# Teaching Leadership Skills to Medical Students:

# Are We Transformative?

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# Statement of the Contribution of Others

## Contributions of Others

The contribution of others is outlined in the table below. The table identifies the extent and nature of the collaboration with individuals throughout the research process.

| Nature of assistance | Contribution | Names, titles, and affiliation of co-contributors |
|---|---|---|
| Intellectual support | Supervision | Primary Supervisor: Professor Tarun Sen Gupta<br>Secondary Supervisor: Associate Professor Peter Joseph Johnson. |
| | Study design and ethics | My supervisory panel above guided and supported the design of every survey and interview guide. They also guided the writing of my human ethics application and every amendment submitted.<br>A/Prof Robin Ray, retired Associate Dean Research Education, also guided the mixed methods study design and original ethics response. |
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# Presentations and Publications in Support of This Thesis

## Presentations

1. Presentation at the JCU Cohort Program Feb 2016. "Teaching Leadership Skills to Medical Students"
2. Confirmation Seminar at JCU on 2 February 2017
3. Presentation at JCU Cohort Program Feb 2018. "Using Excel for Content Analysis: Filters and Pivot Charts"
4. Presentation at ANZAHPE Conference 2019. "(Preliminary) Outcomes of a National Medical Leadership Curricula Assessment and Evaluation Survey"
5. Personally Arranged Learning Session (PeArLS) at ANZAHPE Conference 2019. "Let's Develop a Nationally Accepted Medical Leadership Curricula"
6. Pre-Completion Seminar at JCU on 18 April 2023
7. Presentation at ANZAHPE Conference 2023. "ANZAHPE LEAPS into action … Development: Medical Student Leadership Framework"
8. Presentation at ANZAHPE Conference 2023. "ANZAHPE LEAPS into action … Discussion: Medical Student Leadership Framework"

## Publications

**Ross S**, Sen Gupta T, and Johnson P. Leadership skills for medical student clubs and societies. *Med Educ*. 2018;52(11):1182-1183. DOI:10.1111/medu.13727.

**Ross SJ**, Sen Gupta T, and Johnson P. Why we need to teach leadership skills to medical students: a call to action. *BMJ Leader*. 2019;3(1):6-10. DOI:10.1136/leader-2018-0001.

**Ross SJ,** Sen Gupta T, and Johnson P. Leadership curricula and assessment in Australian and New Zealand medical schools. *BMC Med Educ*. 2021;21:28. doi.org/10.1186/s12909-020-02456-z.

## Other Publications Published During This PhD Candidature

I have the opportunity to contribute to research and present at conferences as an academic at the College of Medicine and Dentistry, James Cook University. Below is a list of written works conducted while being enrolled in this PhD. My research portfolio can be found here.

**Articles**

Larkins S, Michelsen K, Iputo J, et al. Impact of selection strategies on representation of underserved populations and intention to practise: International findings. *Med Educ*. 2015;49(1):60-72. DOI:10.1111/medu.12518.

Siega-Sur JL, Woolley T, **Ross SJ,** Reeve C, Neusy A-J. The impact of socially-accountable, community-engaged medical education on graduates in the Central Philippines: implications for the global rural medical workforce. *Med Teach*, 2017;39(10):1084-1091. DOI:10.1080/0142159X.2017.1354126.

Reeve C, Woolley T, **Ross SJ**, et al. The impact of socially-accountable health professional education: a systematic review of the literature. *Med Teach*. 2017;39(1):67-73. DOI:10.1080/0142159X.2016.1231914.

Halili S Jr., Cristobal F, Woolley T, **Ross SJ.**, Reeve C, and Neusy A-J. Addressing health workforce inequities in the Mindanao regions of the Philippines: tracer study of graduates from a socially-accountable, community-engaged medical school and graduates from a conventional medical school. *Med Teach.* 2017;39(8):859-865. DOI:10.1080/0142159X.2017.1331035.

Clithero A, **Ross SJ**, Middleton L, Reeve C, and Neusy A-J. Improving community health using an outcome-oriented CQI approach to community-engaged health professions education. *Front Public Health*. 2017;5:1-6. DOI:10.3389/fpubh.2017.00026.

Woolley T, Halili S Jr., Siega-Sur J-L, et al. Socially accountable medical education strengthens community health services. *Med Educ*. 2018;52(4):391-403. DOI:10.1111/medu.13489.

Woolley T, Cristobal F, Siega-Sur J, et al. Positive implications from socially accountable community-engaged medical education across two Philippines regions. *Rural Remote Health*, 2018;18(1):4264. DOI:10.22605/RRH4264.

Malau-Aduli BS., **Ross S**, and Adu MD. Perceptions of intercultural competence and institutional intercultural inclusiveness among first year medical students: a 4-year study. *BMC Med Educ*. 2019;19:346. DOI:10.1186/s12909-019-1780-y.

**Ross SJ.**, Owens K, Roberts A, Jennings E, and Mylrea M. Mindfulness training: success in reducing first year health professional students' study and exam related stress. *Health Prof Educ*. 2020;6(2):162-169. DOI:10.1016/j.hpe.2020.04.001.

Woolley T, **Ross S**, Larkins S, Sen Gupta T, Whaleboat D. "We learnt it, then we lived it": influencing medical students' intentions toward rural practice and generalist careers via a socially-accountable curriculum. *Med Teach*. 2021;43(1):93-100. DOI:10.1080/0142159X.2020.1817879

Malau-Aduli B, Adu M, Alele F, et al. Adjusting to university: perceptions of first-year health professions students. *PLoS One*, 2021;16(5):e0251634. DOI:10.1371/journal.pone.0251634

Guignona M, Halili S, Cristobal F, et al. A curriculum for achieving universal health care: a case study of Ateneo de Zamboanga University School of Medicine. *Front Public Health*. 2021;9. Article:612035. DOI:10.3389/fpubh.2021.612035

**Book Chapters**

Larkins S, Murray R, Sen Gupta T, **Ross S**, Preston R. Case study 1.2: James Cook University School of Medicine, Australia. In: Bin Abdulrahman, Khalid A., Mennin, Stewart, Harden, Ronald M.,

and Kennedy, Catherine, (eds.) *Routledge International Handbook of Medical Education*. Taylor & Francis; 2016:5-7.

Cobb N, Clithero A, Cristobal F, Fisher J, Larkins S, Middleton L, Neusy A-J, Preston R, **Ross SJ**, Strasser R, and Woolley T. Nurturing social accountability and community engagement. In: Kayingo, Gerald, and McCoy Hass, Virginia, (eds.) *The Health Professions Educator: A Practical Guide for New and Established Faculty*. Springer; 2018:407-416.

Kokavec A, Harte J, **Ross S.** Student Support in Medical Education: What does evidence-based practice look like? In: *Mental Health and Higher Education in Australia*. Springer; 2022:103-121.

Hogenbirk J, Woolley T, **Ross S**, Moody-Corbett P, Larkins S, Cristobal F, Siega-Sur JL, Guingona M, Fisher J, Johnston K, Pálsdóttir B. Chapter 4: Where do graduates go? Developing a graduate tracking system: the experience of THEnet. In: *Strengthening the Collection Analysis and Use of Health Workforce Data and Information: A WHO Handbook*. 2023:53-79. Accessed 7 April, 2023. http://www.who.int/publications/i/item/9789240058712

## Abstract

Health system reform models since the early 1990s have recommended leadership training for medical students, graduates and health workers. While there is a small amount of literature published in this area, there are clear gaps in the research evidence of how to teach and assess medical leadership, particularly involving formal evaluation of teaching and leadership in medical schools. This research is the first in-depth multi-level study into medical leadership teaching and assessment across the medical leadership training continuum in Australia. This project aimed to:

1. Review the current medical leadership frameworks and curricula available domestically and globally, and adapt them to the Australian undergraduate medical education programs and the health system, where appropriate,
2. Critically evaluate the leadership skills that are currently taught and assessed across the 22 Australasian medical schools,
3. Critically evaluate current leadership roles, training, and experiences across the medical education continuum as informed by medical student executives, graduates, and specialist leadership trainers,
4. Determine the leadership training needs for the best practice in the Australian health system as informed by academic leads and/or College Deans, medical student executives, graduates, and specialist leadership trainers, and
5. Develop and validate a medical student leadership framework and tools to suit medical leadership education and assessment at the medical school level.

The theoretical paradigms used in this study were transformative education and transformational leadership. The empirical and grey medical leadership literature and frameworks nationally and internationally were reviewed using an integrative review format, with an underlying pragmatic research methodology. This thesis involved a mixed methods multiphase study design. Data collection and analysis occurred in each of the three studies (phases), with the findings of each phase informing the next. The participant groups and methods of data collection included:

1. A survey of academics/Deans in Australasian medical schools (*n* =16),
2. Interviews with the Australian Medical Student Association executives (*n* = 4),
3. A focus group with Queensland Rural Generalist Pathway executives (*n* = 5), and
4. A survey of JCU medical graduates in postgraduate years 4+ (*n* = 204).

Analysis of the quantitative surveys included chi-squared test for trend, Student's t-test, descriptive analysis, and ordinal analysis. Conventional content analysis was used for the qualitative interviews and focus groups.

The integrative review findings identified no national medical leadership strategies, resources and / or teaching strategies in Australia. The findings also identified that an Australian medical leadership framework requires a focus on evidence-based practice for patient care and safety for training, with many preferred teaching method options. These include in the curricula or on placement, or extra-curricular (e.g., via student clubs). Phase 1 evaluated the self-identified *current* leadership teaching and assessment in Australasian medical schools, and the *proposed* leadership training across the Australian medical education continuum. The findings show the *current* teaching occurs using various methods and is ad hoc. More than half the Australasian medical schools assess and less than half evaluate leadership training. Three key barriers include: 1) a lack of knowledge and expertise in how to teach and assess leadership, 2) a lack of national curricula and guidelines for teaching and assessment, and 3) lack of evaluation of the leadership training.

Phase 2 was a mixed methods study of stakeholder perspectives on *current* and *proposed* leadership training and assessment across the Australian medical education continuum. Participants included JCU medical graduates, Australian Medical Student Association executives, and Queensland Rural Generalist Pathway Executives. Key quantitative results of the JCU medical graduates found that almost half of graduates self-identified as never working in a medical leadership role, almost a sixth of graduates self-identified they had no formal leadership training, and less than half of graduates complete formal leadership training at their specialist College. However, for the findings of qualitative content analysis of all three participant groups, there was clear cause and effect of role-models (leaders) inspiring personal and professional values, skills, and knowledge to peers with

resultant positive behaviour change. Further, the findings outlined key barriers such as workforce time commitments, clinician's time commitments, lack of access to leadership training, relevance of training to current practice, expense, leadership teachers' skills set, and relevance of teaching to real world practice.

The data of the *proposed* leadership teaching across the Australian medical education continuum from Phase 1 and 2 was analysed in Phase 3. From these findings, along with the recommendations of the integrative review and Phases 1 and 2, a Medical Student Leadership framework (*MedStudentLead* framework) was designed for medical schools (and students) in Australia. The draft *MedStudentLead* framework and methodology was presented at a national conference. Feedback was collected for validity and usability from six medical education academics, each Academic from a different Australian medical school across three states. Feedback was also collected from the Australian Medical Student Association for the student usability perspective.

Based on the findings outlined above, several recommendations were proposed. The integrative review identified recommendations for national training, curricula, evaluation, learning outcomes and research agendas. Phase 1 identified recommendations for a health leadership core curriculum, and teaching methods with a work integrated focus. Phase 2 identified recommendations at each stage of training (medical school, junior doctor, senior clinician, and specialist) across the continuum. Plus, recommendations for transformational leadership training for teachers and role-models. Phase 3 developed an Australian *MedStudentLead* framework focused on medical students building: 1) own emotional and learning agility, 2) relationships with colleagues and patients, and 3) a culture of respectful learning and clinical curiosity.

The breadth of the participant groups and the medical leadership findings cross the medical education continuum from medical school to specialist. Therefore, the findings of this multiphase study are relevant for the Australian Medical Council and other accrediting bodies, academics and Deans of medical schools, clinical educators, medical students, medical doctors, specialty training organisations, and the public (patients, carers, and family).

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# Glossary

**AHPRA**: Australian Health Practitioner Regulation Agency. AHPRA administers the National Registration and Accreditation Scheme

**AMSA**: Australian Medical Student Association

**ANZAHPE**: Australian and New Zealand Association for Health Professional Educators

**Australian Medical Council (AMC)**: The Australian Medical Council is the accreditation authority for the medical profession under the National Law. In the process for recognition of new or amended specialties, the Australian Medical Council has an advisory role to the Medical Board of Australia

**Basic medicine education program**: See medical school below.

**Clinician**: A medical graduate whose key role includes general practitioner, specialist, hospital non-specialist, and/or specialist in training

**Commonwealth supported places**: A place at a university or higher education provider where the government plays part of the fees

**End-User Feedback:** An end user is a person who ultimately uses or intends to use a product. Feedback collected directly from end users provides insight in how they interact with the content and their overall experience

**Graduate entry degree:** A university tertiary degree where the entry requirement is to have already completed and hold a tertiary university degree qualification

**HWA**: Health Workforce Australia

**Intern**: Registered practitioner in the first year of practice following graduation as a doctor. Can also be referred to as PGY1.

**JCU**: James Cook University:

**MBBS**: Bachelor of Medicine, Bachelor of Surgery

**Medical education continuum**: The continuous sequence of gradual education from medical student to junior doctors and senior clinicians

**Medical educator**: Those from both medical and non-medical backgrounds that teach in a medical school or in a clinical setting and are crucial for the training of medical students, junior doctors and in continuing professional development

**Medical program or school**: An organisation that is accredited to provide approved programs of study that lead to registration as a medical practitioner. Often called a medical education provider or medical professional entry degree. In Australia, this could take four to six years depending on whether direct entry or graduate entry

**Medical student**: A student enrolled in a medical school for four to six years depending on whether direct entry or graduate entry

**MedStudentLead framework**: Medical Student Leadership framework

**Medical Board of Australia or Medical Board**: The Medical Board of Australia regulates medical practitioners in the public interest

**National Law**: The Health Practitioner Regulation National Law, as in force in each state and territory

**PGY2-6**: A registered practitioner in their second to sixth year or more of practice following graduation as a doctor. For example, PGY4+ is a registered practitioner with four years or more of practice.

**QRGP**: Queensland Rural Generalist Pathway

**RACMA**: Royal Australasian College of Medical Administrators

**Specialist medical college**: an organisation whose program of study has been accredited by the Board's accreditation authority, the Australian Medical Council, and whose resultant qualification has been approved by the Board as providing a qualification for the purpose of specialist registration

**Specialist trainees**: registered medical practitioners undertaking an education and training program in an Australian Medical Council accredited specialist college that will lead to being eligible for fellowship and specialist registration

**Specialty**: means any of the recognised medical specialties, fields of specialty practice and related specialist titles that have been approved by the COAG Health Council pursuant to the Health Practitioner Regulation National Law, and is force in each state and territory

**THEnet:** Training for Health Equity Network

**Undergraduate Entry Degree**: A university tertiary degree where the entry requirement is to have completed and hold a secondary school qualification

**WHO**: World Health Organization

# Chapter 1. Introduction

In recent years, the importance of medical students' leadership skills has been increasingly recognised by medical educators, academics, and professionals. Medical programs have begun to focus on leadership skills training across the medical education continuum from medical students to junior doctors and senior clinicians.[1-3,16] In 2012, the Australian Medical Council (AMC) updated their graduate outcome statements for use from 2013.[4] For the first time, it included a domain on Professionalism and Leadership: the medical graduate as a professional and learner.[1] As the AMC is the accrediting organisation for medical programs in Australia, it is expected that each medical student graduate will have a foundation level of leadership skills to practise under supervision as an intern. One year into the release of AMC's medical leadership teaching requirements, Webb[5] (2014) noted that many medical schools are not expected to teach leadership, or if it is taught, the leadership curricula are developed without measurable leadership competencies. Sebastian et al.[6] also noted that clinicians in a leadership role but without leadership training may be operating outside their scope of practice, given that medical leaders positively drive innovation, staff morale, and patient quality care.

