – e.g. field work, lab classes); and Assessment (how students demonstrate what they have learned – e.g. essays, exams).

Honours
From the inception of the New Courses in 2012, UWA has been firmly committed to providing for the four-year integrated Bachelor of Philosophy (Honours) as well as an end-on Honours year for each of the four, three-year undergraduate degrees. A total of 57 end-on Honours courses are offered at UWA, with stable and sustainable enrolments of about 500 students in total per year, or between 10–13% of the previous year’s Level 3 cohort (The University of Western Australia 2017). Most end-on Honours courses include a 24-point research dissertation (with one exception). Honours enrolments are in strong demand in several disciplines, particularly in the Bachelor of Science and the Bachelor of Arts (The University of Western Australia 2017). The progression of Honours graduates to postgraduate study at UWA has declined in recent years from 20% in 2009 to 12% in 2012. However, from 2012 to 2015 the percentage of Honours students progressing to professional courses more than doubled from 4% to almost 11% (The University of Western Australia 2017).

The Bachelor of Philosophy (Honours)
The introduction of the Bachelor of Philosophy (Hons) in 2012, while available only to a select number of high-achieving students (75 per year), exemplifies UWA’s increased focus on research-led teaching. The BPhil (Hons) includes an “especially intensive research focus” (The University of Western Australia 2008), and is designed so that students will “learn to think like a researcher,” as noted in unit outlines taken by BPhil (Hons) students. Beginning their first-year research training in the foundational unit GCRL1000 Global Challenges, Research and Leadership, BPhil (Hons) students progress to research placements in their second and third years, and conclude with Honours-level coursework and a dissertation. The second phase of the Review of Courses reported to Academic Board in 2017 that the Bachelor of Philosophy has continued to attract exceptionally high-achieving Western Australian students and that one of the strengths of the program is the research training component (The University of Western Australia 2017).

Communication and Research Skills Unit (CARS) and Academic Conduct Essentials (ACE)
Another example of UWA’s increased focus on research-led teaching is the implementation of the research-based non-credit module Communication and Research Skills (CARS). Since the introduction of the New Courses framework, all incoming students must complete the following three online modules as additional requirements of their undergraduate degree: Communication and Research Skills (CARS), Academic Conduct Essentials (ACE), and Indigenous Studies Essentials (ISE). The aim of CARS is to assist all undergraduate students to develop basic communication and research skills in an academic context. Students work through a series of five online modules: Starting your assignment, Finding the best evidence, Writing your assignment, Delivering your oral presentation, and Working in teams. With ACE, students learn about academic integrity, ethical scholarship, intellectual property, and the adoption of good study practices. The 2015 Review of Courses recommended that the University Librarian review the CARS module with a view to better connect it with communication and research skills training in the undergraduate majors (The University of Western Australia 2016).

Other Examples of Research-led Teaching at UWA
As part of this project, feedback was sought from staff and students in the UWA community about exemplary cases of research-led teaching, examples of professional development in schools and faculties, and general feedback about expanding research-led teaching in the curriculum. The findings of this consultation including case studies are presented in Appendix
C (along with a list in Appendix D). In summary, submissions for around 90 units and programs were received, highlighting a variety of examples of research-led teaching in faculties and programs, which include experiential learning, industry engagement, and real-world application. Examples of blended learning, flipped classrooms, group-based learning, and scaffolded learning activities were mentioned as methods of building students’ research and higher order thinking skills. Some teachers had also presented conference papers and published peer-reviewed papers on research-led teaching.

Our exploration of the UWA context indicates that, as a research-intensive university, there are strengths and areas for improvement regarding research-led teaching. Research-led teaching at UWA appears to be much more than simply bringing the latest research findings and knowledge into the classroom. Research-led teaching at UWA is complex and multilayered, involving the teaching of research skills, employing evidence-based teaching strategies and pedagogies, enabling students to engage with inquiry-based learning by asking questions and developing their own research programs, as well as encouraging them to become life-long inquirers, independent learners, and active problem solvers. Due to the complex and multi-layered nature of research-led teaching, the following section proposes a framework for research-led teaching at UWA that will enable staff and students to better understand how and why UWA has research-led teaching as its focus.

A Framework for Research-led Teaching at UWA

In order to improve staff, student, and community understanding of research-led teaching at UWA and in order to focus its research-led teaching strategy, this section of this report proposes a framework for research-led teaching at the University. The framework consists of five interrelated pillars as outlined in Figure 1, including: 1. Engaging students with UWA research and researchers; 2. Teaching of research skills; 3. Students undertaking inquiry learning; 4. Staff scholarship in higher education research; and, 5. Utilisation of evidence-based pedagogy.

![Figure 1: The five pillars of a proposed framework for research-led teaching at UWA.](image-url)
The next section expands on this proposed framework and makes recommendations about how UWA can enhance research-led teaching within the five pillars.

**Recommendations to Enhance Research-led Teaching at UWA**

This section of the report makes a number of key recommendations for enhancing research-led teaching at UWA based around the five pillars of the framework proposed in the previous section.

**Pillar One: Engaging Students with UWA Research and Researchers**

Leading research universities often emphasise the quality of their research and the access that students will have to that research. For instance, Imperial College London lists extensively both its research credentials and the research experience that prospective students can expect. A webpage on research-led education notes that, “Imperial has been home to so many pioneers over the years, from Alexander Fleming, discoverer of penicillin, to Dennis Gabor, inventor of holography” and that “Many of our researchers are directly involved in undergraduate teaching so you get to experience their expertise first hand in your lecturers, seminars and reading materials” (Imperial College n.d.).

The extent to which the latest research intersects with teaching varies according to the discipline (with creative disciplines reporting more of a connection) (Trowler and Wareham 2008), but the leading argument is that access to cutting-edge research will in turn enrich the students’ learning and research experience. This approach is yet another way to connect students with teachers and the research that affect wider society. Dilly Fung (2017) of University College London (UCL) puts it thus:

> The distinctiveness of research universities is that areas of knowledge, analysis and practice, across a wide range of academic disciplines and professional fields, are constantly being enlarged and refreshed. This research is extraordinarily rich and varied, both in terms of its areas of focus and of the activities that researchers undertake. Through research, new understandings, practices and technologies are developed, skills are honed, and ethical issues are uncovered. These can all have a powerful effect not only on researchers themselves but on wider society. Yet students are not always familiar with the research being undertaken in the sector, in their own institution or even in the department in which they are studying.

Fung is leading UCL’s new Connected Curriculum framework, which aims, among other things, to ensure that all students are able to learn by participating in research and inquiry at all levels of study. The importance of students connecting with researchers and with the institution’s research is underscored by this aim being the first of the Connected Curriculum’s six dimensions. Fung’s recently-published book (2017) on the UCL framework offers practical tips for connecting students with researchers.

**Recommendation 1:** UWA audits and promotes current opportunities for coursework students in all units to engage with its researchers.

**Recommendation 2:** UWA audits and promotes opportunities for students in all units to learn about the cutting-edge research being conducted at the University.

**Pillar Two: Teaching of Research Skills**

A review of the New Courses conducted in 2015 reported to Academic Board in February 2016 that, “the Review Panel acknowledged the new courses have made some inroads with regard to the embedding of research skills in majors across the four three-year
undergraduate degree" (The University of Western Australia 2016). Students responding to a survey conducted as part of the review valued research skills being taught in their major (88%) and could identify when research skills were being taught (83%). Overall, about two-thirds of the approximately 3,000 students surveyed (64%) felt that the research skills training in their majors was of excellent quality. However, the Review Panel recognised that there were still very few opportunities for students within certain majors to develop or be introduced to the research skills needed for postgraduate study and affirmed that UWA should continue to enhance the embedding of research training within majors. The UWA Curriculum Management Unit maps the research skills taught within each major and postgraduate coursework courses. However, no University-wide review or audit of the research skills being taught and assessed has been undertaken since the inception of the New Courses in 2012. An audit of the research skills taught in all majors and postgraduate courses with a view to enhancing the teaching of research skills is likely to improve research-led teaching at UWA.

Recommendation 3: Course and major coordinators audit and enhance the teaching of research skills in all undergraduate majors and postgraduate coursework courses to ensure a connected sequence of learning activities that empowers students to apply research skills including critical thinking.