Currently, the available medical leadership literature for Australasia shows a lack of appropriate concepts, teaching competencies, and behaviours related to leadership skills for medical students, medical trainees, and clinicians.[7-11] There is also a paucity of research on the subject of teaching and assessment of leadership skills training.[3,5,6,12,13] Therefore, this study aimed to review Australian medical leadership training and assessment in context while recognising the complex training needs and study or work environments of medical students through to senior clinicians. Further, this study reviewed both the learners' needs and the medical leader skills training required for every level of the medical education continuum. The overarching aim of this research is to address gaps in the medical leadership skills training literature, and to develop a practical framework for delivering, assessing, and evaluating the required medical student training, skills, and behaviours.

[1] The *Standards for Assessment and Accreditation of Primary Medical Programs by the Australian Medical Council 2012* were updated late in 2023 for use in 2024. This update was after the data collection of this research (end of 2020). The Professionalism and Leadership domain has been expanded and includes a few more aspects of leadership competencies and now highlights followership.

### 1.1. Personal and Professional Interest in Research Area

I have spent much time as a patient in various medical settings. This experience provided an external view of hierarchy and leadership within health teams. While viewing these health teams from my position as a patient, I regularly saw cracks. It greatly disturbed me when I watched in-house fighting resulting in members of the health team not focusing on me, their patient. On reflection, I was concerned about the quality of treatment I might receive. However, after leaving the medical setting it often rolled off my shoulders, as one patient cannot change a healthcare systemic issue.

I am now working as an academic in medical education and completing a PhD in my late 40s. As a medical educator, I regularly hear medical students discuss the lack of leadership skills training they receive, and their concern about the societal and health system expectations for them to become healthcare team leaders and community leaders. This same discussion is also heard when speaking with clinicians about leadership training at the junior doctor and senior clinician levels.

The medical school I work for (James Cook University [JCU]) is a socially accountable school[14] with educators who have a balance of medical, allied health, biomedical, and social science backgrounds.[15] I have never been a medical student nor will ever be a medical doctor; however, I am privileged to work as a social science and medical education academic and to hear our medical students' concerns for their future. Our medical school is a founder of the Training for Health Equity Network (THEnet),[16] and as an academic researcher contracted to THEnet for seven years, I have both researched and taught the philosophy of improving health equity and outcomes in the community. The social accountability demand for reforming health systems[17,18] has highlighted the need for students to be trained in the complexity of the health system, and to be able to work in all school reference communities.[19-22] Thus, medical students are required to know and understand the health needs of their community. This importantly highlights that students require knowledge of how to reform a system with other actors or agents when they become clinicians. Students therefore require knowledge and skills to become health system change agents for best practice patient care, and to observe leadership values that are seen in action. As future leaders, they require leadership training addressing how to work well with others—not just in their healthcare team, but also within local businesses and government.

In this section, I have reflected on my own personal and professional history and considered how my worldview might impact this study. I have not held a naïve view that leadership skills training will fix all; however, my experience and formal education have informed my belief that leadership training with on-the-job practice can dampen most conflict caused by miscommunication and structural causes—the type of conflict caused by decision-making processes and how an organisation is set up. Due to this perspective, I have been careful about design and analysis biases, with surveys and interview guides created using validated measures rather than measures based on my personal values. The quality and rigour of results were independently reviewed by my supervisors, the participants, and expert medical educators. Further, I have been careful to ensure there is no coercion and that I do not teach or assess any of the participants.

## 1.2. Research Aims and Significance of This Study

### *1.2.1. Research Aims*

I commenced this study with the goal of investigating the current medical leadership empirical and grey literature of both national and international significance (Chapter 2). While there was a small amount of literature published in this area, there are clear gaps in research regarding how to teach and assess medical leadership. These gaps particularly involve formal evaluation of teaching leadership in medical schools. However, the main aim was to review leadership frameworks already in use to adapt them to the Australian context for teaching and assessing leadership in medical education.

I then set out to examine the current leadership skills *taught* and assessed in the Australasian medical schools to determine the current state of medical leadership education for students (Phase 1, Chapter 4). At the same time, participants also identified proposed leadership skills that *should be taught* across the Australian medical education continuum. This provided a baseline of the types of leadership training and assessment to be provided to medical students, junior doctors, and senior clinicians.

Using a mixed methods study, I then examined a multi-stakeholder perspective of *taught* and *should be taught* leadership training and assessment across the medical education continuum. This

examination identified leadership training needs for best practice in the current Australian health system (Phase 2, Chapter 5). Using the data collected in the first two phases, the final phase of this study was designed to develop and validate a medical leadership framework for medical students (Phase 3, Chapter 6).

The five aims of this research were:

1. Review the current medical leadership frameworks and curricula available domestically and globally, then adapt them to suit Australian undergraduate medical education programs and the health system, where appropriate.
2. Critically evaluate the current leadership teaching and assessment skills across the 22 Australasian medical schools.
3. Critically evaluate current leadership opportunities, training, and experiences across the medical education continuum as informed by medical student executives, graduates, and specialist leadership trainers.
4. Determine the leadership training needs for best practice in the Australian health system, as informed by academic leads and/or college deans, medical student executives, graduates, and specialist leadership trainers.
5. Develop and validate a medical student leadership framework and teaching and assessment tools to suit medical leadership education and assessment at the medical school level.

### *1.2.2. Significance of This Study*

This research is the first in-depth, multi-level study on medical leadership teaching and assessment across the medical education continuum in Australia. The research findings are relevant for the AMC,[4] medical educators, clinical educators, academics, students, and the public. Research outcomes have been published in international journals,[23,24] with the potential for any medical school and medical specialty trainer to adapt the leadership teaching and assessment to their training context. A major outcome of this study, the Medical Student Leadership framework (*MedStudentLead* framework), is published on its own website (www.medstudentlead.com.au) for ease of access for medical students,

academics, policy makers, and specialist college teachers and executives. This framework is the first of its kind in Australia. A draft of this framework and methodology was presented at a national health professional educators conference. Feedback was collected for validity and usability from six medical education academics—each from a different Australian medical school across three states.

### 1.3. Overview of Leadership and Educational Theory

The below sections outline the decisions made for this study regarding the leadership and education theoretical paradigms used (Sections 1.3.1 and 1.3.2).

Three leadership theories were reviewed (Chapter 2), and the *transformational leadership* style was selected for its successful use in healthcare.[25-29] As this is also a medical education study, education paradigms relevant to the health field and transferrable to the topic of teaching leadership skills were also reviewed. The *transformative education* paradigm was selected and discussed (Chapter 2), as it promotes student learning and personal growth to create change agents.[30-35] Below is an overview of each theory for the purpose of this study.

#### *1.3.1. Transformational Leadership*

Transformational leadership was conceptualised by Bass and Avolio.[36-38] This leadership style was designed to move away from the *transactional style* of leadership focusing on contingent reward through leader–subordinate relations, to a *transformational style* with leaders who actively improve morale and organisational commitment and loyalty. Transformational leadership behaviours are described by Avolio, Walumbwa, and Weber in 2009 as "behaviours that transform and inspire followers to perform beyond expectations while transcending self-interest for the good of the organisation."[39(p423)] As transformational leaders are considered moral leaders; they work towards the benefit of the team and organisation with high expectations of themselves and others.[40]

Further, Bass emphasised that transformational leadership motivates others to do more than originally expected, with "more effort, creativity, and productivity in the long run. "[36(p.30)] This occurs first by raising the value of an outcome; second, by transcending self-interest as a leader for the sake of others; and third, by transforming or expanding others' personal needs and desires in the workplace.[36]

To focus on the third point, a transformational leader who inspires others is doing so for the good of staff and also the organisation. The leader is action oriented, regards ethical and moral values, and focuses staff on identifying and solving problems. For example, the leader shows how to intellectually find new ways to look at old problems rather than see them as difficulties. This not only motivates staff but allows transformative leaders to guide staff through the opportunities and threats facing their organisation while shaping their work environment for the better.[41]

Four core components of transformational theory were published by Bass in 2006,[42] to define the characteristics of a transformational leader. These are:

1. **Idealised influence**: Role modelling where the leader showcases and displays the goals and actions (walking the talk) while inspiring other staff to do the same.
2. **Inspirational motivation**: The leader shows a positive level of enthusiasm and optimism that motivates, inspires, and encourages staff.
3. **Intellectual stimulation**: The leader fosters an open and positive environment, and provides opportunities for staff to feel stimulated, challenged, and empowered.
4. **Individual attention**: The leader genuinely guides each staff member and provides support and empathy based on individual necessity.

The first two components above can be grouped together as 'charisma.' However, the intent of transformational leadership is on the team and their shared goals whereas, in charismatic leadership, it is focused on the leader and their own goals.[43]

As with most evolving theories, there have been some criticisms. The first criticism relates to the lack of conceptual clarity, process, and behaviours required by the leader to transform others.[44-46] The second criticism argues there is too much influence on a 'heroic' leader with no guarantee of ethical or moral fibre.[47] Bass addressed this concern by arguing that leaders who are not ethically or morally sound are *pseudo-transformational leaders* who are self-serving, and as a result, different to a transformative leader.[48] The third criticism is that transformational leadership does not consider the context of each situation and assumes the principles apply to all, without considering the competency,

role, motivation, and culture of its followers.[43,49,50] The fourth and final criticism is the risk of high emotional involvement and, thus, burnout.[51]

Within the last two decades, there has been a focus on transformational leadership in the medical clinical setting due to the practical- and people-oriented framework that ultimately benefits healthcare at the bedside.[33-35,43,52-55] In 2016, Spinelli studied three leadership styles with hospital administrators in the United States, via subordinate managers' ratings on their willingness to exert extra effort as a follower, their perception of the leader's effectiveness, and their satisfaction with their leader.[56] The findings showed "the more the subordinate manager perceived the leader as exhibiting transformation behaviours, the greater he or she reported exerting extra effort, expressed satisfaction with the leader and believed the leader to be more effective."[56(p.13)] Whereas Hammer et al.'s 2012 study of German hospital directors showed a 36% increase in the quality of social relationships between staff, with the presence of shared rules and values when the hospital executive management used a transformational leadership style.[57] Lastly, Lo, McKimm and Till stated in 2018 that the transformational leadership model underpins the United Kingdom (UK) *Clinical Leadership Competencies Framework* (CLCF).[43] Its previous iteration is known as the *Medical Leadership Competency Framework* (MLCF).[1] The CLCF is currently the only leadership framework designed for clinicians at all stages of their professional training and includes medical students. In Australia, Bond and Chong evaluated the Rural Generalist Leadership for Clinicians Training Program[58] and found that early indications of transformational leadership in their graduates are due to leadership knowledge acquisition and positive behavioural change resulting in organisational change. The discipline of nursing has conducted an extensive amount of research focused on transformational leadership. Much of this nursing research has focused on improving patient quality of care,[59,60] developing potential and current nurse leaders,[31,61-64] and predicting nurses' job satisfaction.[30,65]

As the transformational leadership theory is still evolving, recent citations have argued not to abandon transformational leadership, but to instead address its shortcomings.[43,66] It is expected that transformational leadership will be expanded and linked to the health system for some time to come.

### *1.3.2. Transformative Education Paradigm*

The overall purpose of the transformative education paradigm is to promote student learning and personal growth to create change agents who will improve societal structures. Transformative education is known by many terms, such as *transformative learning*[67] and *transformational teaching*.[68] This teaching paradigm has contemporary approaches to learning and classroom instruction, with the two highest forms of transformative teaching seen as active and student-centred learning.

For transformative education to occur, the teacher requires a dynamic relationship with the students. Much like the transformational leadership style, the teacher is required to be engaging and trusted, and have a good grasp of the educational theoretical underpinnings. Group work is highly recommended for students to construct a shared body of knowledge and an ability to collaborate with each other about their learning, whilst also challenging and encouraging each other.[68] In medical education, key transformative learning principles include patient equity, community equity, and social justice and advocacy, with education practices including critical reflection, open dialogue, and storytelling (see Section 1.3.2.1 for more information on critical reflection).[69] The topic, 'create change agents' is quite complex and includes challenging students' mental models of learning (see Section 1.3.2.2).

**1.3.2.1. Critical Inquiry.** A medical education practice typically seen within transformational education is critical reflection. Ng, Kinsella, Friesen and Hodges' non-systematic critical narrative states "critical reflection falls under the pluralistic umbrella of reflection but requires more explicit attention to social and systemic forces, and the assumptions embedded in thought processes and power relations, with an aim toward transformation and action."[70(p465)] Thus, critical reflection can often be seen instead as a form of *critical inquiry*.[71] In educational practice, critical inquiry is a reflective thought process that occurs "as an outcome of 'real-time' or asynchronous discourse that learners engage in when involved in problem-solving activities."[72] Whereas critical reflection or reflective practice[73] is most commonly taught in education via portfolios of reflective writing.

With critical inquiry as the education practice, the pedagogy is student centred, problem oriented, and has experiential learning opportunities. A critical inquiry curriculum has a multi-

disciplinary evidence base for students to be able to appraise the cultural, social, scientific, and political factors of patient and community health. These factors are linked strongly with health equity and social justice. Leahy states that, with critical inquiry, students can explore topics such as "inclusiveness, power inequalities, taken-for-granted assumptions, diversity and social justice to develop and implement strategies to improve their own and others' health, wellbeing and physical activity opportunities.''[74(p.179)] Further, critical inquiry-based learning in small groups focuses on scenario-based investigation and problem solving to understand the complex social world of medical training and practice. Problem solving and case-based scenarios can enrich the learners' development of both group and individual skills, including critical thinking, creative thinking, communication, and collaboration skills. These skills are often called *non-technical skills*. The overarching theme of leadership is one of many non-technical skills, and all are crucial to high-quality, safe, and effective patient care.[75-79]

**1.3.2.2. Transformative Education and Mental Models.** One of the main aims of transformative education is to provide learners with the ability to make informed decisions and actions. Often this requires an education model designed to transform a learner's *mental models* or meaning structures.[25,27,80-82] Johnson identifies mental models as:

> Our naturally occurring cognitive representation of reality, or ways in which reality is coded … [and] assembled into a mental model … [that] becomes a basis for our perception, analysis, understanding, and behaviour toward the object in question … in short, we think and act through our mental models.[80(p.86)]

Informational learning adds a depth of knowledge to an already structured mental model via training workshops, lectures, or conferences. However, informational learning has limited potential to develop new mental models that are capable of handling new and complex phenomena. Johnson's argument identifies leaders as more successful when their mental models for responding to complex issues, and how they view and deal with their world, are more valid for the challenges being faced.[80]

Transformative education could be used to develop medical student and clinician mental models when disorientating events of real-world significance occur,[83] or during problem-solving

scenarios that challenge their deep personal or sociocultural assumptions. The outcomes of transformative education could influence a deep shift in student and clinician worldviews about learning, healthcare, and the health system.[26,28] As transformative education has a focus on creating change agents, it seems essential to build leadership learning with a critical inquiry framework, addressing real-world events with significant problem solving and experiential learning opportunities. For example, Haber-Currran and Tillapaugh examined their undergraduate, student-centred and inquiry-focused leadership capstone course and identified five themes for transformative learning that occurred sequentially over the course.[27] These five themes are 1) challenging mental models of learning, 2) building trust, 3) finding freedom and empowerment, 4) deepening commitment to learning, and 5) reframing learning and self. Their findings were achieved due to a blend of pedagogy. The first pedagogy was a problem-based learning approach where students were provided with real-world problems they are likely to face in the future. The second feminist and critical race pedagogy engaged students in individual transformation and social change. The final pedagogy was a case-in-point pedagogy where student groups used themselves as a case study. By operating in the present, the student groups observed and discussed how their group dynamics were forming or changing, thus providing deep learning of how systems play a role within groups.