Pillar Three: Students Undertaking Inquiry Learning

The growing consensus around the importance of undergraduate research and inquiry originates from the argument that students should graduate with higher order thinking skills that prepare them for an increasingly complex society and economy. These qualities are developed especially well through research and inquiry-based learning opportunities. Unsurprisingly, inquiry-based, independent learning is “at the heart of the student experience in Russell Group universities.” This approach to learning encourages students to develop, among other things, “the independence of thought, critical thinking and entrepreneurial skills and ability to handle uncertainty and new problems” (Russell Group n.d.). Most of the literature on inquiry-based learning or undergraduate research indicates the positive effect of the research experience on student learning outcomes, given that engagement in processes of inquiry is conducive to the development of critical thinking and research literacy (Elken and Wollscheid 2016).

UCL’s Dilly Fung (2017) recommends that “each programme of study needs to be designed in such a way that students experience a connected sequence of learning activities that empower them, step by step, to apply the skills and dispositions needed to undertake investigations.” UCL recently overhauled its curriculum to ensure that all students are able to learn by participating in research and inquiry at all levels of study. The importance of students connecting with researchers and with the institution’s research is underscored by it being the first of the Connected Curriculum’s six dimensions.

UCL and other leading research universities in the UK and North America host at least one student-run undergraduate research journal, while others host several. Undergraduate research symposia and conferences are a common feature of North American universities in particular (examples can be found in Appendix A).

The British Conference of Undergraduate Research (BCUR) promotes undergraduate research from all disciplines. Founded in 2010, the conference meets annually at a different British university. Undergraduates of all levels are invited to submit peer-reviewed abstracts for papers, posters, workshops, and performances to the conference. BCUR also accepts submissions from students outside of the UK. Like the BCUR, the Australasian Conference of Undergraduate Research (ACUR) is held each year at a different university. This year’s ACUR took place over two days in September at La Trobe University, and included spoken
presentations by undergraduate students, 2018 Honours students, Master of Research students (first year only), and graduated 2017 Honours students from all disciplines and from across Australasia. UWA hosted the ACUR in 2015.

As mentioned, one of the aims of UWA’s New Courses was to introduce students to deep and inquiry-based learning through research participation: students learn the skills of research, participate in research, and produce research outcomes. Examples include students working on research projects with mentors, resulting in peer-reviewed publications and/or publishing their research in discipline-specific or public forums. Embedding a research culture into UWA’s courses means developing activities and assessments that promote inquiry as well as intellectual curiosity and research-driven solutions. In short, it means promoting the conditions necessary to enhance the intellectual skills and outlook necessary for lifelong learning. Appendix C provides numerous examples of these types of units that are currently taught at UWA.

As reported above, a total of about 500 students per year, or between 10-13% of the previous year’s Level 3 cohort, complete Honours (The University of Western Australia 2017). The number of students engaging with research-led teaching by conducting their own inquiry through Honours could be greatly enhanced if the number of students doing Honours is increased.

**Recommendation 4:** UWA explores means to engage the broad student population in research through benchmarking practice globally; through exploration of innovations regionally e.g., the Australasian Council of Undergraduate Research (ACUR); through encouraging student conferences and publications; and through global partnerships with world-leading research-intensive universities.

**Recommendation 5:** Faculties increase the number of students participating in Honours annually, with a progressive improvement from the current base of 10-13%.

**Recommendation 6:** UWA implements electronic badging of units to incentivise and highlight research-led teaching in undergraduate majors and postgraduate coursework courses.

**Pillar Four: Staff Scholarship in Higher Education Research**

Higher education is a research tradition with a strong scholarly community in which academic staff worldwide can participate as researchers or to learn as practitioners with the aim of enhancing their practices based on educational research findings. Internationally there are a number of organisations including the American Education Research Association (AERA) and the National Education Association (NEA) in the US, the Higher Education Academy (HEA) and the British Educational Research Association (BERA) in the UK, amongst others that promote research and scholarship in higher education.

In Australia, the Higher Education Research and Development Society of Australia (HERDSA) is a scholarly society for people who are committed to advancing and improving higher and tertiary education. This society encourages and disseminates research on higher education and tertiary teaching, learning, development, research, leadership, and policy matters. HERDSA has an international refereed journal called *Higher Education Research and Development* (HERD) published six times per year; an annual *Review of Higher Education* available freely online with commissioned articles written by experts in the field; good practice guides based on current scholarship that can be purchased online; an annual

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1 See [www.herdsa.org.au](http://www.herdsa.org.au).
international conference and network meetings, including in Western Australia under the guise of the Western Australian Network for Dissemination (WAND).

**Recommendation 7:** UWA encourages and supports staff to actively participate in higher education scholarly societies, for example, by making available HERDSA communications, promoting HERDSA conferences and other meetings, and offering to pay registration for presenters at the WA and national HERDSA forums and conferences.

**Recommendation 8:** UWA enhances reward and recognition of the scholarship of teaching by giving points in Socrates Teaching and Learning for active membership and participation in scholarly societies that promote and support evidence-based pedagogy.

Since the start of 2014, The Australian National University (ANU) has been a subscribing institution of the Higher Education Academy (HEA) and is accredited to award professional recognition in four categories of the HEA fellowship scheme including associate fellow, fellow, senior fellow, and principal fellow. Similarly, in 2016/2017, The University of Queensland piloted a scheme to award 22 staff with HEA fellowship titles in a ceremony held in mid-July 2017. A further round of awards has been announced. The HEA fellowship scheme is aligned with the UK Professional Standards Framework, developed in 2011 to support teaching and learning in higher education. The HEA fellowships provide professional recognition of academic and professional staff who can demonstrate experience in, and knowledge of, teaching and learning; have engaged with relevant professional development; and, are committed to acting as an educational professional. In particular, the title of Principal Fellow is awarded to staff with recognised institution-wide, national and/or international leadership in teaching and learning in higher education.

**Recommendation 9:** UWA considers the HEA Fellowship Scheme for the ways in which it recognises staff in relation to research-informed teaching.

**Pillar Five: Utilisation of Evidence-based Pedagogy**

UWA aims to be a global leader in university education. In restating UWA’s *Education Futures: Our Vision* document, the *UWA 2020: Strategic Plan 2014–2020* declares that “Teaching practices at UWA will be designed to engage, challenge and transform students throughout their courses,” and that “UWA will provide evidence-based, quality teaching practices” (2013b). Evidence-based teaching strategies are therefore a high priority. In a number of prestigious universities, evidence-based teaching strategies underpin approaches to research-led teaching. For example, the Derek Bok Centre for Teaching and Learning at Harvard University defines research-based teaching as evidence-based pedagogy and provides considerable resources to enable staff at Harvard to incorporate teaching strategies that are supported by research evidence.

A recent paper in *Science* explored how academics are shaping their courses in order to incorporate more evidence-based, active learning strategies (Tachibana 2015). For example, active learning enables students to be involved in finding, interpreting, and explaining course material. There are many ways to engage students in active learning, ranging from implementing incremental changes to the lecture-tutorial/lab style, to flipping the classroom, to enabling independent student-led projects. Introducing a number of small and relatively easy changes could improve the instructional quality of courses (e.g., encouraging frequent class attendance, having stimulating questions and discussion, providing clear learning goals and course objectives, asking open-ended questions, having clarity of course objectives and requirements, and providing high quality feedback) (Schneider and Preckel 2017). While the authors of a recent review article of higher education literature noted that the evidence appears to suggest that blended learning, i.e., a mix of online and classroom learning, is more effective than classroom or online learning alone, they also asserted that lectures are
still “a timely and effective form of instruction provided they are given in an engaging and interactive way” (Schneider and Preckel 2017). The vast majority of UWA’s undergraduate majors and postgraduate courses are primarily lecture based. Nonetheless, lecturing has been shown to be one of the weakest forms of pedagogy in terms of encouraging engagement and supporting learning (Hattie 2009). It is important that UWA staff move away from traditional lecture-based, teacher-centred models that are clearly less effective and engaging for student learning, and move towards evidence-based pedagogies. Supporting staff to engage with the scholarship of higher education would partly enable this to happen. However, more focused support and incentives should result in improved utilisation of evidence-based pedagogies in UWA teaching spaces.

**Recommendation 10:** UWA reviews SURF and SPOT surveys with a focus on evidence-based pedagogical strategies.

**Recommendation 11:** UWA incentivises the utilisation of evidence-based pedagogy through Socrates Teaching and Learning.

**Recommendation 12:** UWA incentivises and supports the utilisation of evidence-based pedagogy through grants and awards.

**Recommendation 13:** UWA provides professional development that supports the use of evidence-based pedagogy.

**Conclusion**

Research-led teaching, in particular, the teaching of research skills and the engagement of students in inquiry learning, were hallmarks of the New Courses framework introduced in 2012. However, there are considerable additional opportunities for UWA to further leverage the exciting and cutting edge research being conducted by integrating it into the classroom with a view to improving the student experience.

**Next steps**

This paper was sent to the Academic Board for input and has been approved by Vice-Chancellor Professor Dawn Freshwater. We are currently consulting with UWA staff and students over the paper and welcome your feedback around the recommendations proposed. Feedback from the UWA community will inform UWA’s education strategy.
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Appendix A: International Examples of Research-led Teaching

United Kingdom

University of Cambridge

The Cambridge Centre for Teaching and Learning discusses research-led teaching as follows: “When most people say ‘research-led teaching’, they seem to mean teaching that is ‘research-based’, in which students learn through research or enquiry. In fact, ‘teaching’ is a bit of a misnomer – it’s really students learning through doing research. On the webpage, “Why Cambridge,” the Vice-Chancellor writes, “A Cambridge education offers you the chance to engage with academics at the forefront of cutting-edge research and to contribute to solving some of our global challenges. Here you will have the opportunity to pursue your intellectual curiosity and acquire the habits of mind which will enhance your future experience of life, whatever turn it may take.”

Imperial College London

Imperial College devotes several pages to promoting research-based activities to prospective students. The section on “Research-led teaching” denotes access to the breadth of research on offer and to “a wide range of advanced modules in the later stages of your degree.” Opportunities for cross-departmental learning are also featured. Imperial claims the following: “We also place a lot of emphasis on analytical and problem solving skills, encouraging you to develop as an independent thinker who can formulate their own theories and ideas. This is why our degrees have been designed to give you increasing freedom as the course progresses. This allows you to tailor your education to your own interests and career plans with the support of staff who are leaders in their field.” Imperial was the first UK institution to introduce the UROP, which has around 300 opportunities available per year, several of which have led to published scientific papers. Imperial College promotes other research opportunities for students: the final-year research project, research expeditions, supporting roles at Imperial Festival and Imperial Fringe (their version of UWA Research Week), and access to "Meet our new professors" lecture series and the prestigious annual lectures series which has included Nobel Laureate speakers. Imperial promotes research activities through team challenges, such as the FoNS-Make-a-Difference: Impact Challenge, in which teams from the Faculty of Natural Sciences compete for prizes of up to £6000 by developing low-cost technology that would have a social impact.

Featured case study: Sports Innovation Challenge

A flagship curriculum program that challenges cross-disciplinary engineering students from second year through to MSc students to design, build, and implement Paralympic sporting equipment. The Sports Innovation Challenge provides students with real-world engineering problems to make a tangible contribution to Paralympic sport and healthy lifestyles for disabled people. Showcasing events enable students to exhibit the projects and compete against each other for prizes and additional support to take their projects further.

See: https://www.imperial.ac.uk/engineering/study/current/sports-innovation-challenge/

University of Oxford

The University of Oxford does not appear to explicitly mention research-led teaching or variations on this term on their website or associated documentation. However, summer research placements (with bursaries) appear to be available in select faculties, e.g. physics.
University College London

The Connected Curriculum of University College London (UCL) puts it at the forefront of research-led teaching. In the UCL 2034 strategy, under the theme of “Integration of research and education,” UCL states its commitment to becoming “A global leader in the integration of research and education, underpinning an inspirational student experience.” For example, “Our students will participate in the research process and the creation of knowledge, supported by our academic and research staff. They will understand the ‘edge of knowledge’ and learn how to deal with uncertainty. Through this integrated approach, they will develop their critical independent thinking skills, become confident problem solvers, be well versed in communicating complex information and experienced at working in a team. With these skills, our graduates will excel in the workplace and be highly valued contributors across all walks of life.” The Education Strategy 2016–21 outlines how over the next five years UCL will implement its “research-based” education. UCL’s Teaching and Learning website contains a host of case studies demonstrating inspiring teaching practices and projects taking place around UCL.

Featured case study: SPAN4415 Reading and Writing Spanish Microfiction
With origins in his own work, Dr Tyler Fisher developed an innovative final-year undergraduate module giving students the opportunity to rigorously analyse Spanish texts and to critique one another’s work collaboratively. The module content was a direct, natural outgrowth of Dr Tyler’s published research on contemporary Spanish microfiction, as well as his own published microcuentos (very short stories of no more than one page in length). The module ran for the first time in the 2015-16 academic year, and is now in its second iteration. The first cohort of students published a collection of their microfiction in Spain last month. “Reading and Writing Spanish Microfiction” bridges the gap between conventional literary modules and language modules, creating a hybrid intellectual space in which both analytical and creative, imaginative literary writing practices are developed in the context of supportive but critical peer scrutiny. Its use is informed by the conviction that students learn to internalise the criteria for different levels of intellectual performance through review of one another’s work. To some degree, the classroom activities mirror the pedagogic practices of studio-based subjects in art and design faculties in which periodic review or “crits” are an integral part of the student learning experience. The initial weeks of the module focus on critical reading, rigorous analysis, and reflective imitation of microfiction by established authors. Students gain insight into an author’s creative work as a process of revision, rather than of unattainable genius ex nihilo. The module progresses from imitations to allusive compositions to more original drafts. Students collaborate on drafts via the module’s Moodle forum. Ultimately, students select five of their compositions for their final portfolios, which include critical self-commentaries on their work. The portfolio (in lieu of an exam) and one standard essay on published microfiction constitute the module’s summative assessment. Taken together, these forms of assessment display the students’ critical reflection and creative application working in tandem.

See: https://www.ucl.ac.uk/teaching-learning/case-studies/2017/mar/encouraging-students-reflect-through-supportive-critical-peer-scrutiny

University of Exeter

One of the six strategic aims of the University of Exeter’s Education Strategy: 2014–2020 is to offer “Research-inspired, inquiry-led learning and discovery.” The aim is supported by enabling “every student to learn with the creators of world-leading research,” and extending opportunities for students “to discover and learn in innovative ways through their own research and inquiry in each year of study.”
**Case study: Grand Challenges**

Grand Challenges is one way that Exeter leverages its position as a research-intensive university. Unique to the university, Grand Challenges is a week that is open to all undergraduates from any discipline (particularly first-year students). By exposing students to a range of contemporary global challenges, students engage in interdisciplinary collaboration to create innovative solutions, supported by a range of experts. The program allows students to co-create some aspects of the Grand Challenges week. Solutions can be videos, social media campaigns, apps, games, events. Attracting more than 550 students, the themes for 2017 include climate change, sustainable food systems, global security, mental health, and Brexit. Grand Challenges encourages the Graduate Attributes from Exeter’s Education Strategy: an imaginative, critical thinker and problem solver; a creative and enterprising team player; an engaged leader able to effect change; a confident, resilient and adaptable individual; and an active and committed global citizen.

See: [https://www.exeter.ac.uk/grandchallenges/about/whatisgrandchallenges/#BjtiKluRmyBMhder99](https://www.exeter.ac.uk/grandchallenges/about/whatisgrandchallenges/#BjtiKluRmyBMhder99)

**North America**

**University of British Columbia**

University of British Columbia (UBC) is consistently ranked among the top 40 universities in the world. Its Vancouver campus is home to more than 39,000 undergraduate and 10,000 graduate students. UBC’s undergraduate research page emphasises schemes like UROPs and similar. UBC has an extensive list of teaching and learning case studies on their Flexible Learning webpages.

**Featured case study: Multi-Disciplinary Undergraduate Research Conference**

Students are invited to present new research (presentation or poster) for competition at the three-day conference to demonstrate the skills of critical and analytical thinking, creativity, collaboration, and communication. Students must be participating in, or have completed, their own faculty-supervised research project. The conference page includes the current year program, past conferences archive, contact details, and a resources page to assist students with writing their proposal and preparing their presentation. Academic staff members are also involved in workshops to help students sharpen their presentation skills. The 2017 conference featured over 200 research projects and over 344 presenters. One of the featured speakers was a recent graduate who discovered four new planets in her final year of study.