Due to the above, it was essential to consider how to encourage students' development as change agents via the teaching and assessment opportunities in the *MedStudentLead* framework (Phase 3, Chapter 6) framework. These teaching (and assessment) opportunities required a blended pedagogy combined with real-world problems medical students will face in the future or on placement in the clinical setting.[82] This blended approach was designed to build a transformative curriculum that is (not just informative, but) applicable to practice.[25,82]

## 1.4. Selecting a Research Methodology

### *1.4.1. Multiphase Study Design*

This study used a multiphase study design.[84] This design allowed for multiple studies to understand the *taught* and *should be taught* medical leadership skills, education and assessment across

the medical education continuum.[85] Each of the three data collection phases examined stakeholder groups from different levels of the medical education system. Questions from each phase were interconnected to investigate leadership training needs for the best practice in the Australian health system. Individual phases were analysed and reported on (written up for publication) separately, and findings from each phase were reflected on and contributed to the next study and phase. The multiphase study design is further discussed in Section 3.1.2.

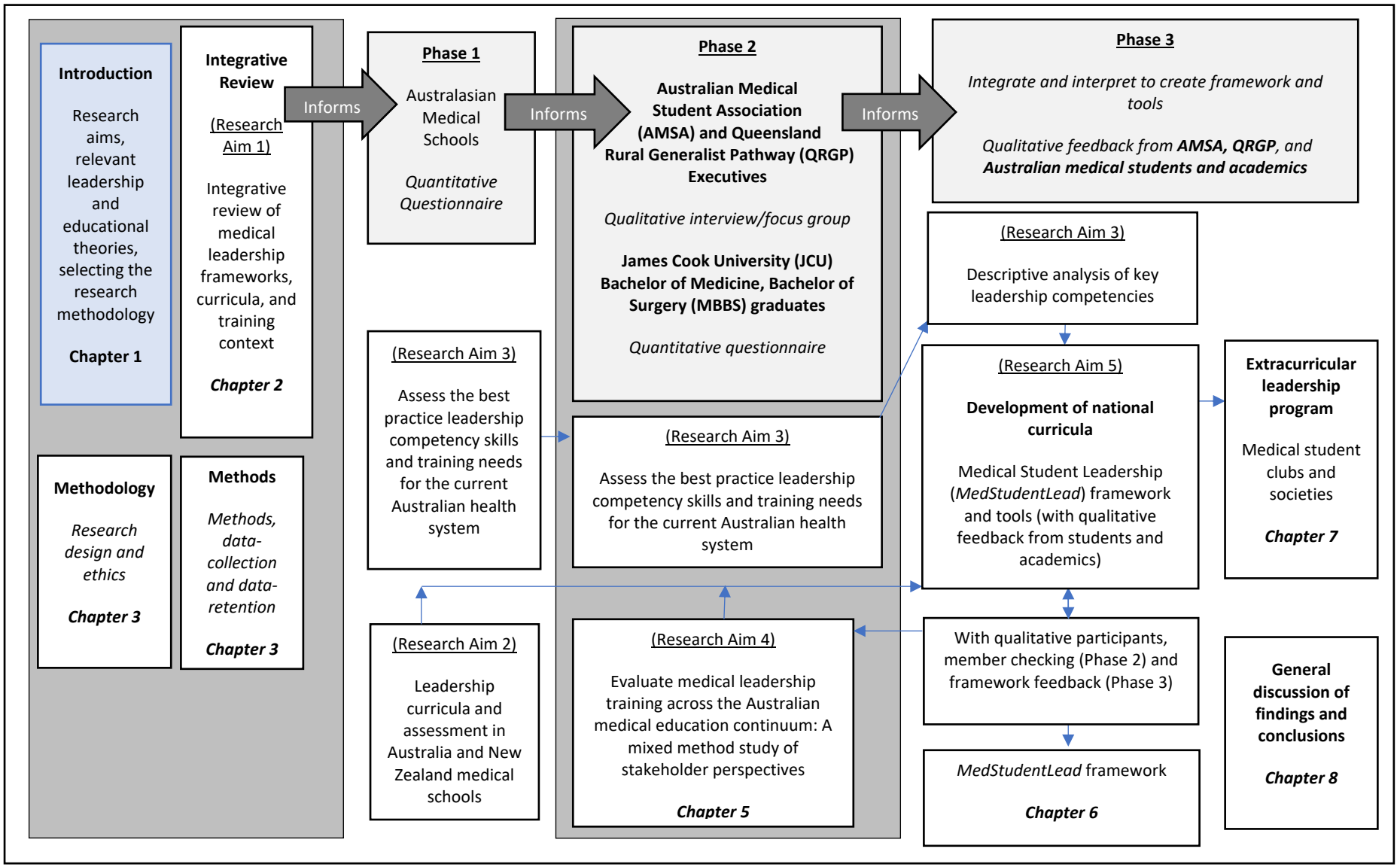
### *1.4.2. Pragmatic Paradigm*

This multiphase study involved a multiple-stakeholder approach to real-world evidence by exploring stakeholders' perceptions of medical leadership with respect to teaching and learning practices. The multiple phases led to the overall development of the *MedStudentLead* framework. Each of the three data phases was conducted sequentially (one after the other), however data was collected and purposefully held for phase 3 from each participant during phases 1 and 2. This is further discussed in Section 3.1.2. Cresswell[84] has advised that pragmatism is the only paradigm to use with this type of multiphase study design, as it focuses on the primary importance of the questions that are used to select the appropriate methods that work best to address the research aims (problem).[85,86] The pragmatic paradigm is further discussed in Section 3.1.

## 1.5. Structure of the Thesis

This thesis is organised into eight chapters. Figure 1 (below) provides a visual presentation of each chapter and research phase in relation to the research methods, aims, and participants. This study was iterative rather than linear. As data were collected in each phase, they were analysed, and the results were written. This allowed reflection on the previous findings when starting new phases of the research.

**Figure 1.** *Conceptual Framework and Overview of Thesis*



### *1.5.1. Chapter 1: Introduction*

This chapter presents an introduction and overview of the research. It has discussed the impetus for the research, the existing knowledge about the topic, and the outlined motivations for undertaking the study. The research aims and significance of the study have been justified, and the study design and research methodology discussed. This chapter now concludes with an overview of the thesis content and structure. The chapter was first written early in the study, then reviewed and updated close to submission to ensure relevancy to the current literature and theories.

### *1.5.2. Chapter 2: Integrative Review*

Chapter 2 extends the existing knowledge of the leadership theories and frameworks presented in Chapter 1. This integrative review examines the literature relating to leadership theories, reviews global medical leadership frameworks, and contextualises key areas relevant to the current Australian medical leadership education perspective. It also details the existing evidence base and highlights key gaps in the literature that guided the research process. Finally, the chapter discusses potential outcomes when leadership skills are lacking and concludes with recommendations.

Chapter 2 presents the first study that was completed and then published in *BMJ Leader* (Appendix A). This integrative review was necessary to examine the literature regarding medical leadership, leadership theories, and global medical leadership frameworks. Further, the review was necessary to contextualise key areas relevant to the current Australian medical leadership education perspective. The integrative review is related to the following research aim:

> Research Aim 1. Review the current medical leadership frameworks and curricula available domestically and globally, then adapt them to suit Australian undergraduate medical education programs and the health system, where appropriate.

**Publication Reference**

Ross SJ, Sen Gupta T, Johnson P. Why we need to teach leadership skills to medical students: a call to action. BMJ Leader, 2019;3(1):6–10. Doi:10.1136/leader-2018-000124

This publication can be found in Appendix A.

### *1.5.3. Chapter 3: Methodology and Methods*

Chapter 3 explains the methodology. and methods. For the methodology, this includes the multiphase study design and why it was used for this study. The requirement for mixed method research is discussed along with how it provided a more comprehensive view of leadership in the medical education continuum. Figure 2 (Section 3.1.2) introduces a visual presentation of the multiphase study design, including the three phases involved in the design. Table 1 (Section 3.2.1) provides a data-collection overview of each phase. This table includes the timeline, subjects, sample size, data collected, and data files used.

For the methods, data chapters written as manuscripts (Chapters 4 and 5) are appended with their methods section. However, each of Chapter 4 and 5 has written methods such as sampling and ensuring content validity included in Chapter 3. Otherwise, for the data chapter not written as a manuscript (Chapter 6) the methods are found in Chapter 3.

### *1.5.4. Chapter 4: Leadership Curricula and Assessment in Australian and New Zealand Medical Schools*

Chapter 4 presents the first of three findings chapters related to this research. This chapter discusses Phase 1 of the multiphase study design and examines the current medical leadership and assessment findings from the quantitative questionnaire sent to the 22 Australasian Medical Schools. The full survey was published as supplementary material and is located in the published online article (below). This study is related to the following research aim:

> Research Aim 2. Critically evaluate the leadership teaching and assessment skills across the 22 Australasian medical schools.

**Publication Reference**

Ross SJ, Sen Gupta T, Johnson P. Leadership curricular and assessment in Australian and New Zealand Medical Schools. *BMC Medical Education*. 2021;28(21). Doi:10.1186/s12909-020-02456-z

This publication can be found in Appendix F.

### *1.5.5. Chapter 5: Medical Leadership Training Across the Australian Medical Education Continuum*

Chapter 5 presents the second of three findings chapters related to this research. This chapter discusses Phase 2: a mixed methods study examining the current medical leadership and assessment across the medical education continuum. This chapter was submitted to *BMC Medical Education* on December 4, 2023. The participant groups and methods of data collection include:

1. A focus group with Queensland Rural Generalist Pathway (QRGP) executives ($n$ = 5).
   Information sheet and informed consent form – Appendix B
   Semi-Structured focus group guide - Appendix C
2. Interviews with the Australian Medical Student Association (AMSA) executives ($n$ = 4).
   Information sheet and informed consent form – Appendix B
   Semi-structured interview guide - Appendix D
3. A survey of JCU medical postgraduates in their fourth year or more (PGY4+; $n$ = 204).
   Medical leadership survey (with information sheet and informed consent) for JCU graduates - Appendix E

This study evaluated medical leadership training across the Australian medical education continuum and provided a comprehensive cross-sectional study of stakeholder perspectives. The outcomes highlighted participants' current leadership experiences, role model influences, barriers, and recommendations for change. Detailed, conventional content analyses of responses to the open-ended survey, interview, and focus group questions were added as four appendix files to the submitted manuscript (Appendix G). This study is related to the following research aim:

> Research Aim 3. Critically evaluate current leadership opportunities, training, and experiences across the medical education continuum as informed by medical student executives, graduates, and specialist leadership trainers.

**Manuscript reference**

Ross SJ, Sen Gupta T, Johnson PJ. Medical leadership training across the Australian medical education continuum: A mixed methods study of stakeholder perspectives. Submitted manuscript. Submitted to *BMC Med Educ* December 4, 2023.

### *1.5.6. Chapter 6: MedStudentLead Framework*

Chapter 6 presents the third of three findings chapters related to this research. This chapter discusses Phase 3: the data analysis and development of the *MedStudentLead* framework. The data analysis involved two sets of data. The first set of data is the leadership competency matrix every participant completed. Within this matrix, each participant identified when leadership competencies *should be taught* across the medical leadership continuum. These matrices were deliberately held back from previously published data in earlier chapters, as they addressed Research Aim 5 in Phase 3. The second set of data is the medical leadership and assessment recommendations from the previous two phases (Chapters 4 and 5). This study relates to the following research aims:

> Research Aim 4. Determine the leadership training needs for the best practice in the Australian health system, as informed by academic leads and/or college deans, medical student executives, graduates, and specialist leadership trainers.
>
> Research Aim 5. Develop and validate a medical student leadership framework and teaching and assessment tools to suit medical leadership education and assessment at the medical school level.

The *MedStudentLead* framework and resources are available on the website listed below.

**The *MedStudentLead* Framework Website Reference**

Ross, SJ. The *MedStudentLead* framework. Finalised November, 2023. www.medstudentlead.com.au

### *1.5.7. Chapter 7: Implementing a Student Extra-Curricular Leadership Program*

Chapter 7 presents 12 tips for implementing an extra-curricular leadership program for medical student clubs and societies. This chapter was written to address the commonly stated barrier that leadership skills training is less likely to happen in a medical degree due to an already crowded curriculum. Therefore, an extra-curricular leadership program was proposed for students who are in leadership positions, for example, within a medical student society.

This study relates to the following research aim:

Research Aim 5. Develop and validate a medical student leadership framework and teaching and assessment tools to suit medical leadership education and assessment at the medical school level.

The manuscript for Chapter 7 (Appendix H) was rejected by the *Medical Teacher* journal on 23 February 2023, with a high recommendation of eligibility to publish with the *MedEdPublish* journal. The *MedEdPublish* journal has been in contact; however, submission has been delayed due to post-publication peer review and the cost of submission.

**Manuscript reference**

Ross SJ, Sen Gupta T, Johnson PJ. Twelve tips for fostering an extra-curricular leadership program for medical student clubs and societies. Prepared manuscript.

### *1.5.8. Chapter 8: General Discussion of Findings and Conclusion*

Chapter 8 presents a synthesis of the research findings. The overall research strengths and limitations are also defined. This chapter concludes with a discussion about the implications for policy, implications for education practice, recommendations for medical leadership skills training, and recommendations for future research.

This research highlights that medical leadership training in Australia is not delivered systematically across the medical education continuum. Medical students are not taught key leadership skills, and teachers require training to teach leadership skills linked to future practice. Moreover, clinicians are not systematically receiving formal leadership training as part of their continuing professional development or specialist training. It is time to have a national medical student framework with appropriate leadership curricula, teaching and assessment strategies, and guidelines. Teaching our students leadership skills will benefit them, their colleagues, the community they serve, and their patients. Failing to act is not an option.

# Chapter 2. Integrative Review of the Literature

## 2.1. Introduction

This chapter is the first publication for this study and is published in *BMJ Leader*. It is an integrative review of the literature regarding medical leadership and examines both empirical and grey literature relating to leadership theories. See a copy of Figure 1 below for an overview of this review in relation to the entire thesis.

This integrative review is believed to be the first paper of its kind to review and analyse published medical leadership frameworks.[1-3] It reviews the limited amount of global medical leadership frameworks and contextualises key areas relevant to the current Australian medical leadership education perspective. It details the existing evidence base and highlights key gaps in the literature which guided the research process. The paper also discusses the outcomes when leadership skills are lacking and concludes with recommendations to address the paucity of national training, curricula, learning outcomes, evaluations, and research agenda.