See: [https://students.ubc.ca/career/career-events/multi-disciplinary-undergraduate-research-conference](https://students.ubc.ca/career/career-events/multi-disciplinary-undergraduate-research-conference)

**Featured case study: From consumer to creator: PHYS 101 Energy and Waves students as producers of content**

To engage students with course concepts, Dr Simon Bates asked them to produce their own content with support from instructors. In PHYS 101, students created a learning object that helped explain a concept or idea from their pre-readings. In this enhanced flipped classroom, students moved from passive consumer to active producer and course collaborator, learning – and teaching their peers – by creating course content. Around 100 to 200 learning objects were submitted each week, and the instructors shared and used the best learning objects in
their lectures and tutorials. Twenty percent of the final exam was also comprised of student written problems. In order to create a collaborative learning community, students were asked to apply a Creative Commons license to their objects, so others could access and learn from their resources.


**Harvard University**

Harvard is the oldest and most prestigious university in the US. Honours include 48 Nobel Laureates, 32 heads of state, and 48 Pulitzer Prize winners. Harvard’s The Derek Bok Center for Teaching and Learning defines research-based teaching as evidence-based pedagogy, and provides a list of resources on evidence-based teaching.

**Massachusetts Institute of Technology**

Massachusetts Institute of Technology (MIT) is one of the world’s leading and most prestigious universities. It prides itself on its graduates’ entrepreneurial spirit, claiming that, according to a recent study, “as of 2014, living MIT alumni have launched more than 30,000 active companies, creating 4.6 million jobs and generating roughly $1.9 trillion in annual revenue.” The UROP originated in MIT. The program supports thousands of projects each year, with 90% of MIT graduating seniors participating in at least one UROP during their undergraduate years. The MIT Undergraduate Research Journal (MURJ) is MIT’s only peer-reviewed, student-run scientific journal that showcases MIT undergraduate research, usually conducted with academic staff or supervisors. MURJ enjoys strong relationships with the Alumni Association, the UROP office, and academic departments around MIT. It also features interviews with MIT’s esteemed professors and Nobel Laureates. The annual IEEE (Institute of Electrical and Electronics Engineers) MIT Undergraduate Research Technology Conference, initiated by students, brings together undergraduates from around the world to present, discuss, and develop solutions to advance technology for humanity. Participants attend a rich program with keynote speeches and technical flash talks featuring renowned speakers, a student design competition, and networking events.

**Featured case study: Terrascope**

The Terrascope program is founded on the belief that first-year students are ready to start taking on the world’s biggest problems. The cornerstone of the Terrascope program, Subject 12.000: Solving Complex Problems, offers them this chance as soon as they arrive at MIT. 12.000 students are given an important, complex, real-world problem to solve as a group: their Mission. Throughout the fall semester, students work in teams on a plan for solving the problem, ultimately publishing their solution on a comprehensive website. The culmination of the experience is a public presentation, in which students present and defend their ideas to a panel of global experts. In 12.000, as in all Terrascope classes, students are in charge of the classroom experience. Academic staff and guest experts lead a few class sessions during the semester, but fundamentally it is up to the students to decide, collectively, how to tackle the Mission: how to divide into teams, what approach to take, how to obtain necessary information, and how to manage the entire problem-solving process. Academic and professional staff, Undergraduate Teaching Fellows, Alumni Mentors, and librarians are available for support, but the types and methods of support needed are guided by the students. In 2017, Terrascope students will work to develop ways in which communities around the world can prepare themselves for the impacts of climate change. They will propose real solutions that could be put in place in Cambridge, Massachusetts (MIT’s home) and in another community elsewhere in the world, thereby gaining perspective on the varying threats that different communities face.
California Institute of Technology

California Institute of Technology (Caltech) is a leading science and engineering institution, consistently ranked in the top ten universities. Its official mascot is a beaver, paying tribute to nature's engineer. The student-faculty ratio is 3:1. Caltech’s version of the UROP includes student-faculty programs such as the SURF (Summer Undergraduate Research Fellowship), one of Caltech’s “crown jewels.” Since 1979, SURF students have had the opportunity to conduct research under the guidance of experienced mentors working at the frontier of their fields. What sets the SURF apart from many UROP experiences is that students experience the process of research as a creative intellectual activity from beginning (defining and developing a project) to end (presenting their results at SURF Seminar Day). The program is funded by annual gifts and contributions to the SURF endowment.

Stanford University

The first words that students see on Stanford’s Academics page are: “Stanford students create and apply knowledge by thinking and doing, preparing for leadership in a rapidly changing world.” Student-faculty ratio is 4:1. Students are encouraged to “Get Inspired” and undertake independent projects, from the arts to the sciences. Their undergraduate research website has information on how to develop a mentor relationship with an academic staff member, how to develop a “research toolbox” (i.e., the elements required to conduct research), how to build an independent research project, and how to work with human subjects.

Featured case study: Stanford Undergraduate Research Journal (SURJ)

Students have the opportunity to publish in the Stanford Undergraduate Research Journal (SURJ), which provides a forum for the exchange of research and ideas. Founded in 2001, the student-run journal is an annual, peer-reviewed publication of research articles from all academic fields. The journal is run entirely by a staff team of Stanford undergraduate students, led by two Editors-in-Chief. The papers are submitted, reviewed by the journal’s team of editors, and published under one of SURJ’s four sections: Social Science, Natural Science, Engineering, and Humanities. New volumes of SURJ are released annually in print and on the web, and are distributed across the Stanford campus and beyond. Articles published in SURJ have been cited in major peer-reviewed journals from a wide range of disciplines.

University of California, Los Angeles

University of California, Los Angeles (UCLA) claims to be “the most applied-to university in the nation” and has an active portfolio of almost 3,000 inventions and more than 900 patents. UCLA promises prospective students “countless opportunities for research, community outreach and connecting with major players in almost any field.” And also: “From Chinese linguistics to volcanic geology, we delight in the intellectual curiosity of our students, and take pride in their research accomplishments. We include them on cross-disciplinary teams, and even publish academic papers as co-authors.” Undergraduate Research Week showcases undergraduate research and creative projects across disciplines. Open to undergraduate students in all majors, the week provides opportunities for students to present their work to the UCLA campus community, alumni, and visitors. In the first three years of holding the event, participation has grown to over 800 student participants. One of the highlights of the week is the awarding of the UCLA Library Prize for Undergraduate Research, which recognises and honours excellence in undergraduate research at UCLA.
Featured case study: Undergraduate researcher as a first author

UCLA undergraduate Brandon Berg was the first author of a study to develop a new mobile phone-based device that can detect a number of diseases (including HIV and potential allergens in food) with the same level of accuracy as the large machines normally found in clinical laboratories. Two other undergraduates also contributed to the research.


University of Chicago

The College Center for Scholarly Advancement (CCSA) helps undergraduates navigate the broad array of institutional, domestic, and international research opportunities available to them. The CCSA encourages students to make research a fundamental part of their academic experience at the University of Chicago. At Chicago, the term “undergraduate research” encompasses research, scholarship, and creative endeavours, recognising that examples may range from historical scholarship, art exhibitions, and laboratory experiences to music composition, data analysis, and creative writing. Chicago has a number of undergraduate journals, ranging from the disciplines of law to Chicago studies.

Johns Hopkins University

On its landing page, Johns Hopkins prides itself on being “America’s first research university.” Johns Hopkins couches research in the language of discovery and within a partnerships model. Students are informed that, “Every day, our faculty and students work side by side in a tireless pursuit of discovery, continuing our founding mission to bring knowledge to the world… [E]very student here – no matter his or her major – is an investigator.” Various programs and fellowships exist for students to engage in research. Design Day offers a chance for students in the engineering disciplines to prove that they can translate theoretical knowledge into creative, practical solutions to real-world problems. Student teams make presentations about their designs to sponsors and mentors from industry and government, academic staff, clinicians, and fellow students. Presentations include prototypes, posters, and demonstrations, or a combination thereof.
Appendix B: Australian Examples of Research-led Teaching

This section focuses on the Group of Eight (Go8), comprising Australia’s eight leading research universities: The University of Melbourne, The Australian National University (ANU), The University of Sydney (USyd), The University of Queensland (UQ), The University of Adelaide, Monash University and The University of New South Wales (UNSW). UWA, also a Go8 member, will be discussed in Appendix C.

The University of Sydney

The University of Sydney 2016–2020 Strategic Plan expresses “our deep commitment to undergraduate education, and our intention to transform that experience, so that our students will graduate with skills that prepare them not only for the careers they can envisage now, but for a future that none of us can at this moment imagine.” With the new undergraduate curriculum, USyd promises to create graduates who excel in higher order thinking skills: “We’ve reimagined the Sydney Undergraduate Experience … to prepare you for a future full of possibilities,” such that every USyd student will “graduate with the confidence and ability to think critically, collaborate productively and influence the world.”

Featured case study: “Unlearn”

USyd’s new undergraduate curriculum introduces an optional combined Bachelor of Advanced Studies degree, a four-year degree program that enables a double major, advanced coursework, and a substantial project. The combined undergraduate degree focuses on disciplinary depth and cross-disciplinary problem-solving for real-world industry, community, and research challenges. It offers students access to advanced modules, entrepreneurship and leadership skills, broadening their opportunities for future success. Research-led teaching is not mentioned, but it is clear that research-based activities will be included in the substantial project and at least some of the advanced coursework.

See: https://sydney.edu.au/study/find-a-course/undergraduate-courses/bachelor-of-advanced-studies.html

The University of Melbourne

Melbourne University’s Strategic Plan 2015–2020 promises the following: “The University will provide more opportunities for a research-led experience within coursework degrees, such as capstone or research subjects and an extension of the undergraduate research opportunities program.” The capstone is part of the final year at Melbourne, and may involve, among other things, problem-based learning, project-based learning, and case study analysis.

The Australian National University

Apart from statements about being innovative in teaching, there are few details of research and teaching in the Strategic Plan 2017–2021. However, the Centre for Higher Education, Learning and Teaching (CHELT) includes a self-paced online module on the “Basics of research-led education” as part of its ten-module Foundations of University Teaching and Learning. Since the start of 2014, ANU has been a subscribing institution of the Higher Education Academy (HEA) and is accredited to award professional recognition in four categories of the HEA fellowship scheme including associate fellow, fellow, senior fellow, and principal fellow. The fellowship scheme is aligned with the UK Professional Standards Framework, developed in 2011 to support teaching and learning in higher education. Applicants write a reflective narrative of their experience regarding university teaching and learning. CHELT supports ANU staff to meet the criteria for the fellowship scheme. The HEA
fellowships provide professional recognition of academic and professional staff who can demonstrate experience in, and knowledge of, teaching and learning; have engaged with relevant professional development; and are committed to acting as an educational professional. In particular, principal fellows are awarded to staff with recognised institution-wide, national and/or international leadership in teaching and learning in higher education. According to the website, more than 300 members of the ANU community and more than 200 external colleagues have been awarded HEA fellowships through the ANU fellowship scheme.

The University of Queensland

Headed by the Pro Vice-Chancellor (Teaching and Learning), UQ’s Institute for Teaching and Learning Innovation (ITaLI) operates on a project basis. Projects are various and include “Students as Partners,” which involves harnessing student and staff creativity via the collaborative partnerships model endorsed by The Higher Education Academy (HEA). Another UQ-based project is ALURE, an OLT National Leadership Project; ALURE stands for Authentic Large-Scale Undergraduate Research Experience. Project researchers conducted an extensive series of discussions with Australian tertiary science educators to develop a feasible and sustainable model of ALURE. The model, finalised in 2013, serves large numbers of undergraduate students (for groups of 50–500 or more), occurs in undergraduate teaching spaces during regular class time, and provides an opportunity for students to generate new knowledge.

Featured case study: Students as partners in fourth-year Engineering unit Product Design

In this unit, students are in charge of course delivery and assessment. The aim is for students in the final year unit to own their own learning and to increase buy-in and engagement. In the first week, a draft unit outline is discussed in class, along with learning outcomes, delivery methods, etc. Students are given a week to provide suggestions to unit changes, with 3% assigned to the task. In week two, students discuss their responses and debate proposals for change until a consensus is reached. The syllabus is then revised and carried out. Changes have pertained to the trivial (e.g., change of submission date), the social (e.g., use of prize money for a cohort celebration), content matter (e.g., inclusion of an experiential field trip to a trade show), and delivery (e.g., increase in the number of industry guest speakers). Students often rate the unit as one of the best in the program, a fitting capstone unit that aids their transition to industry, by treating them as equals in the learning process.

See: http://itali.uq.edu.au/content/case-studies

Featured case study: Authentic Large-Scale Undergraduate Research Experience (ALURE) in Mapping the Human Oral Microbiome

The case study was published as the article, “Do You Kiss Your Mother with That Mouth? An Authentic Large-Scale Undergraduate Research Experience in Mapping the Human Oral Microbiome” (Wang et al. 2015). The inquiry-driven laboratory training needed in order to prepare microbiology graduates for the professional environment can be difficult to replicate within the undergraduate curriculum, especially in units accommodating large student cohorts. The team aimed to improve undergraduate scientific training by engaging hundreds of introductory microbiology students in an ALURE. Students studied the microorganisms (oral microbiome) that reside in the healthy human oral cavity by analysing hundreds of samples obtained from volunteers within the unit. Pre- and post-survey analysis of student learning gains across two iterations of the course (2012–2013) revealed significantly higher student confidence in laboratory skills following the completion of the ALURE. The conclusion is that the integration of undergraduate research in clinical microbiology has the
capacity to deliver authentic research experiences and improve scientific training for large cohorts of undergraduate students.

See: [http://www.alure-project.net/what-we-do/](http://www.alure-project.net/what-we-do/)

**The University of New South Wales**

UNSW's Learning and Teaching website includes information on multiple styles of teaching. The emphasis is on blended and online teaching, which includes multiple pages as well as examples or case studies of successful units (e.g., unit code and description, evidence of course effectiveness, ability for staff to self-enrol to gain a student view of the unit, and a short video of the academic and student perspective of the unit). Spanning multiple disciplines and approaches to blended learning, the units range from small to large class sizes. However, most of the details of the case studies are password protected.

**Monash University**

For potential students, Monash claims to “offer industry experience and opportunities to take on internships and volunteer roles and we build a range of important skills into our curriculum, so that no matter which course you choose, you graduate with the communication, analytical and research skills all employers want.” Under the section, “Research and industry-led teaching,” Monash informs students that it “creates knowledge, as well as delivering it. We’re a highly regarded research university tackling some of the world’s biggest issues, and producing ground-breaking research.”

**The University of Adelaide**

This year, Adelaide has partnered with University College London and McMaster University on a new international conference series called “Connecting Higher Education: International perspectives on research-based education.” Adelaide will host the conference in 2018. Adelaide’s “Small-Group Discovery Experience” is a pedagogical approach and a key component of its Beacon of Enlightenment pedagogy. Based upon the values and practices of the Humboldt Model, the Small-Group Discovery Experience places importance on the collaboration between undergraduate students and researchers who work together in small groups to make new discoveries. Through the Beacon of Enlightenment strategy, Adelaide has made a commitment to increase the centrality of small-group learning, in which students work together with a staff mentor in pursuit of new discovery. Adelaide has committed to provide all students commencing in 2014 with a Small-Group discovery experience in at least one course, every year of their degree. In August 2017, Adelaide hosted its third annual Beacon Conference of Undergraduate Research (BeaCUR). BeaCUR offers an opportunity for students and recent graduates to showcase research completed as part of their undergraduate coursework, a summer or other research internship, a research-based degree program, or voluntary work.
Appendix C: Findings from Consultation on Research-led Teaching at UWA

We sought feedback from UWA staff and students about exemplary cases of research-led teaching, examples of professional development in schools and faculties, and general feedback about expanding research-led teaching in the curriculum. We consulted widely with faculty representatives and unit coordinators. We also contacted heads of school to request that our call for case studies and feedback be disseminated within their schools. Notifications of consultation were distributed through official staff and student channels: the Vice-Chancellor's Voice in UWA Forward, Guild Weekly, and the Postgraduate Students' Association (PSA) Newsletter. Representatives of main internal and external stakeholder groups were consulted. These included, among others, Academic Board and Council, Library, UWA Academic Staff Association, UWA Researchers' Association, Education Council, UWA Student Consultative Committee, Education Futures Strategy and Implementation Group, Centre for Education Futures, Future Students, Brand and Marketing, Development, Business Development (Industry Engagement), Innovation Quarter (IQ), Convocation, and employers.