Many of the references are added to this thesis in other chapters, however, the article and references are a standalone document. The methods of this chapter are found in Chapter 3, Section 3.2.2. This study relates to the following research aim:

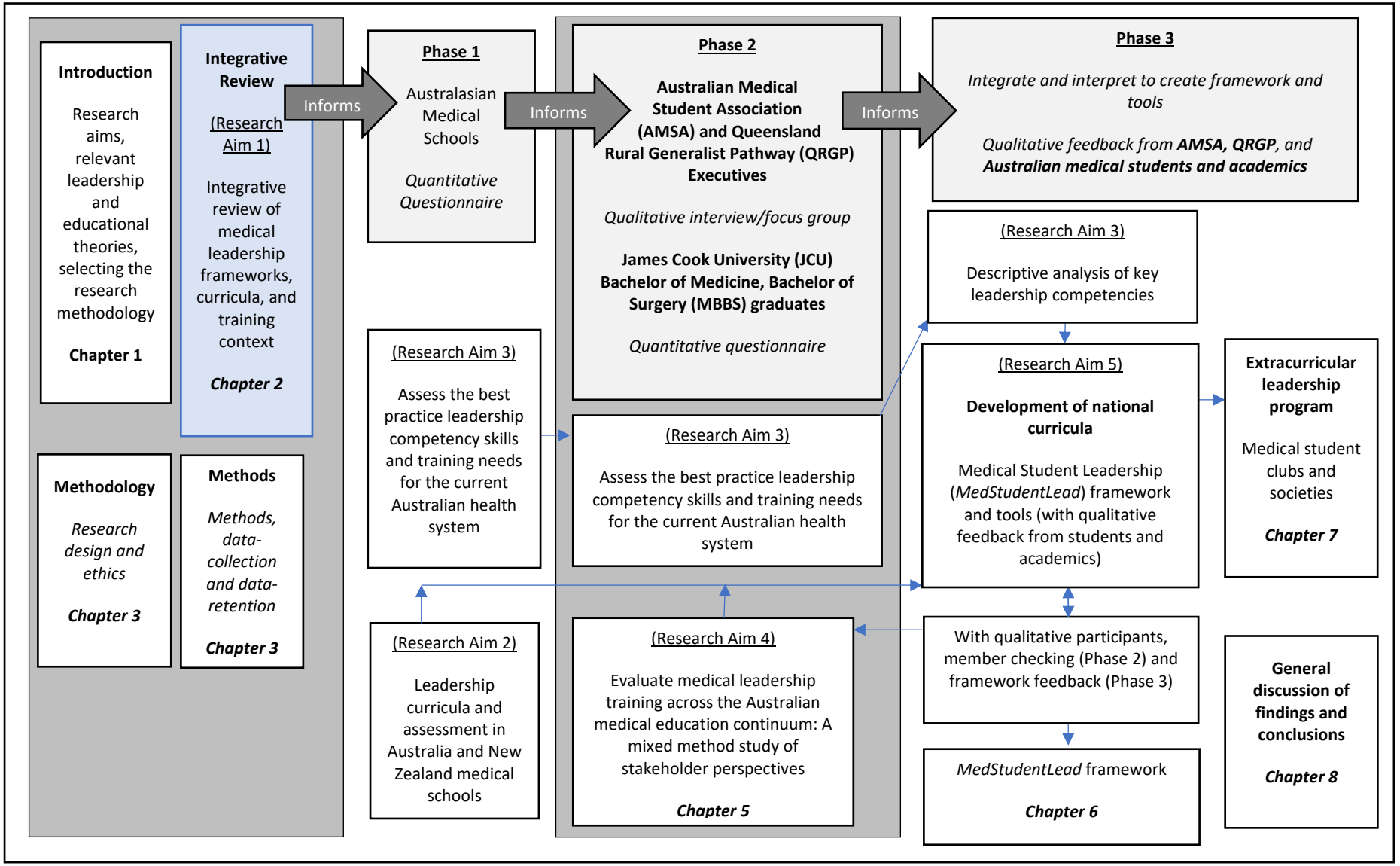
> Research Aim 1. Review the current medical leadership frameworks and curricula available domestically and globally, then adapt them to suit Australian undergraduate medical education programs and the health system, where appropriate

**Publication Reference**

Ross SJ, Sen Gupta T and Johnson P (2019). Why we need to teach leadership skills to medical students: a call to action. *BMJ Leader,* 3(1), pp 6-10, doi:10.1136/leader-2018-000124.

*Appendix A. Published Integrative Review for BMJ Leader*

**Copy of Figure 1.** *Overview of This Study*



### 2.2. Summary of the Major Findings of This Chapter

The objective of this integrative review was to provide a comprehensive understanding of the state of medical learning training both worldwide and separately with a particular focus to Australia. An overall aim was to synthesise the empirical literature and medical leadership frameworks having a direct applicability to practice.

Leadership training for medical students is a professional competency as important as any other and will help foster the development of professional identity. There are no national strategies, resources and/or teaching activities, or competencies to meet recommended leadership health reform. Teaching medical students to cope with change, prioritise, be humble, and work in and lead/inspire a team, are, at a minimum, effective strategies for working in an inter-professional health setting. Leadership skills training can occur in the medical curricula, on placement, and via student clubs. Self-reflection and effective feedback will enhance both formal and informal learning. Like the UK framework[1], an Australian framework needs to focus on evidence-based practice for patient care and safety and provide an epidemiological skills-set for evaluating the leadership curriculum. A nationally accepted framework with examples of leadership training would provide consistent education across medical student education and resultant clinical practice. Discussing and evaluating the Australian leadership training needs with students, teachers, deans, and accrediting bodies will help identify and address these needs. Providing our students with the skills to be transformative leaders will benefit them in the future as well as benefit the staff they work with, the communities they serve and their patients.

# Chapter 3. Methodology and Methods

## 3.1. Methodology

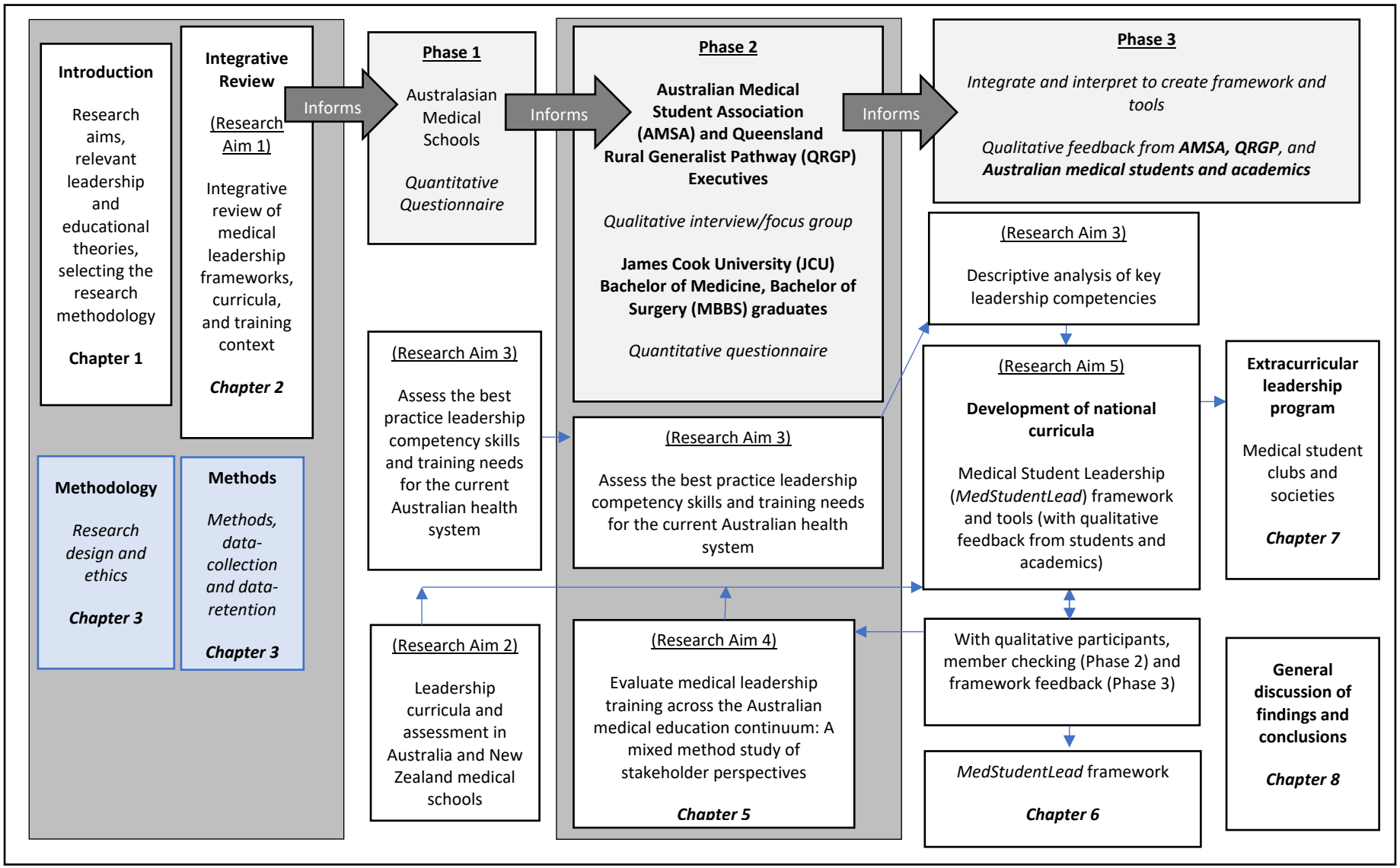
### *3.1.1. Introduction*

Previous chapters have discussed the research aims, the context of the study, the factors that have shaped its development, and the integrative review of relevant literature. This chapter explains the choice of the overall study design, as well as the methods used to examine each stakeholder group's perspectives of Australian medical leadership training needs for best practice across the medical education continuum. In addition, while individual chapters written for publication have their respective methods within the appendix's publication or manuscript, sampling and content validity methods are described in this chapter. A copy of Figure 1 is presented below for reference to this chapter in relation to the entire thesis. An overview of data collection across the multiphase study is provided in Table 1.

### *3.1.2. Multiphase Study Design and Philosophy*

As discussed in Section 1.4.1, this multiphase study had three projects (phases) where multiple forms of quantitative and qualitative data were collected to address the research aims.[86] Mixed method theorists state that the multiphase study design is a form of mixed methods research allowing researchers to follow emerging questions.[87] This multiphase study design was developed using the pragmatic paradigm. Cresswell states: "The pragmatist researcher looks to what and how to research, based on the intended consequences – where they want to go with it … and pragmatists agree that research always occurs in social, historical, political and other contexts."[86(p.11)] Pragmatism was used due to the concurrent design of Phase 2 that collected both quantitative and qualitative data with different participants during the same phase. Using pragmatism allowed for this research to be conducted in a specific way depending on the intended consequences.[86,88,89] Therefore, the chosen methodology worked to enhance holistic understanding[90] rather than engage in a search for consensus or truth.[91-93] In other words, the questions are focused and advocate action over philosophy.[91]

**Copy of Figure 1.** *Overview of This Study*



During this research, much consideration occurred regarding how to connect the research aims to the phases while addressing multiple stakeholders. This research also combined findings from the existing literature evidence base and collected empirical data (see Figure 2 below). Both quantitative and qualitative research techniques were used to gain a more complete understanding of the medical leadership training and assessment across the medical education continuum.

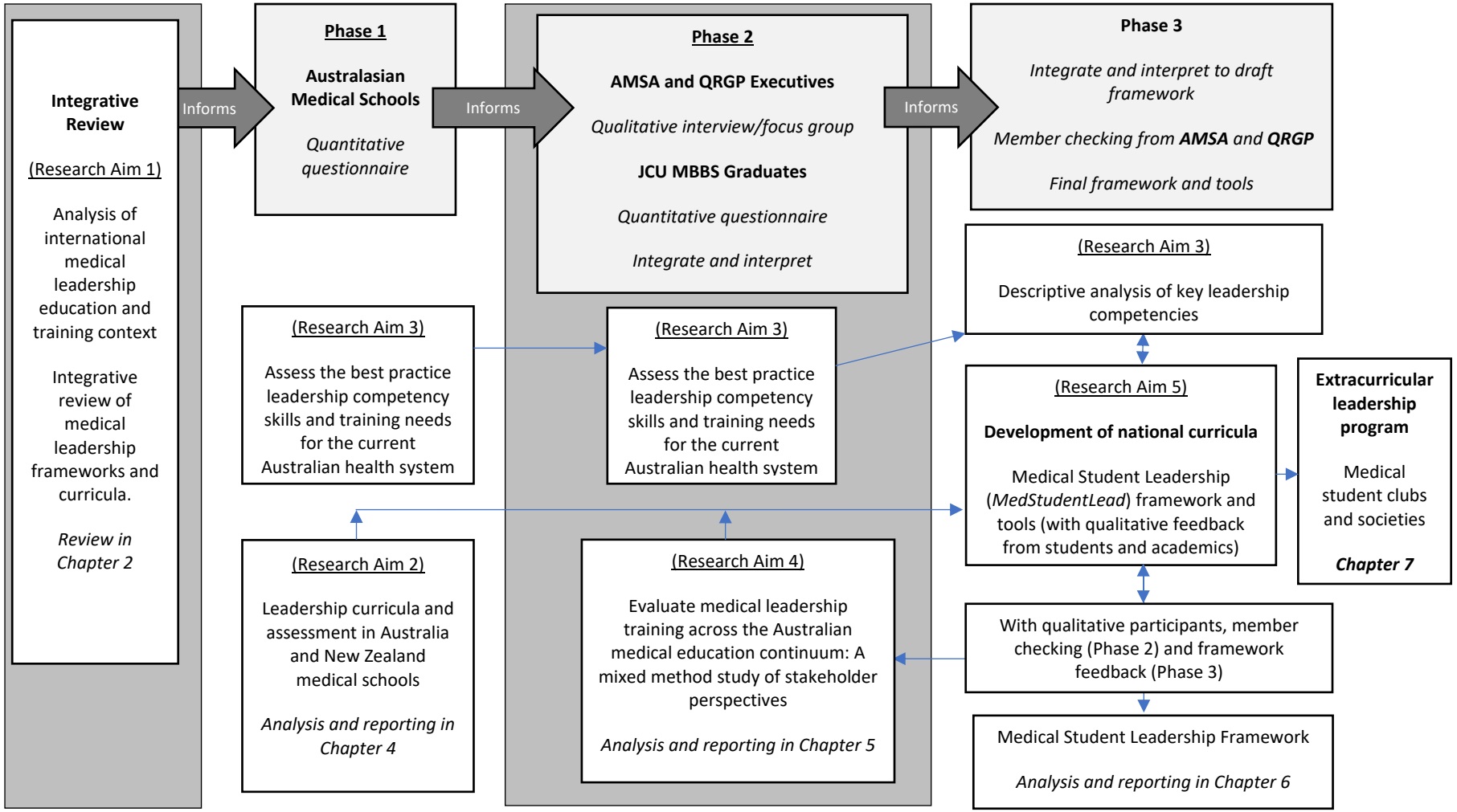
Cresswell defines mixed methods research as:

> An approach to research in the social, behavioural, and health sciences *in which the investigator gathers both quantitative and qualitative data, integrates the two, and then draws interpretations based on the combined strengths of both sets of data to understand research problems* [emphasis added].[84(p.2)]

Using the multiphase study design, a mixed methods approach allowed a more comprehensive view and collected more focused data about the extent of leadership education in medical teaching than either a quantitative or qualitative perspective. It allowed a greater in-depth understanding of the lived experiences of medical students, medical leadership trainers, and JCU graduate doctors gaining leadership competencies.

As per a multiphase study design and mixed methods research, the findings of the integrative study (Chapter 2) informed the development of Phase 1, including the research questions for the quantitative survey sent to medical schools (Chapter 4). The integrative review and Phase 1 then informed the development of Phase 2, including the research questions for both the quantitative survey to JCU Bachelor of Medicine, Bachelor of Surgery (MBBS) graduates (doctors) and the qualitative interview guide and focus group guide for AMSA and QRGP (Chapter 5). Finally, to triangulate all findings into one, the findings of the integrative review, along with the findings from Phases 1 and 2, informed the development of the *MedStudentLead* framework (Chapter 6).

**Figure 2.** *Multiphase Study Design*




*Note*. AMSA = Australian Medical Student Association executives. QRGP = Queensland Rural Generalist Pathway executives. JCU MBBS graduates = James Cook University Bachelor of Medicine and Bachelor of Surgery Graduates.

Research Aim 1 “review the current medical leadership frameworks and curricula available domestically and globally, then adapt them to suit Australian undergraduate medical education programs and the health system, where appropriate” was applied during the integrative review. Research Aim 2 “critically evaluate the leadership teaching and assessment skills across the 22 Australasian medical schools” was applied during Phase 1. Research Aim 4 “determine the leadership training needs for the best practice in the Australian health system as informed by academic leads and/or college deans, medical student executives, graduates, and specialist leadership trainers” was applied during Phase 2. Phase 2 occurred during the peak of COVID-19 and there were delays in data collection. Finally, Research Aim 3 “critically evaluate current leadership opportunities, training, and experiences across the medical education continuum as informed by medical student executives, graduates, and specialist leadership trainers” was applied during Phases 1 and 2.

During Phases 1 and 2, each stakeholder (participant) (see Chapter 3, Section 3.2.1, Table 1) was asked to complete a matrix of leadership competencies and advise when these competencies should be taught in the medical education continuum from medical students to junior doctors and senior clinicians (see Chapter 3, Section 3.2.5, Table 4). During the research, these completed matrices were purposefully held back from the data reporting of Phases 1 and 2 and were used in Phase 3 to address and Research Aim 5 “develop and validate a medical student leadership framework and teaching and assessment tools to suit medical leadership education and assessment at the medical school level.” By linking the findings from the integrative review, and Phases 1 and 2 with the completed matrices, a national medical leadership competency framework (*MedStudentLead*) was developed for medical students and academics (see figure 2 above).

Lastly, member checking of the framework was undertaken, allowing for in-depth focus and reflection on each research aim and the matching of data within each section of the framework.

### *3.1.3. Ethics*

This study has the JCU Human Resource Ethics Committee’s approval, acquired on 5 July 2017 with the application number H6985 (expiry 31 December 2023).

#### *3.1.4. Data Management and Protection*

Data retention and storage for this research have been addressed in accordance with the *Australian Code for the Responsible Conduct of Research, 2018*.[94] Most of the data have or will be published via journal articles. Due to the amount of data generated in this study, and as per the ethics requirements, a clear data management plan was implemented to ensure the data could not be lost, mislabelled, or miscoded. The following strategies were used:

- All research data will have been retained for at least five years on the university intranet, which is password protected and non-identifiable for participating students or graduates.
- The audio files were deleted from Zoom and the QSR International NVivo Transcription (NVivo) software after transcription.
- The audio file codes, transcripts, and surveys followed set naming rules to allow for easy retrieval.
- The software, NVivo, Microsoft Excel, and IBM SPSS, were used to organise, manage, and analyse data.

### 3.2. Methods

#### *3.2.1. Data Collection Overview*

This research explored leadership training, assessment, and experiences across the medical education continuum, and it used both quantitative categorical questionnaire data and qualitative interview and focus group data. This mixed-method study purposefully includes data from four levels of the medical education system designed to advance the knowledge, understanding and practice of medical leadership training across the medical education continuum in Australia (below). As well as relevant and Australian and global medical leadership literature (Chapter 2). See Table 1 (below) for an overview of the data collection phases and tools used in this research.

The four sources of data needed for the study included:

- medical school data on leadership skills and knowledge currently taught (Chapter 4, Phase 1)

- medical students' perceptions on what should be taught (Chapter 5, Phase 2)
- medical doctors' perceptions on what should be taught (Chapter 5, Phase 2)
- executives of graduate leadership training perceptions on what should be taught (Chapter 5, Phase 2)

Due to these requirements, there were four different participant groups:

- medical school deans and academic heads of the 22 Australasian and New Zealand medical schools
- AMSA national executives who were national leaders at the time of the research
- executives and program developers of the QRGP Program who evaluate and publish the outcomes of their graduate leadership training programs
- graduates of the JCU MBBS program who agreed to future contact by the college at the time of their graduation. These are doctors who work both metropolitan and rural / remote, and across the states and territories of Australia.

Information sheets and informed consent were provided to all participants. See Chapter 4 and Appendix F for phase 1, and Appendix B, C, D, and E for phase 2. All participants participated voluntarily, provided informed consent and for the data to be de-identified and published anonymously.

**Table 1.** *Overview of the Data Collection Phases and Tools of This Research*

| Phase | Timeline | Subject | Sample size | Data collected | Data files |
|---|---|---|---|---|---|
| Phase 1. Quantitative survey<br>See Chapter 4 and Appendix F. | Online questionnaire emailed once in November 2018 and July 2019 | Senior academics and heads or deans of Australasian medical schools | Eligible medical schools: *n* = 16 (73% of 22 schools) | Completed questionnaires | Excel and SPSS files |
| Phase 2. Semi-structured interview<br>See Appendix D. | March–June 2020 (During COVID-19 Lockdown) | Australian Medical Student Association (AMSA) 2020 executives | Executives: *n* = 4 | Transcripts and recordings | NVivo file |
| Semi-structured focus group interview<br>See Appendix C. | November 2020 (During COVID-19 Lockdown) | Queensland Rural Generalist Pathway (QRGP) executives | Executives: *n* = 5 | Transcripts and recordings | NVivo file |
| Quantitative survey<br>See Attachment E. | Online questionnaire emailed three times. Twice in November and once in December 2021 (During COVID-19) | Bachelor of Medicine, Bachelor of Surgery (MBBS) graduates from James Cook University (JCU) 2005 to 2018 (PGY4+) | Graduates: *n* = 206 (34% of 610 eligible graduates). 204 eligible surveys with one case removed as it had missing demographic data, the other case was overseas.<br>Junior doctors: *n* = 19<br>Specialists in training: *n* = 51<br>General practitioners: *n* = 65<br>Specialists: *n* = 63 | Completed questionnaires | NVivo file<br>SPSS file |
| Phase 3. Member checking with qualitative participants | March 2023 | AMSA 2023 president and QRGP executives | AMSA president: *n* = 1<br>Executives: *n* = 2 | Transcripts and recordings | NVivo file |
| End-user feedback from academics | June 2023 | Academics from 2023 the Australian & New Zealand Association for Health Professional Educators (ANZAHPE) Conference | Senior medical academics: *n* = 6 | Email communication | |

### *3.2.2. Integrative Review of the Literature*

This section relates to Chapter 2, which was published in 2018.[23] The below information outlines the methods of the integrative review (Appendix A).

At the time of collecting data for the integrative review (2017) and writing it (2018), there was a paucity of published literature on the subject of medical leadership, with just three medical leadership frameworks found in the UK 2010[1], Australia 2013[2], and Canada 2014.[3] There was also a lack of published research with clear methodological detail on how to conduct integrative reviews with robust research strategies. Due to this, purposive sampling was employed and specifically focused on the topics required for the review. These were:

- health system reform recommendations mentioning medical leadership
- leadership styles relevant to medical leadership training
- published medical leadership frameworks
- publications about teaching and assessment of leadership skills training
- an Australian historical perspective of medical leadership
- gaps in the medical leadership training
- transformational leadership education.

Citation searching of relevant articles also occurred to identify further literature. The overall selection of literature included both empirical and grey literature.[95,96]

### *3.2.3. Phase 1: Leadership Curricula and Assessment in Australia and New Zealand Medical Schools Questionnaire*

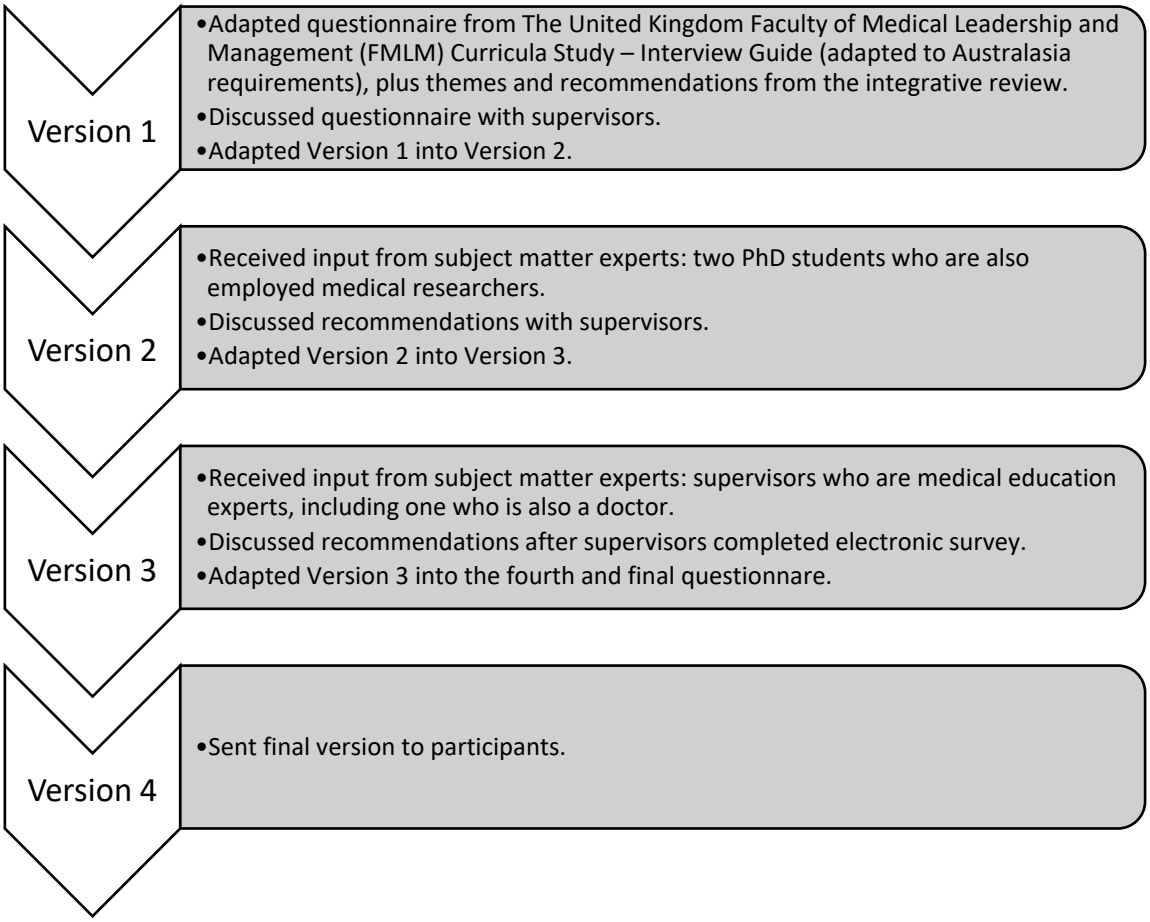
This section relates to Chapter 4 and was published in 2021.[24] As this chapter is published with detailed methods and questionnaire, only the content validity of the *Medical Leadership Curricula, Assessment and Evaluation Survey* development is discussed below.

**3.2.3.1. Content Validity of the Australasian Medical Educators Survey.** The content validity of the *Medical Leadership Curricula, Assessment and Evaluation Survey* sent to academics, deans, and

Australasian medical schools was confirmed in three stages.[97] The first stage was the development of Version 1 of the questionnaire. The *UK Faculty of Medical Leadership and Management Curricula Study – Interview Guide*[12] was used as the foundation for this, with questions chosen and then adapted to Australasian medical leadership requirements. Other questions were developed from the themes and recommendations produced from the integrative review (Chapter 2). The second stage received input from subject matter experts. In this case, the subject matter experts were supervisors of this research who are medical education expert academics, and two PhD students who are also employed medical researchers. Three questionnaire drafts were produced before the final questionnaire (See Figure 3).

**Figure 3.**

*Receiving Input From Subject Matter Experts in the Development of the Medical Leadership Curricula, Assessment and Evaluation Survey (Phase 1)*



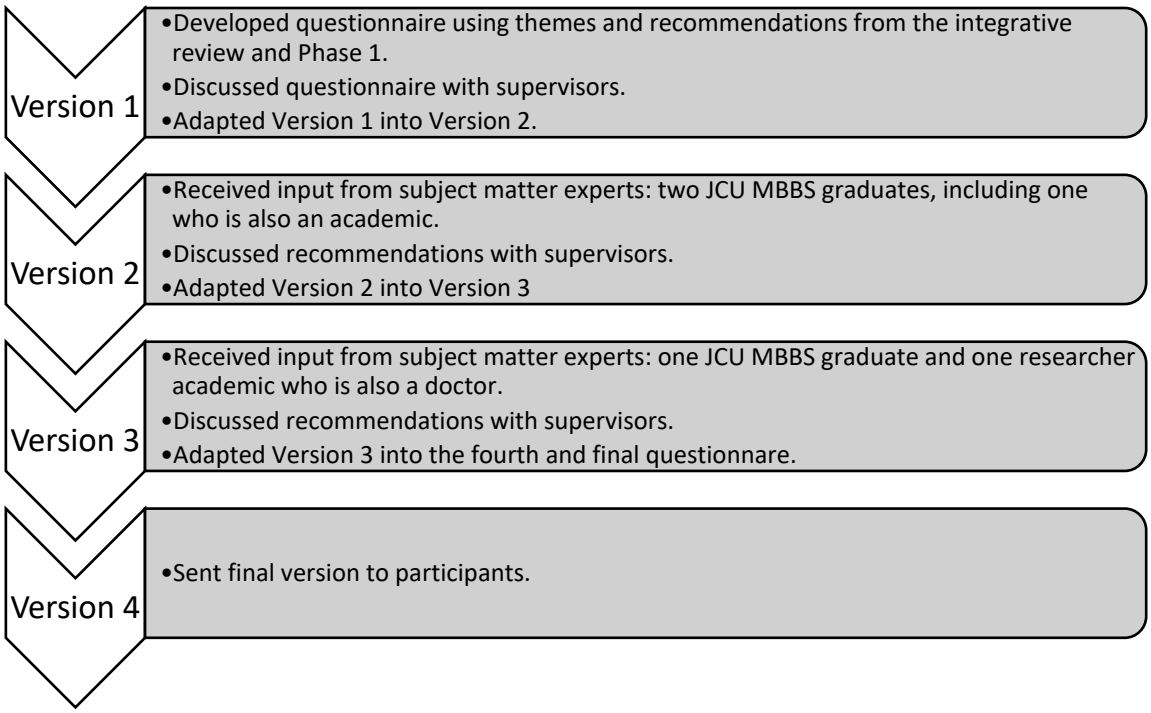
### *3.2.4. Phase 2: Medical Leadership Training Across the Australian Medical Education Continuum*

Phase 2 relates to Chapter 5 and has been submitted for publication (Appendix G). As this manuscript was submitted with detailed methods, only the content validity of the *Medical Leadership Survey for Doctors* development and member checking from qualitative participants is discussed below.

**3.2.4.1. Content Validity of the Medical Leadership Questionnaire for Doctors.** The content validity of the *Medical Leadership Survey for Doctors* to JCU MBBS graduates (doctors) was confirmed in three stages.[97] The first stage was the development of questionnaire Version 1 using the themes and recommendations produced from the integrative review (Chapter 2) and Phase 1 (Chapter 4). The second stage involved receiving input from subject matter experts. In this case, the subject matter experts were the supervisors of this research, graduates from the JCU MBBS program, and academics or researcher academics who are also medical doctors. Three questionnaire drafts were produced before the final questionnaire (see Figure 4).

**Figure 4.**

*Receiving Input From Subject Matter Experts in the Development of Medical Leadership Survey for Doctors (Phase 2)*




**3.2.4.2. Member Checking From Qualitative Participant Groups.** To explore the credibility of findings, two members of QRGP participated in member checking of the manuscript's qualitative themes. The full draft of the manuscript was viewed and fully discussed during an online Zoom meeting. The meeting was recorded, and the recording uploaded to NVivo. The findings were confirmed. No recommendations were made and consensus was attained, however one content analysis sub-theme was not validated. This sub-theme was from the 'Formal Leadership Training Barriers' theme, 'Financial Cost of Training.' The QRGP members disagreed with other participants' perceptions that the cost of formal leadership training was expensive in comparison to other formal training doctors can choose to complete.

Much effort was made to contact the 2020 AMSA participants. Due to the voluntary nature of AMSA, the participants were unable to meet and explore the credibility of these findings. They are now medical graduates (doctors) and no longer associated with AMSA. However, this manuscript was shared

face-to-face with a 2023 AMSA senior volunteer who agreed that the findings and recommendations were realistic. This has been added as a limitation in the manuscript.

### *3.2.5. Phase 3: Leadership Education for the MedStudentLead Framework*

As detailed in Chapter 2 of this thesis, three clinical education leadership frameworks from the UK, Australia and Canada were published between 2010–2014.[1-3] The UK developed the MLCF in 2010[1], Australia developed the *Health LEADS Australia* framework in 2013[2] and modelled it after the UK framework, and Canada developed the *LEADS in a Caring Environment* framework in 2014.[3] All three frameworks have similar domains, but differences in how health services are approached and what career stages they have been created for. For example, the Canadian framework was written for the medical education continuum from medical school to medical professionals in practice, whereas the Australian and UK frameworks were written for health professionals in practice.