Points of Interest

- We received submissions and mentions from faculties, schools, coordinators, and students for around 90 units and programs.
- Examples of research-led teaching are evident in the faculties, and include experiential learning, industry engagement, and real-world application.
- Blended learning, flipped classroom, group-based learning, and scaffolded learning activities were mentioned as methods of building up students' research and higher order thinking skills.
- Some disciplines/schools prefer to step up research-led teaching in their Masters courses.
- There was comment that the fundamentals of a discipline and experiential learning/practical experience were still necessary components of teaching and learning.
- Some teachers presented conference papers and published peer-reviewed papers on research-led teaching.

Classroom Case Studies

The following case studies (undergraduate and postgraduate) provide some of the most inspirational and detailed examples of research-led teaching received. They have been chosen to provide an idea of the breadth of teaching and learning around UWA. There were many more exciting case studies received than could be included, and therefore all of the submissions received or mentioned during the consultation period are listed in Appendix D. The case studies in the next few pages mostly focus on undergraduate and postgraduate coursework units. They do not include honours or dissertation units, where research training is necessary and expected. The main purpose of these case studies is to demonstrate that research-led teaching can be achieved, even when it is not expected.
First Year

BIOL1131 Plant and Animal Biology
Coordinator: Nicola Mitchell (and Tim Langlois from 2017)
Combining citizen science with inquiry-based learning to offer first year university students an authentic research experience

The global burgeoning of citizen science programs presents an opportunity for students to gather data that contribute to large and impactful projects. Through a partnership with EarthWatch that began in 2011, Nicola (Nicki) Mitchell introduced the citizen science program ClimateWatch into first-year Biology at UWA – the first university to do so. Two ClimateWatch “trails” were developed (one on the UWA Crawley campus and one at Lake Seppings in Albany) to train the students in data collection. Nicki introduced the Journal Project into first-year Biology, whereby teams conduct the first research on un-validated citizen science datasets, write scientific articles on their findings, peer-review each other’s work, and see the best work published in an online journal called Cygnus. This assignment provides opportunities for students to think critically and to care about the data they are collecting. The Journal Project also aims to teach students how to think and write scientifically in their first year at university. But the most novel aspect is that students are allowed to scrutinise a dataset that has not been appraised by professional scientists. While some conclusions reached by students are well argued but partially misinformed, many points raised are valid and have been taken seriously. For example, student research on the swift parrot (Vogel et al., 2014; Dumbrava et al. 2014) was used by Commonwealth Government staff when re-evaluating the threat status of this species. A thorough review of the project has been completed, and a peer reviewed paper was recently published in PLOS ONE. Evaluation of the project has shown that by embedding a research process within citizen science participation, university students are given cause to improve their contributions to environmental datasets.

ENGL1401 Page and Screen: Fiction in the Digital Age
Coordinator: Ned Curthoys
An online exercise promoting independent research, critical appraisal of articles, and peer-to-peer feedback

Since 2014, Ned Curthoys has instituted a simple research-led teaching strategy in his unit. One problem that teachers face is that first-year students in literary studies often need to change their mindset from high school in which they are taught formalistic essay writing techniques predicated on close thematic analysis of the text. As a result, many first-year students are still adjusting to the reality that the discipline is research based with a strong focus on historical context and a range of theoretically informed prisms of interpretation. In order to accelerate the student’s induction into advanced research skills, in week five of the unit there is no live tutorial but instead an online exercise using a discussion board in LMS. In that week, which is just prior to the submission of their essays, students are tasked with finding and then evaluating articles about one of the set texts as well as engaging in discussion of those articles by replying in some depth to the posts of other students. The objective of this online participation task, which is incorporated into the tutorial participation grade so students don’t feel too anxious about a separate exercise in academic writing, is for the student to engage in independent research, careful analytical thinking about the value of critical sources, and to provide and benefit from peer-to-peer feedback, which mitigates

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2 ClimateWatch is ideal for many reasons: it is fit for purpose (biology students can develop familiarity with their local biodiversity), it is flexible (data can be collected anywhere at any time), and it uses an attractive and informative web interface, mobile phone apps, and real-time portrayal of data capture to engage Generation Y students.
against some of the dangers of passivity in vertical learning models. This task – and indeed the unit as a whole – has been very well received. In the SURF evaluations for the unit in Semester One 2017, the unit received 3.5 for Question 2, 3.4 for Question 3, and 3.4 for Question 6 on overall satisfaction. Comments included: “Great unit … with well constructed assessment tasks and learning outcomes.”

**Second Year**

**ANTH2407 Australian Society**  
**Coordinator: Martin Forsey**  
*Integrating one’s research into a unit and shifting away from formal lectures towards extended workshop time*

After Martin Forsey developed UWA’s first MOOC (massive open online course), he knew he would not be lecturing in a standard face-to-face way again. Attending a workshop on research-led teaching by highly-cited educator Mick Healey also had an impact on his teaching. These elements have been brought together in Martin’s Australian Society unit, which centres around a qualitative research project. The unit introduces students to the sociology of Australian society, placing particular emphasis on the experiences of young Australians in a “second modernity,” in which the apparent certainties and securities of initial modernity have given way to globalisation, increased individualisation, underemployment, and global risks. The research assignment requires students to interview a young Australian and to write a sociological biography of that person. The main aim in shifting the pedagogical emphasis away from formal lectures towards extended tutorial time in the form of workshops is to allow greater training of students in qualitative research methods and sociological writing. This major assessment is informed by Martin’s published research on ethnographic interviewing. As an advocate of the flipped classroom, Martin uses multimedia to help students with their research, e.g., he has created videos on how to conduct online research, using himself to demonstrate it via a step-by-step process. Workshops become a collaborative space where peer feedback on student exercises is offered before the students complete their research project. Martin also provides guidance on tasks and scaffolding strategies, leading to an interactive learning experience built around a research focus. Students conduct original work that enables them to connect to the conceptual realm of the unit and to learn in a practical, personal way. One student said, “I’ve never spent so much time on a 500-word work before. It’s because I care about it so much.” The teaching of the unit has become a source of conference papers and articles on learning.

**HIST2014 The City in History**  
**Coordinator: Andrea Gaynor**  
*The benefits of group work and encouraging independent but supported individual inquiry*

Andrea Gaynor notes that there is a substantial body of research on group work and the benefits of collaborative learning. Her unit involves collaborative in-class work in teams for two purposes: 1) identifying key arguments in research papers and monograph chapters and comparing/responding to them, and 2) understanding, evaluating, critiquing, and responding to primary sources. In both workshop parts, original responses and innovative approaches to the material are encouraged. Recent cutting-edge articles and monograph chapters are assigned as readings, along with older foundational texts. Moreover, topics are often contextualised with reference to the relevant historiography, so students have an

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4 See [https://www.youtube.com/watch?v=097PGwzAc8Q](https://www.youtube.com/watch?v=097PGwzAc8Q) and [https://www.youtube.com/watch?v=on5bd20oi6k](https://www.youtube.com/watch?v=on5bd20oi6k)
appreciation of how historians have researched and written about the topic over time. The major assessment items for this unit require each student to develop an individual research essay proposal and annotated bibliography on a question of their own choice. Students receive feedback on the proposal before they proceed to research their topic and write their essay. The research assignment and feedback process encourages independent but supported inquiry, and cultivates lifelong learning skills in formulating and addressing research questions.

**ENVT2250 Ecology**  
**Coordinators: Raphael Didham and Erik Veneklaas**  
*Students design experiments, analyse data, and write up results*

One of the core lab components of the unit is a plant competition experiment, run over a six-week period at the start of semester. As well as using the experiment to teach foundation concepts in Ecology, Raphael Didham and Erik Veneklaas have developed this component of the lab activities as a hands-on research exercise that enables students to learn how researchers develop a project from the initial hypothesis to final conclusions. In a small-group setting (4-6 students), the students formulate their own hypothesis about the influence of intraspecific vs interspecific competition among several plant species of their choice (though taking into account a set of project constraints on available species, resources, time, and so on). Following a "pre-lab" discussion on experimental design, students develop their own design for an experiment to test their hypothesis. Teaching staff evaluate the experiment design and provide feedback. Students are given the opportunity to respond to the critique and revise their hypothesis and/or experimental design accordingly before proceeding to carry out the experiment (sowing seeds in various combinations to test their hypothesis about competitive effects). Students harvest the plants after three weeks of growth, measure plant growth (and other parameters of their choice), and receive training on how to analyse the data in the R statistical package. Finally, the students write a scientific report on their findings.

**Third Year**

**PHYS3002 Electrodynamics and Relativity**  
**Coordinator: Darren Grasso**  
*Simulating the conference experience*

As part of the laboratory component, this unit has an assessment item entitled “the third year conference." This activity seeks to emulate as closely as possible a typical Physics conference where students can engage in standard methods of research communication. Over the course of the two-day "conference," students work in small groups of two or three to deliver a presentation on one of their third-year experiments. Students are also expected to submit a full journal-style article to “the third year conference proceedings," a printed and bound copy which is presented to each of the participants as a keepsake of their time during the Physics major. According to many student evaluations, the conference is one of the highlights of their last year at UWA.

**BIOL3360 Saving Endangered Species**  
**Coordinators: Barbara Cook and Stephen Hopper**  
*Assisting with the management of threatened species in WA*

Research is often an integral part of recovery plans, as scientists investigate important aspects of the ecology and biology of threatened species, or test the effectiveness of management actions. The results of these investigations are usually published in the form of a scientific report or paper. As part of the practical program on this unit in 2016, students
tested a hypothesis relevant to the relationship between wild fire, other threatening processes, and the vulnerable species, Banksia verticillata. In addition, students designed a fieldwork program and collected and analysed data on the impact of fire on Banksia verticillata. The data was used to prepare a scientific report suitable for publication in a scientific journal. Students wrote up their report in the form of a Short Communication for the journal *Biological Conservation*, and were asked to consult the journal’s instructions to authors for the precise format required in terms of word length (4,000 words), presentation of figures and tables, referencing, and general format. They were asked to look at a few Short Communications in the journal to familiarise themselves with approaches to scientific writing in succinct form. Data generated by students in the unit are given annually to Parks and Wildlife Service to assist with the management of threatened species in WA.

**PSYC3310 Specialist Research Topics**  
**Coordinator:** Nicholas Fay  
*Team teaching to introduce students to the latest research*

The School of Psychological Science at UWA is a research intensive school. In each round of the ERA to date, it was ranked 5/5 for its research in Psychological and Cognitive Science and 5/5 for Psychology. The School of Psychological Science is consistently ranked in the top 50 in the QS World University Ranking for Psychology (currently number 41). In PSYC3310, students experience the latest cutting-edge research in the classroom via active participation in a research project that falls within the area of expertise of a member of academic staff. In close collaboration with the academic, students (in a small class of no more than 20 students) 1) identify research questions, 2) develop awareness of ethical issues in psychological research, 3) design an experiment to answer the research question, 4) collaborate with others in a team, 5) analyse and interpret the data, 6) communicate the results both orally and in writing, and 7) give and receive feedback. These core research skills are crucial to the student as they advance into the honours research program and pursue postgraduate study. Working alongside a research-active academic, students become familiar with the latest research findings and methodologies, and design and execute an experiment that has the potential to contribute to knowledge creation. The unit typically includes 16 different topics (e.g., memory, behavioural economics, emotion recognition) led by 16 different academics. The topic chosen by the student will expose them to the area of expertise of a member of academic staff, including the range of research paradigms used by academics in that particular field.

**CHEM3002 Chemical Explorations**  
**Coordinator:** Matthew Piggott  
*Conducting research on real-world chemistry problems and learning to communicate to non-specialist audiences*

This unit is compulsory for all students taking a major in Chemistry, and has recently been highlighted by the Royal Australian Chemical Institute (RACI) as being an exemplary unit in their analysis of the UWA Chemistry degree. Through a number of structured inquiry-based learning approaches, this unit provides an introduction to the application of chemical skills to problems in the real world. Under the guidance of a staff member, students choose a research topic and write up a research proposal. The research proposal should be unique and the timeline should be one year. The categories of the proposal include aims and significance of the research, a research plan, methods and techniques, timeline, budget, and references. A second component of this unit is the Journal Club. This involves the students choosing a 2015–17 primary research article from a selection of good journals provided by academic staff. The students will then prepare and deliver a presentation lasting around seven minutes, followed by up to three minutes of questions. The primary aim of the presentation is to explain the science in the paper, keeping in mind the non-specialist audience. Students deliver their presentations individually to ensure they are fairly rewarded.
for their efforts. Each student is assessed by staff members and peers for clarity, chemistry, slides, presentation skills, timing, and answers to questions from the audience.

**ITAL3814 Sociolinguistics of Contemporary Italy**  
**Coordinator:** John Kinder  
**Conducting research on letters**

In this unit, students evaluate and apply concepts from contemporary Italian sociolinguistics by studying personal letters written by Italian migrants in WA. John Kinder has been working on epistolary correspondence for some years, and takes students through the process of locating, obtaining, and analysing one or more migrant letter. The class visits the National Archive of Australia in Victoria Park, and for the major assignment, each student is required to locate a letter from relatives, friends or from John's collection of letters, transcribe the letter, and conduct a linguistic analysis. Students also present their findings in a five-minute presentation to the class in order to help crystallise their ideas. Through this assignment, students gain experience of a range of issues to do with practical linguistic research: contacting participants in the community and gaining their confidence; collecting and storing data; and integrating analysis of the language data with the broader context of identity and diversity, at the personal and social levels. This is the first year that John has set this assignment for an undergraduate unit. In 2015, he supervised an Honours dissertation on similar material, and then co-authored an article with the student, which was published in 2016.

**Postgraduate**

**Co-operative Education for Enterprise Development (CEED)**  
**Director:** Jeremy Leggoe  
**Working with industry**

CEED is a formal program providing opportunities for students to work on industry-sponsored research projects. Project topics are defined by clients to address real issues in the clients' operations. CEED has existed since 1987 and in 2017 will complete 26 projects. At CEED, 20-30 students work on projects at any one time. Most students are from the Master of Professional Engineering. Others are Honours students (depending on the discipline, e.g., Mathematics or Computer Science) or Masters by Coursework thesis students, and occasionally BPhil (Hons) students. To enter the program, students undergo an interview process, and for a standard project each student receives $10,000 from the organisation. CEED enables students to apply their research skills and to translate research into benefits. Through the program, students receive real-world experience and are work-ready by being in a work environment for twelve months. Benefiting from the expertise of their industry mentor and university supervisor, students produce a dissertation and a report or a tool (e.g., software or test rig and manual). In addition, students present their research at the annual CEED seminar, to which alumni, industry members, and academic staff are invited. Peer-reviewed journal and conference papers are regularly generated.

**Scholarly Activity**  
**Doctor of Medicine (MD) program**  
**Teaching the next generation of medical doctors to be scholars**

Scholarly Activity is a hallmark of the UWA medical degree. It comprises 24 points or 12.5% of the MD program. Students choose from one of three streams, which becomes the focus of their Scholarly Activity undertaken in years two through four of the program: service, coursework, and research. The research stream familiarises MD students with all the aspects of establishing an evidence base for practice, from understanding the ethical considerations...
of research, through data collection and analysis, to writing scientific communications. Students are matched with a research team to work on a meaningful and useful project identified by the research team’s Principle Investigator. There are currently 264 second-year to fourth-year MD students engaged in research projects. Service learning requires students to translate evidence into practice, in support of not-for-profits around WA. Currently, 86 second-year to fourth-year MD students are engaged in service learning projects. Students in the coursework stream have the option of taking research-focused units in Population Health and the Masters of Health Professions Education. There are currently 59 second-year to fourth-year MD students engaged in coursework.