#### 3.2.5.1. Selection of Key Leadership Competency Options for the Medical Education Continuum.

For this study, the *Health LEADS Australia* framework[2] was chosen as it is written from the Australian health system perspective and can be adapted for relevance to medical education across the continuum (discussed in Chapter 2). The five *Health LEADS Australia* domains are Lead Self, Engages with Others, Achieves Outcomes, Drives Innovation, and Shapes Systems. Upon critical review, this framework required further development of specific leadership competencies within each domain.[98,99] Leadership and management competencies were selected from the book *Leading and Managing Health Services: An Australian Perspective*.[100] The competencies were chosen to be relevant for medical leadership in the Australasian health service and across the medical education continuum. Within the book, each topic (competency) is written as a separate chapter under a *Health LEADS Australia* domain. See Table 2 below.

**Table 2.**

*Leadership Domains and Competencies for the Australian Medical Education Continuum*

| Domains [a] | Competencies [b] |
|---|---|
| 1. Leads Self | • critically reflective practice<br>• ethical decision making |

| | |
|---|---|
| | • self-management<br>• emotional intelligence and awareness<br>• exploring values |
| 2. Engages Others | • communication<br>• interprofessional teamwork<br>• partnering with stakeholders<br>• networking<br>• power in organisations |
| 3. Achieves Outcomes | • critical thinking and decision making<br>• managing staff<br>• negotiation<br>• project management<br>• financial management |
| 4. Drives Innovation | • evidence-based practice and use<br>• quality and service improvement<br>• building positive workplace culture<br>• successfully managing conflict<br>• creativity and visioning<br>• leadership and management of change |
| 5. Shapes Systems | • health service planning<br>• strategic planning<br>• workforce planning |

[a] Domains from the *Health LEADS Australia* Framework. [b] Competencies from the book *Leading and Managing Health Services: An Australian Perspective*.

A few of these competencies are traditionally associated with management rather than leadership (e.g., project management and financial management); however, these competencies allow leaders to have the knowledge required to successfully lead teams and organise goals and, engage in health system innovation to improve healthcare and organisational processes. As argued by Sandhu, "every manager has to have leadership skills and all leaders must know how to manage and run their budgets."[101(p.616)] Leaders also require an understanding of project management to guide the direction of individuals and the systems in which they work[102]. At the same time, leaders need to motivate and inspire staff to cope with the complexity of change, otherwise, outcomes may affect the healthcare system and patient care. Each of these competencies could also be expanded across the medical education continuum depending on the current learner's experience and knowledge.

Participants in Phase 1 (medical academics and deans) were provided with two matrices of leadership competency skills. See Table 3 and Table 4 below. For Table 3, participants were asked "to

what level do you feel each of the below leadership skills are covered in your medical school curricula?" This was to collect a snapshot of leadership competencies and the level they were *taught* in Australasian medical schools.

**Table 3**

*Matrix 1: Key Medical Leadership Competencies Taught in the Medical School Curricula*

| Health LEADS domain | Competencies | Not at all covered | Introduced | Reinforced | Mastered | Couldn't Say |
|---|---|---|---|---|---|---|
| Self | Ethical decision making | | | | | |
| | Self-management | | | | | |
| | Emotional intelligence and self-awareness | | | | | |
| | Exploring values | | | | | |
| | Critical reflective practice | | | | | |
| Engages Others | Communication | | | | | |
| | Interprofessional teamwork | | | | | |
| | Partnering with stakeholders | | | | | |
| | Power in organisation | | | | | |
| | Networking | | | | | |
| Achieves Outcomes | Critical thinking and decision making | | | | | |
| | Managing staff | | | | | |
| | Project management | | | | | |
| | Financial management | | | | | |
| | Negotiation | | | | | |
| Drives Innovation | Creativity and visioning | | | | | |
| | Evidence-based practice and use | | | | | |
| | Successfully managing conflict | | | | | |
| | Building positive workplace culture | | | | | |
| | Leadership and management of change | | | | | |
| | Quality and service improvement | | | | | |
| Shapes Systems | Workforce planning | | | | | |
| | Strategic planning | | | | | |

| Health LEADS domain | Competencies | Not at all covered | Introduced | Reinforced | Mastered | Couldn't Say |
|---|---|---|---|---|---|---|
| | Health service planning | | | | | |

*Note.* An organisation is accredited to provide approved programs of study that lead to registration as a medical practitioner.

Participants in Phase 2 did not receive Matrix 1 (above, Table 3). Matrix 2 (below, Table 4) was provided to all participants, including those in Phase 2. Participants were asked "at what education level do you believe the following leadership skills *should be taught* across the medical education continuum?" This was to collect an overview from all four stakeholder groups (participants) of when competencies should be taught within a particular medical training level. These findings were used to develop the *MedStudentLead* framework.

**Table 4.**

*Matrix 2: Key Leadership Competencies That Should be Taught Across the Medical Education Continuum*

| Health LEADS domain | Competencies | Basic medical education [a] | Junior doctor | Senior clinician |
|---|---|---|---|---|
| Self | Ethical decision making | | | |
| | Self-management | | | |
| | Emotional intelligence and self-awareness | | | |
| | Exploring values | | | |
| | Critical reflective practice | | | |
| Engages Others | Communication | | | |
| | Interprofessional teamwork | | | |
| | Partnering with stakeholders | | | |
| | Power in organisation | | | |
| | Networking | | | |
| Achieves Outcomes | Critical thinking and decision making | | | |
| | Managing staff | | | |
| | Project management | | | |
| | Financial management | | | |
| | Negotiation | | | |
| | Creativity and visioning | | | |

| | |
|---|---|
| Drives Innovation | Evidence-based practice and use |
| | Successfully managing conflict |
| | Building positive workplace culture |
| | Leadership and management of change |
| | Quality and service improvement |
| Shapes Systems | Workforce planning |
| | Strategic planning |
| | Health service planning |

[a] Basic medical education is a medical program with a degree qualification that permits the holder to seek general registration as a medical practitioner.

The introduction section to Matrix 2 advised that participants could answer with multiple choices across medical education continuum levels (Table 4). Medical academics and deans (Phase 1) and JCU MBBS graduates (Phase 2) completed Matrix 2 via two separate questionnaires. The same matrix was provided in interviews with AMSA and a focus group with QRGP (Phase 2). As these interviews were conducted via Zoom, Matrix 2 was shared on the screen to allow for greater transparency. Participants read each competency out loud and elected when each leadership competency *should be taught* across the medical continuum.

**3.2.5.2. Data Analysis.** Phase three focused on data from Matrix 2 (Table 4). Microsoft Excel was used to analyse the ratio data participants' self-reported proposed medical leadership competencies. This analysis converted the ratio data into frequency distributions by percentage. In other words, the number of participants who agreed that the leadership competency was necessary within a particular medical training level (e.g., to teach to a junior doctor) was converted to a percentage. Three different descriptive analytic tables were created as examples using the *Ethical Decision Making* competency (see Tables 5–7). The full results tables are in Chapter 6 (Section 6.3, Tables 13–15).

The total percentage of participants' recommendations from Matrix 2 (Table 4) was calculated according to each participant group (academics, AMSA executives, QRGP executives, and JCU MBBS graduates). An example of the percentages relevant to the groups is provided in Table 5. Table 6 presents the total percentage of combined participant groups. Although each competency's total percentage results are

shown in Table 5, Table 6 has been produced to uncomplicate the reading of each percentage. Both tables were colour coded to easily identify percentages and themes: 0% to 50% is coded Red, 51% to 84% Orange, and 85% to 100% Green.

Table 7 shows an example of when participants indicated *Ethical Decision Making* was taught in basic medical education at the time of the research (Matrix 1). This includes when the competencies were reinforced or mastered at individual teaching levels. To provide a comparison, Table 7 also presents the participants' recommendations from Matrix 2. These recommendations are presented as natural percentage groupings that occurred between 8% and 45%, 53% and 65%, and 85% and 100%. There were no percentages between 1% and 7%, 46% and 52%, or 64% and 84%. Similarly, this column is colour coded to easily identify percentages: 8% to 45% are coded in Red, 53% to 65% in Orange, and 85% to 100% in Green. The third column identifies the range between the competencies taught compared to when it should be taught.

If leadership competencies were deemed a high priority skill, they were automatically added to the *MedStudentLead* framework. This high priority was determined if 85% to 100% of participants agreed the competency should be taught. Competencies ranked between 53% and 63% were defined as a medium priority skill and considered for the *MedStudentLead* framework. Any competency ranked between 8% and 45% was deemed a low priority skill and not added. *Clinical Reflective Practice* (a medium priority skill at 63%) and *Networking* (a medium priority skill at 53%) were both considered, but only *Clinical Reflective Practice* was added to the *MedStudentLead* framework. This is due to one participant group ranking the competency as a high priority (100%); two groups ranked it as a medium priority to be considered (69% and 82%) and the fourth group ranked it at a low priority (0%). Whereas, for *Networking*, one participant group ranked the competency as a high priority (100%), another group ranked it as a medium priority to be considered (66%) and two groups ranked it in the low priority range (0% and 44%).

**Table 5.**

*Example of Descriptive Analytic Result Table: When Ethical Decision Making Should be Taught (All Participants)*

| Competency | Basic medical education [a] | | | | | Junior doctor (PGY1–3) | | | | | Senior clinician (PGY4+) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Academics | AMSA exec | QRGP exec | JCU MBBS graduates | Total | Academics | AMSA exec | QRGP exec | JCU MBBS graduates | Total | Academics | AMSA exec | QRGP exec | JCU MBBS graduates | Total |
| | *n* = 16 | *n* = 4 | *n* = 5 | *n* = 176 | *N* = 201 | *n* = 16 | *n* = 4 | *n* = 5 | *n* = 176 | *N* = 201 | *n* = 16 | *n* = 4 | *n* = 5 | *n* = 176 | *N* = 201 |
| ***Leads Self*** leadership domain | | | | | | | | | | | | | | | |
| Ethical Decision Making | 69% | 100% | 100% | 95% | 91% | 75% | 100% | 100% | 77% | 88% | 38% | 50% | 100% | 64% | 63% |

*Note*. This table provides an example of the full results presented in Table 13 (Chapter 6, Section 6.3). Colour coded to easily identify percentages: 0%–50% = Red, 51%–84% = Orange, 85%–100% = Green. PGY1–3 = Postgraduates in their first to third year. PGY+4 = Postgraduates in their fourth year or more. AMSA exec = Australian Medical Student Association executives. QRGP exec= Queensland Rural Generalist Pathway executives. JCU MBBS graduates = James Cook University Bachelor of Medicine and Bachelor of Surgery Graduates.

[a] Basic medical education is a medical program with a degree qualification that permits the holder to seek general registration as a medical practitioner.

**Table 6.**

*Example of Descriptive Analytic Result Table: Should be Taught Totals*

| Leadership domain | Competency | Basic medical education [a] *N* = 201 | Junior doctor (PGY1–3) *N* = 201 | Senior clinician (PGY4+) *N* = 201 |
|---|---|---|---|---|
| Leads Self | Ethical Decision Making | 91% | 88% | 63% |

*Note*. This table provides an example of the full results presented in Table 14 (Chapter 6, Section 6.3). Colour coded to easily identify themes: 0%–50% = Red, 51%–84% = Orange, 85%–100% = Green. PGY1–3 = Postgraduates in their first to third year. PGY+4 = Postgraduates in their fourth year or more.

[a] Basic medical education is a medical program with a degree qualification that permits the holder to seek general registration as a medical practitioner.

**Table 7.**

*Example of Descriptive Analytic Result Table: Comparison of Totals From Taught and Should be Taught in a Medical Program*

| Leadership domain | Competency | Taught in basic medical education [ab] | Should be taught in basic medical education | Range (gap) between what is taught and what should be taught |
|---|---|---|---|---|
| | | Academics and deans | All participants | |
| | | *N* = 16 | *N* = 201 | |
| Leads Self | Ethical Decision Making | 13 (81%) | 91% | +10% |

*Note.* This table provides an example of the full results presented in Table 15 (Chapter 6, Section 6.3). Colour coded by natural percentage groups: Red (0%–44%) = Low priority (not relevant to medical school level), Orange (53%–63%) = A medium priority skill (a skill to be considered), and Green (85%–100%) = A high priority skill (a core skill).

[a] With a self-reported response of reinforced or mastered.

[b] Basic medical education is a medical program with a degree qualification that permits the holder to seek general registration as a medical practitioner.

#### 3.2.5.3. Validation of the *MedStudentLead* Framework.

***3.2.5.3.1. Member Checking from Qualitative Participant Groups.*** To explore the credibility and usability of the *MedStudentLead* framework, member checking of an early framework draft occurred with two QRGP executives. This draft had all competencies written with most assessment items. It was viewed in its entirety and fully discussed during an online Zoom meeting. Both executives were positive about the framework's content and usability, and there were no changes recommended. The meeting was recorded, and the recording uploaded to NVivo.

As mentioned in Section 3.2.4.2, much effort was made to contact the 2020 AMSA participants. With no response, the *MedStudentLead* framework was shared electronically with an AMSA 2023 president, but unfortunately, no feedback was received. This has been added to the limitation section in Chapter 8.

End-User Feedback. An end user is a person who ultimately uses or intends to use a product. The main *MedStudentLead* framework end users are academics in medical schools and medical students. End-user feedback was used to confirm the usability of the *MedStudentLead* framework within a medical school setting.

In June 2023, the *MedStudentLead* framework was published on its own website (www.medstudentlead.com.au). At that time, it was titled *Proposed Medical Student Leadership Framework* (Appendix I). In late June 2023, the *Proposed Medical Student Leadership Framework* was presented twice (each with 10 minutes to present and five minutes for question time) at the Australian and New Zealand Association for Health Professional Educators (ANZAHPE) conference (Appendix I). In both presentations, the last slide presented two options to provide feedback: either feedback on the website or face-to-face at the conference, with the *MedStudentLead* framework open for feedback until Friday 21 July 2023.

During question time for both presentations, multiple attendees verbally provided strong acknowledgement for this *MedStudentLead* framework. After the first presentation, one attendee stated he "was part of making the original UK Leadership framework, which I do not like. I prefer this

framework and would be happy to provide feedback." He also mentioned that medical students need to learn to be humble, and this *MedStudentLead* framework would help them to do so. After the second presentation, one attendee stated she was "happy the framework is open for feedback and I would like to be part of the conversation." Moreover, a presenter mentioned the *MedStudentLead* framework later at the conference during his presentation. He strongly acknowledged the work involved in the development of the *MedStudentLead* framework, advised that leadership skills training for students was important, and mentioned he was looking forward to the *MedStudentLead* framework being published.

At any time when the *MedStudentLead* framework was discussed during the conference, the person's details were collected to develop a future collaboration and to receive maximum feedback. An email was then sent to each conference contact. Emails were also sent to the medical academics and deans who agreed to further communication at the time of completing the Phase 1 Leadership Curricula and Assessment in Australia and New Zealand Medical Schools questionnaire. A copy of the *MedStudentLead* framework was emailed to the 2023 AMSA president to provide end-user feedback from a medical student usability perspective, as well as feedback from an AMSA organisation perspective (see Table 8 below, and Table 1 in Section 3.2.1).