PHCY5609 Current Developments in Health, Nutrition and Biotechnology
PHCY5614 Pharmacy Research Project

Coordinators: Connie Locher (PHCY5609) Lee Yong Lim (PHCY5614)

Integrating units to consolidate research training

These two integrated units provide students with ample opportunity to immerse themselves in the research process. In semester one, PHCY5609 students are exposed to a range of online lectures and complementary tutorials on the various stages of the research process before being assigned a research project either in the area of pharmaceutical sciences or pharmacy practice. Students carry out an in-depth literature review on their assigned projects, including a critical appraisal of the relevant published material, and report their findings in a detailed written literature review as well as a poster presentation. Following this, they meet with their supervisors to articulate a research hypothesis and explore an appropriate methodology for conducting their research project in semester two. In semester two, PHCY5614 students carry out their research either in research laboratories or at practice sites, e.g., community pharmacies, hospitals, and nursing homes. Progress is monitored at weekly meetings where students learn to work collaboratively with other members of the research team to critically examine and defend their research. The data collected are scientifically presented, discussed, and assessed in a written research dissertation and orally defended in a research seminar attended by academic staff, peers, and other stakeholders. Many of these research projects have been conceptualised in close collaboration with clinical practitioners (medical and pharmacy) and/or the pharmaceutical industry, and thus focus on real world challenges (e.g., medicine formulation problems, stability issues, communication barriers, prescribing problems, health economics). Research findings are reported back to these stakeholders. Therefore these research projects, which are often co-supervised by hospital or industry staff, facilitate close collaboration and promote UWA Pharmacy among the wider pharmacy community. Students also profit from the networking opportunities and appreciate that their work has the potential to create real impact in a clinical setting. Some of the best research has been published as peer-reviewed journal articles or presented at academic conferences.

Laws5509/5510 Advanced Legal Research

Coordinator: Sarah Murray

Advancing the process of law reform

One of the Law School’s main objectives is to maintain and promote quality in legal research by staff and students in order to facilitate and advance knowledge in law and the administration of justice. The School’s Advanced Legal Research program aims to foster research and writing skills among the most accomplished final-year JD students. The unit is offered by invitation, based on academic merit in the JD. The unit serves as a pathway to graduate studies, especially higher degrees by research. The unit is conducted over two semesters. Students undergo research training through compulsory guided seminars and academic staff supervision. They also submit a 2,000-word research proposal and a 10,000-word research paper. With their research, students are required to not only augment the store of knowledge and learning about law, but also advance the process of law reform.
Research Papers are part of the Law School’s publically available research. Once the Research Papers have been examined and passed, they are bound and retained in the Beasley Law Library. An important objective of the Law School is to increase the number of research papers suitable for publication as peer-reviewed research. Students are therefore encouraged to publish all or parts of their research papers as evidence of their outstanding research capabilities.

**EDUC5509 Interventions for Learning**

*Coordinator: Christine Howitt*

*Scaffolding the research process for students*

Within the Master of Teaching, it is an accreditation requirement that students learn about the research process. EDUC5509 helps satisfy this requirement. In this unit, students learn about action research in the classroom. Action research (or classroom-based research) is a continual process of gathering and interpreting data, critically reflecting on and reviewing actions undertaken, and planning future actions as a means to improve student learning and teacher practice. Introducing students to action research promotes independent research and inquiry, as teachers systematically improve their own professional practice. The unit includes a ten-day professional practice placement that has a strong action-reflective practice and research-informed dimension. Workshops scaffold students through the research process and include the topics, “What is research?,” “The research process,” “Introduction to approaches to research paradigms,” “What is action research?,” “How to conduct action research,” “Reviewing and critiquing the literature,” “Ethics and educational research,” “Writing a research proposal,” “Planning the intervention,” “Analysing data and reporting findings,” “Writing your report,” and “Writing the report for parents.” Students produce and present a project proposal; address ethical requirements and responsibilities; develop an evidence-based ten-day plan of action for an individual or small group of early childhood, primary or secondary children to improve learning; implement and evaluate the intervention in a selected curriculum area; produce a final report as a journal article; and communicate the results to parents in an appropriate manner.

**Community Engagement and Innovation**

It would be remiss to not include the less obvious ways by which students’ skills are employed and enhanced, especially in the areas of community engagement, entrepreneurship, and innovation. The question might be asked, do endeavours in these areas fit within our proposed approaches to research-led teaching?

Many students are genuinely excited by the possibility of applying their knowledge, research, and analytical skills to help others and to tackle real-world problems. As we have seen in case studies from around the world, universities have acknowledged students’ desire to make a difference by hosting real-world research and innovation challenges. UWA students are afforded opportunities to engage with community-based problems both within and outside the curriculum and to also participate in team challenges.

In SCIE3304 Field Techniques in Marine Science, projects are chosen in consultation with industry and staff from the UWA Albany campus that reflect the needs of the Albany community. Recent projects have attracted industry funding and they have included: student research into the distribution and abundance of invasive species in Princess Royal Harbour, the distribution of plastic debris on south-coast beaches and its relationship to offshore currents, and the contamination from suburban and agricultural run-off on mussel and oyster farms.
In PUBH2211 Population Health Field Trip, students further develop their public health knowledge and practice by addressing health issues in a developing country (Nepal or India) or in rural Australia. The unit is tailored to the area visited and may involve working with a local non-government organisation (NGO) on a health issue identified by the NGO as a priority, or by undertaking a series of site visits. Students interact with local community members, local health professionals, and community groups. They collect data from their field location to inform the development of potential interventions in the community, and may use the information in a report for the NGO.

Service Learning

PUBH2211 is recognised by UWA as a service learning unit. Other units looked at in the UWA case studies also fall within this category: BIOL1131 Plant and Animal Biology and BIOL3360 Saving Endangered Species are also service learning units. Service learning refers specifically to community engagement activities that are embedded in UWA units and are structured and assessed as formal educational experiences. Faculties implement service learning in coursework through a number of ways. It might be a required option: the School of Indigenous Studies requires students to collaborate with communities in a way that promotes shared learning. It might be through multiple course programs: the Doctor of Medicine (MD) program, which, as we have seen, has a strong research component, allows students to work with a not-for-profit organisation over a two year period. It might be an internship: UWA’s McCusker Centre for Citizenship, in partnership with a community-based organisation, gives students applied experience of the contexts and strategies associated with such fields as social justice, human rights, community development, capacity building, advocacy, environmental conservation or the provision of care (e.g., SVLG1002 McCusker Centre for Citizenship Internship; SVLG5001 McCusker Centre for Citizenship Internship).

Entrepreneurship and Thinking “Outside the Box”

UWA provides other opportunities for students to apply and enhance their ability to think creatively, innovatively, and “outside the box” – skills that research-led teaching is aimed at improving. Another service learning unit that focuses on entrepreneurship and innovation in relation to some of the major social challenges is BUSN1102 Changing the World: Social Innovation, Finance and Enterprise. This unit highlights how innovation and entrepreneurship can help solve major global social and economic challenges such as hunger, poverty, homelessness, and intergenerational disadvantage. Students explore tools for social change in a digital and social media world (e.g. Kiva, Kickstarter, Twitter, Facebook) and examine trends in the measurement and demonstration of social impact. The unit includes a group project conducted with the national Big Idea student competition. Groups develop their concept of a social enterprise to meet social issues, come up with a business plan, and then pitch their plan. Workshops are held to coach students in the lead up to the competition.

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5 The Big Idea is a social enterprise competition, in which university student teams from around Australia work on their “big idea” for improving the lives of disadvantaged Australians. Students participating in The Big Idea develop a concept and business plan for a social enterprise or social business. It is a national competition delivered by The Big Issue, and UWA is one of the 13 university partners. Students participate through the unit BUSN1102 Changing the World: Social Innovation, Finance & Enterprise or as an extra-curricular activity. At The Big Idea UWA final on 25 October 2017, five teams of undergraduate UWA students will pitch to an expert judging panel. The winner of this event will go through to compete at the national finals.
The unit is coordinated by the Director of the Business School's Centre for Social Impact UWA, which also hosts the Social Impact Festival, an opportunity for students to network and hear the latest research on initiatives bringing about positive social change.

UWA’s Innovation Quarter (IQ) provides another gateway to entrepreneurship and innovation. IQ promotes a culture of innovation, entrepreneurship, and team work. The team facilitates industry engagement in order to enhance education and research impact. IQ brings researchers and students together for mutually beneficial relationships. For example, the team connects researchers with innovative students to support a research or teaching project.

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6 The Centre for Social Impact UWA is part of a national collaboration with UNSW and Swinburne University of Technology. Together, the three universities form the Centre for Social Impact, which takes a systems approach to developing innovative solutions to the biggest social challenges.
## Appendix D

A complete list of submissions on research-led teaching units and programs from faculties, schools, and individuals.

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