**Table 8.**

*Proposed MedStudentLead Framework End-User Feedback*

| Type of communication | Timeline | Subject | Sample size | Response |
|---|---|---|---|---|
| Face-to-face at Australian and New Zealand Association for Health Professional Educators Conference (ANZAHPE 2023) | 26–29 June 2023 | Academics who teach professionalism and leadership, or who complete research on the topic | 6 academics, with 3 (50%) sets of feedback and 1 (16%) referral to another academic. Total response rate:66% | Detailed feedback provided. Each with strong acknowledgement of the importance of the *MedStudentLead* framework |
| Email to external medical academics from Phase 1 | 11 July 2023 | Academics and deans who agreed to further communication at the time of completing the Phase 1 questionnaire | 8 academics, with 0 (0%) feedback and 2 (25%) referrals to other academics. Total response rate: 25% | Two referrals to other academics as per below, which indicate the importance and usability of the *MedStudentLead* framework |
| Email correspondence from external academics who had the framework forwarded to them by an academic or medical dean (after the above emails were sent) | 19–27 July 2023 | Academics who teach professionalism and leadership | 2 academics, with 1 (50%) request to talk, and 1 (50%) request to provide the drafted framework to second-year medical students | Academic 1: did not attend the arranged meeting<br>Academic 2: agreed to provide a draft of the *MedStudentLead* framework to the second-year medical students for 4 weeks. Indicated the importance of medical students having this type of leadership framework |
| Email correspondence from internal James Cook University (JCU) medical academic | 21 July 2023 | Academic Lead, Clinical Skills | 1 academic | 1 email response with detailed recognition of the importance of the *MedStudentLead* framework |
| Face-to-face meeting | 31 July 2023 | The Australian Medical Student Association (AMSA) president | 1 student | Agreed to review the *MedStudentLead* framework from the AMSA organisation and medical student perspective. Drafted *MedStudentLead* framework was provided; however, no response provided from the AMSA President |

End users who responded with detailed feedback about the *Proposed MedStudentLead Framework* (draft), or requested to use the framework, were from four different medical schools across the three states of Queensland, Western Australia, and New South Wales. There was no prior relationship before meeting the end users at the 2023 ANZAHPE Conference. Each end user was a medical doctor, two were very senior medical academics, and all taught professionalism and leadership at the time.

The end users all gave strong support for how the *MedStudentLead* framework could positively impact medical students and their skills for the future. Below are two written email examples:

> I want to emphasise my strong support for the framework – it is comprehensive and impressive, and I can see how it could have a positive impact upon the skills of our future doctors. (End user two)

> This is a really important framework/document and I can see it being taken up by many institutions to help guide medical student education in relationship to leadership development. (End user four)

***3.2.5.3.2. MedStudentLead Framework Changes Based on End-User Feedback.*** Changes were made based on the end users' feedback on the *MedStudentLead* framework (Table 9). Each change to the *MedStudentLead* framework focused on the design of:

1. specific introduction sections
2. specific competencies
3. additional readings or references
4. teaching and assessment resources
5. tools to guide academics and/or medical students.

**Table 9.**

*Changes to the MedStudentLead Framework Due to End-User Feedback*

| Topic focus | End user | Recommendation | Change made |
|---|---|---|---|
| Specific introduction sections | End user one | "It would be persuasive to say up front e.g. page 1 that these competencies are what stakeholders feel students need." | Whole section of "How was the *MedStudentLead* framework developed" from page 5 moved to page 1 and added into a grey box. |
| | End user two | "Students could consider the framework when observing choices, behaviours and interactions in own personal life to build skills outside of educational and professional setting.<br>Is there a need to label some emotion as negative?<br>Consider explicit differentiation between sympathy/empathy/compassion to highlight empathic distress and benefit of compassion over empathy?<br>Consider changing 'professional identify role and role' to 'professional role and responsibilities or similar, to avoid confusion.' " | Sentence added under how to use competencies as a medical student: "To build skills outside of the educational and professional settings, students can personally use the *MedStudentLead* framework when observing choices, behaviours and interactions."<br>Introduction section of Building Emotional Agility updated with the word 'negative' replaced with 'challenging.'<br>Resilience section of Building Emotional Agility updated. Two sentences added: "Empathic stress is caused by taking in another's pain as our own and causes a strong need to withdraw to protect oneself from these feelings. Thus, developing coping strategies to increase resilience is important to reduce moral injury, empathic distress and burnout."<br>In Section 2.2 Building Relationships with Colleagues, changed to include 'professional role and responsibilities or similar.' |
| | End user three | "Reinforce the purpose of leadership, as it's about the doctor's role in healthcare. Consider broadening this into community." | Two sentences added: "Due to this continuous quality improvement service for the organisation, staff, and most importantly patients, this advocacy extends to communities. Medical leaders are vital in contributing to improving community health and wellbeing outcomes." |
| Specific competencies | End user three | "Care with the partnering concept … maybe this is guiding leadership, empowering the patient." | The start of the second paragraph changed to: "The aim of working in partnership with patients is to empower patients to be part of shared decision making." |

| Topic focus | End user | Recommendation | Change made |
|---|---|---|---|
| Additional readings or references | End user one | "Kwong Chan and Linda Humphreys have done some work on reflective practice." | Added Chan et al[103].as a reference and reading. Added more sentences around critical reflective practice as a leadership skill. |
| Teaching and assessment resources | End user one | "Can we use existing teaching and learning of ethics and professionalism? – 1.2.2 Ethical Decision Making." | Sentence added: "The below teaching and assessment recommendations can be added to the current existing teaching and learning on ethics in medical education." |
| | End user three | "I'd reduce the OSCE [Objective Structured Clinical Examination] comments, design work-based assessment to fit." | Changed Objective Structured Clinical Examination to 'multi-stations assessment tasks.' Many other work-based assessments and reflections made available. |
| Tools to guide academics and/or medical students | | No requests to change this section were provided. | |

Feedback items were recommended by end users and will be added to future versions of the *MedStudentLead* framework (post-PhD). The first item is a tool for students to complete a table of leadership competencies with skill levels ranging from novice to proficient mastery.[104] This is to allow students to select and record their current leadership skill level and review future learnings required.

The remaining recommended changes are focused on resources for staff:

- mock teaching assessment activities (End user one)
- scenarios with various leadership skills, such as conflict resolution, communication skills, and interprofessional competency (End user one)
- staff training opportunities for academic and professional staff regarding their own leadership style and skills in educational sessions (End user two).

There was also an additional recommendation to expand the application of the *MedStudentLead* framework beyond leadership and professionalism to other topic domains. This is to generate an integrated curriculum of leadership teaching within and across the years.

***3.2.5.3.3. Dissemination of MedStudentLead Framework.*** The *MedStudentLead* framework figure and website were created by a hired website designer (See Statement of the Contribution of Others on p. iii). Once the *MedStudentLead* framework and relevant resources were finalised, they were uploaded to the website (www.medstudentlead.com.au). This website was included in each of the below dissemination processes:

- Tweeting about the *MedStudentLead* framework's availability using hashtags of #MedStudentLead, #Medicalstudents, #MedEd, #MedicalEducation, #MedLead, and #LeadershipMatters.
- Posting about the framework on LinkedIn Account.
- Emailing all participants who had agreed to further contact in each research phase.
- Emailing as many authors as possible who were cited in the *MedStudentLead* framework.

### 3.3. Chapter Summary

This chapter described the methodology and philosophy of the multiphase study design, and it provided an overview of the data collection. Each phase was written up separately. As methods are detailed in each published chapter, this chapter only discussed the content validity and member-checking methods for Phase 1 (published) and Phase 2 (submitted for publication). However, the methods for Phase 3 are described in full from the selection of key leadership competencies to validation and dissemination. Each phase describes the testing of content validity. The next chapter has been published and is the first findings chapter, which discusses Phase 1: Leadership Curricula and Assessment in Australian and New Zealand Medical Schools.

# Chapter 4. Phase 1: Leadership Curricula and Assessment in Australia and New Zealand Medical Schools

## 4.1. Introduction

This chapter is the second publication for this study and is published in *BMC Medical Education*. It is the first in-depth study into medical leadership teaching, assessment and evaluation practice in medical degrees in Australia and New Zealand. It examines the findings of the self-administered quantitative questionnaire (*Medical Leadership, Curricula, Assessment and Evaluation*) distributed to the 22 Australasian Medical Schools. It reports the roles and responsibilities of medical leadership teachers, current methods of delivery and opportunities for student feedback, and methods of assessment and the competencies assessed. It examines the self-reported barriers to leadership education, assessment, and evaluation, as well as the support required to integrate or assess leadership in the curriculum. Most importantly, it builds on the limited knowledge regarding basic medical leadership education in Australia.

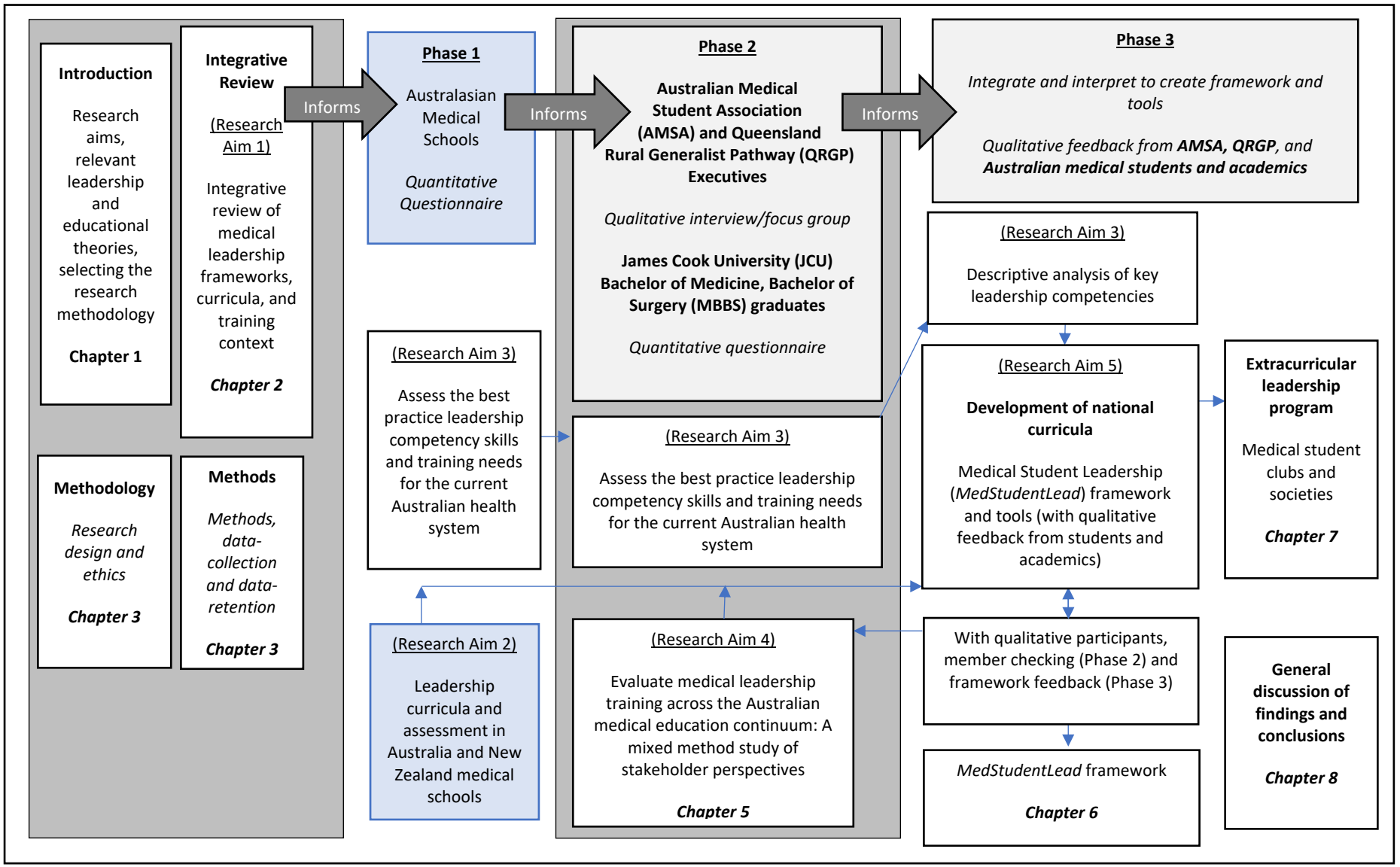
Many of the references are added to this thesis in other chapters, however, the article, survey, and references of this chapter are within the standalone publication. The copy of Figure 1 below provides an overview of this chapter in relation to other chapters in the thesis. Most of the methods of this chapter are found in the article, with the content validity of the *Medical Leadership Curricula, Assessment and Evaluation Survey* found in Chapter 3, Section 3.2.3. This study relates to the following research aim:

> Research Aim 2. Critically evaluate the current leadership teaching and assessment skills across the 22 Australasian medical schools

**Publication Reference**

Ross SJ, Sen Gupta T and Johnson P (2021). Leadership curricular and assessment in Australian and New Zealand Medical Schools. *BMC Medical Education,* 21, Article 28, doi:10.1186/s12909-020-02456-z.

**Copy of Figure 1**. *Overview of This Study*



### 4.2. Summary of the Major Findings of This Chapter

In Australasian medical schools' leadership training is taught in a variety of ways across the degrees and most degrees will be reviewing their leadership training within the next two years. The teaching methods used to deliver medical leadership education are diverse. So, too, are other opportunities outside the curricula for students to learn medical leadership. Less than half of the medical schools evaluate leadership teaching at their school. More than half formally assess medical leadership. In most Australian degrees, competencies taught at Reinforced or Mastered levels provided a well-constructed student understanding of professionalism, which is the basis for a good leader and a good doctor. However, it appears that some of the key leadership competencies are rarely being taught. This includes successfully managing conflict.

Key barriers included: 1) A lack of national curricula and guidelines for teaching, assessment, and evaluations; 2) Lack of knowledge and expertise in how to teach and assess leadership; and 3) Lack of teaching time and timetabling opportunities to teach, assess, and evaluate. Based on these barriers, three recommendations were provided. The first, academics should be supported, nationally and locally, to develop resources and align content. The second, development of a health leadership core curriculum and teaching methods with a leadership development real-world work integrated focus. This would align with other health teaching domains, such as professionalism, ethics, and Indigenous health, as well as most health science disciplines. The third and final requirement includes evidence-based guidelines for teaching medical leadership, with a clear and transparent curriculum, linked to industry and future practice, and appropriately assessed and evaluated.

# Chapter 5. Phase 2: Medical Leadership Training Across the Australian Medical Education Continuum

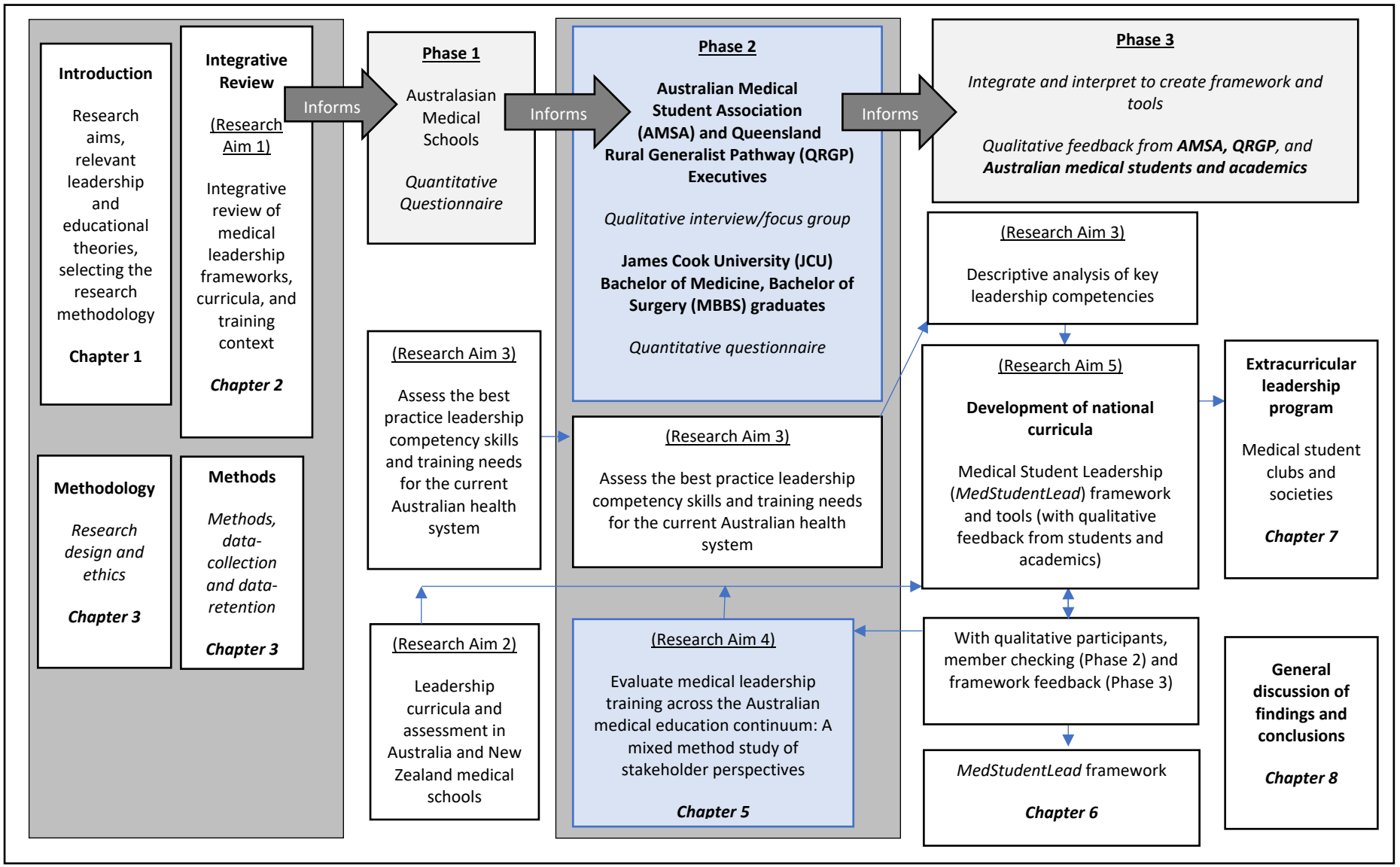
## 5.1. Introduction

This chapter is the third manuscript for this study. It has been submitted to *BMC Medical Education*. It is the first in-depth study into understanding the medical leadership training across the Australian medical education continuum. It examines the findings of the self-administered quantitative questionnaire (*Medical Leadership Survey for Doctors*) distributed to JCU MBBS Graduates PGY4+ (doctors), and the qualitative themes from the interviews / focus group with AMSA and QRGP Executives. It reports the formal and informal leadership experiences and roles, training and assessment in a medical leadership role, formal or informal extracurricular medical leadership, and the influence of role models and how they benefit their mentees. It examines the self-reported barriers to medical leadership training across the medical continuum and recommended changes to medical leadership training. Most importantly, it builds on the limited knowledge regarding leadership learning, assessment, roles, and mentors across the medical continuum in Australia.

Many of the references are added to this thesis in other chapters, however, the article and references of this chapter are within the standalone publication. See a copy of Figure 1 below for an overview of the chapter in relation to other chapters in this thesis. Most of the methods of this chapter are found in the article, with the content validity of the Medical Leadership Questionnaire for Doctors found in Chapter 3, Section 3.2.4. This study relates to the following research aim:

> Research Aim 4. Determine the leadership training needs for the best practice in the Australian health system as informed by academic leads and/or College Deans, medical student executives, graduates, and specialist leadership trainers.

**Copy of Figure 1.** *Overview of This Study*



**Manuscript Reference**

Ross SJ, Sen Gupta T, Johnson PJ. Medical leadership training across the Australian medical education continuum: A mixed methods study of stakeholder perspectives. Submitted manuscript. Submitted to *BMC Med Educ* December 4, 2023.

*See Appendix G.*

### 5.2. Summary of the Major Findings of This Chapter

This is the first in-depth study into the factors and experiences of JCU medicine graduates (PGY4+), Australian medical student leaders (AMSA executive), and medical leadership trainers (QRGP executive) regarding the state of leadership training across the medical continuum.

Key findings in practice from JCU Medicine Graduates are as follows:

1. Almost half of graduates (86, 42%) self-identified as never worked in a medical leadership role. Specialists were significantly more likely to experience a medical leadership role ($p$ = <.001) compared to junior doctors, specialists in training, and general practitioners ($n$ =196).
2. Almost half of graduates (77, 47%) advised they had formal leadership training, and 61 (37%) selected on-the-job and formal leadership training Almost a sixth of graduates 22 (13%) self-identified they had no formal leadership training ($n$ =164).
3. Less than half of specialists' (22, 44%) complete formal leadership training at their specialist College. Specialists are also significantly more likely (almost a third of specialists) to self-fund generic formal leadership training ($p$ = 0.018) compared to junior doctors, specialists in training, and general practitioners ($n$ =159).
4. General Practitioners were significantly more likely to undertake extra-curricular formal leadership training while at medical school ($p$ = <.001) and had a strong trend to undertake formal leadership training in the medical school curricula ($p$ = 0.052).
5. Graduates working in regional, rural and remote settings (MM2-7) compared to working metropolitan (MM1) settings were significantly more likely to report undertaking 'formal leadership training in the medical school curriculum' ($p$ = 0.009) ($n$ =163).

Key findings of the content analysis of all participants (QRGP executive, AMSA executive, and JCU Medical Graduates) showed the impact of effective role models and mentors. Most participants identified that when effective mentoring was received, then leadership values, skills and knowledge were learned. Some participants described how this produced actual behaviour change to increase their own mentoring and update their own leadership style. In comparison, other participants described negative behaviours they had experienced or observed and are consciously avoiding using that the same behaviour.

Various participant recommendations for teaching medical leadership at each level across the medical education continuum were also described. So, too were many key barriers described for clinical leadership training. Below are the six overarching barrier themes:

1. workforce barriers
2. time barriers
3. little access to formal leadership training
4. relevance to current practice
5. financial cost of training
6. leadership curricula requirements.

Overall study recommendations include teacher training relevant to real-world practice and required leadership skills set for each level across the medical continuum. Moreover, to have trained role models to mentor training at each level. Transformational leadership training recommendations were provided for these role models and mentors.

# Chapter 6. Phase 3: Development of the *MedStudentLead* Framework

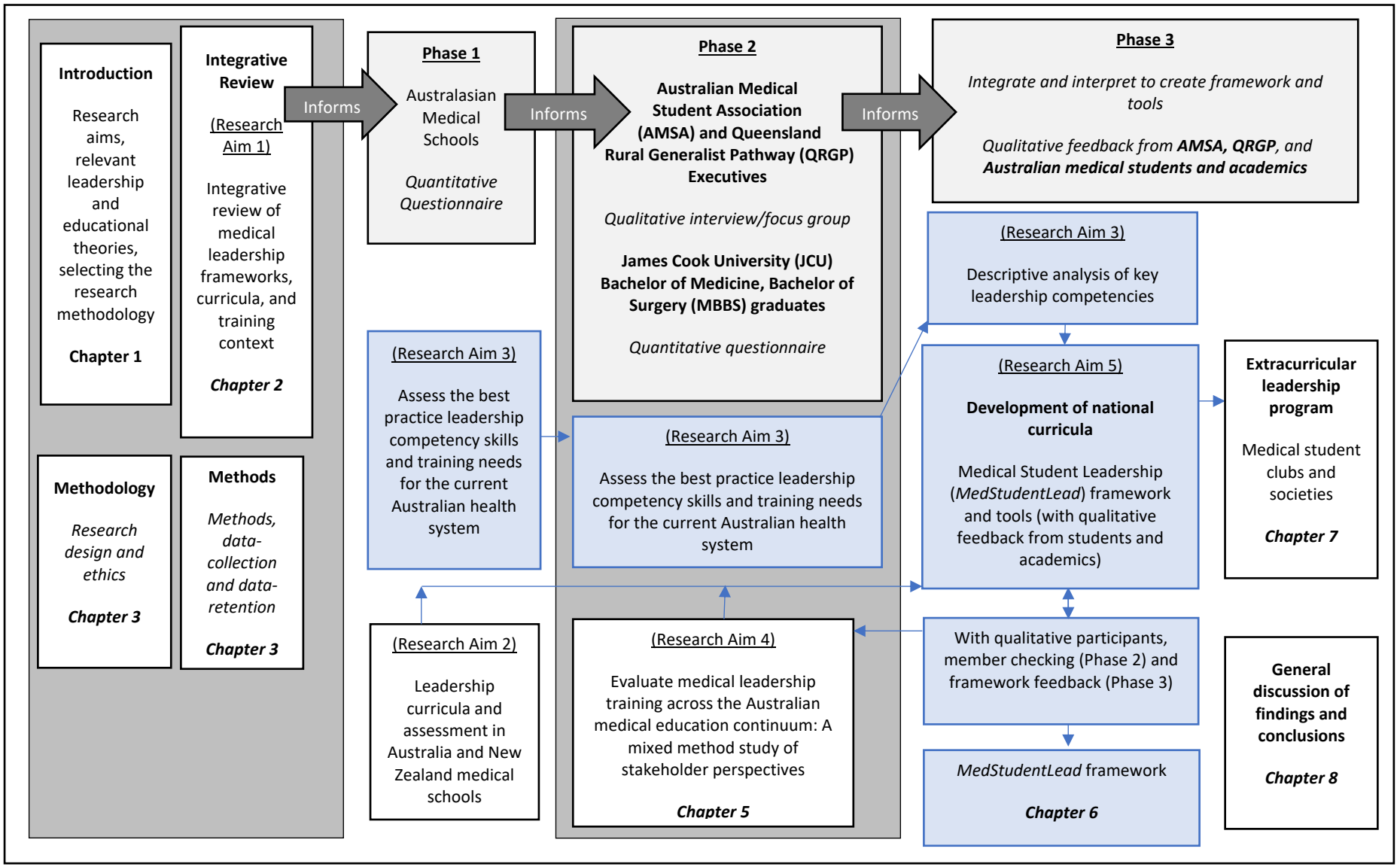
## 6.1. Introduction

Chapter 6 describes the third phase of this multiphase study.[85] This chapter describes the design and development of the first Australian *MedStudentLead* framework, a national medical leadership competency framework for Australian medical schools. The *MedStudentLead* framework is designed for medical schools that provide qualifications permitting each graduate to seek general registration as a medical practitioner; it does not refer to specialist postgraduate training. The methods section of the *MedStudentLead* framework is discussed in Chapter 3, Section 3.2.5. Portions of the written methods are duplicated in the *MedStudentLead* framework document. Details regarding where the *MedStudentLead* framework is published can be found in Section 6.5. A copy of Figure 1 is also presented below for an overview of Chapter 6 in relation to other chapters in the thesis.

## 6.2. Background

As detailed in Chapter 1 and Chapter 2, the concept of medical leadership teaching for students in primary medical education programs has been discussed for more than 20 years.[17,18] Phase 1 of this research (Chapter 4) produced and published the first snapshot of (the current) medical leadership training in Australasian medical schools. Phase 2 of this research (Chapter 5) explored the current situation in Australia with respect to medical leadership training across the medical education continuum. As discussed in the methods chapter (Chapter 3) each participant from Phases 1 and 2 completed Matrix 2, "key leadership competencies that *should be taught* in the medical education continuum." The medical leadership core skills (and review of skills to be considered) from the *should be taught* category, plus the overall recommendations from Phases 1 and 2, provided the core competencies for the *MedStudentLead* framework.

**Copy of Figure 1.** *Overview of This Study*



Key context, usability, and content challenges and responses to creating a useful leadership framework for medical students and academics are discussed in Table 15 (below). As most challenges in this study involved the complex context of Australian medical student training, in-depth details pertaining to these contexts are explored. Further, the 2004 Dreyfus model detailing stages of adult acquisition[102] is discussed to explore why medical leadership for an advanced medical student learner (graduating student) is equal to the Dreyfus competent stage of skill learning.

### *6.2.1. The Australian Medical Student Training Context*

Australia is a large country with shared responsibility for regulating the health system between the Commonwealth of Australia (a federation of six states and two-self-governing territories) and state or territory governments. Local governments play a role in community-based or home care services with funding from the state or territory.[105] Funding for training health professionals is the Commonwealth's responsibility through Commonwealth supported places (domestic students only) where the government pays part of a student's university study fee.[106] In 2023, 24 universities offered professional entry-level medical education, training, and research in Australia and New Zealand.[107] Six are graduate entry only and require a tertiary graduate degree to enrol, nine are direct entry from secondary school and do not require a prior tertiary graduate degree to enrol, seven are mixed with the student's entry dependent on whether they are straight from secondary education or have completed a previous tertiary graduate degree, and two offer a provisional entry path to graduate medical programs in other universities.[106] Of these medical schools, one degree is three years long but most are four years, with a handful each of five- or six-year degrees. The duration of years increases due to medical students' entry-level qualifications. For example, medical programs with tertiary graduate entry have fewer years. In comparison, for medical practitioner (clinician) specialty training, there are currently 25 approved programs in which a medical practitioner can study to receive the qualification of a specialist.[108]

The AMC is the accreditation body for medical schools and specialty programs of study.[4] At the time of accreditation, medical education and speciality training providers demonstrate how the curriculum or program ensures each graduate meets their teaching outcomes, including leadership

skills training.[4] In 2023, there is still no national strategy or set of leadership learning outcomes or educational resources provided. Therefore, the amount of leadership training a medical student or clinician should have, has never been defined in Australia until this research.

### *6.2.2. The Dreyfus Model of Adult Skill Acquisition*

Skill acquisition literature was greatly influenced by Stuart Dreyfus and Hubert Dreyfus in 1980.[109] The original five stages of the Dreyfus model of adult skill acquisition (Dreyfus model) were: 1) novice, 2) advanced beginner, 3) competent, 4) proficient, and 5) master. Benner in 1984[1110] investigated skills acquisition related to clinical nursing practice. At that time, Benner[108] applied the five stages of the original Dreyfus model to nursing education and identified a newly qualified nurse as between the skill levels of advanced beginner and competent. This meant they had relied on protocol and/or able to provide independent care and assume greater responsibility.

**Table 10.**

*Benner's Stages Adapted From the Dreyfus Model of Adult Skill Acquisition to Nursing Education*

| Novice | Advanced beginner | Competent | Proficient | Master |
|---|---|---|---|---|
| A student nurse acquiring knowledge and skills | Reliance on protocols / guidelines | Able to provide independent care, and assume greater responsibility | Able to recognise and respond to rapidly changing clinical situations | Intuitive management of complex cases |

*Note*. This table has been adapted from Benner's application of the Dreyfus model.[108]

In 2004, the five levels of adult skill acquisition were updated and agreed upon, and the Dreyfus model was re-published.[104] This current five-stage model ranges from novice to expert: 1) novice, 2) advanced beginner, 3) competent, 4) proficient, and 5) expert. The fifth stage was changed from master to expert, and more detailed information was provided on each adult skill acquisition to contain components, perspective, decision, and commitments (Table 11). Although the model was published by Stuart Dreyfus in 2004, the abstract advises it is a summary of the original version by both Stuart and Hubert Dreyfus.

**Table 11.**

*Dreyfus' Five Stages of Skills Acquisition*

| Skill level | Novice | Advanced beginner | Competent | Proficient | Expert |
|---|---|---|---|---|---|
| Components | Context free | Context free and situational | Context free and situational | Context free and situational | Context free and situational |
| Perspective | None | None | Chosen | Experienced | Experienced |
| Decision | Analytic | Analytic | Analytic | Analytic | Intuitive |
| Commitment | Detached | Detached | Detached understanding and deciding; involved outcome | Involved understanding; detached deciding | Involved |

*Note*. This table has been adapted from the updated Dreyfus model.[102]

Over the years, the Dreyfus model has been the subject of robust academic discussion and research in the fields of teaching and learning, with topics including nursing skills acquisition, clinical problem solving in medicine, and leadership skills development.[111-113] Similar to other well-used models, there are criticisms and debate. Most appear to be due to model rigidity, with a focus on nurses' rather than clinicians' skill development. Pena in 2010[114] reviewed the literature and explored this debate. Pena's main outcomes identified there were no explanations for the everyday experience of learning[115]; there was an absence of social structure or social knowledge[116-118]; and there was a lack of objective knowledge for qualifications, or a definition for expertise or intuition.[119-121] For clinical medicine, the Dreyfus model appears to be accepted widely for practical wisdom[122] and medical competencies,[123,124] though there appears to be debate about the learning of clinical skills and problem solving.[125-127]

In 2013, the American Accreditation Council for Graduate Medical Education[128] created a revised set of internal medicine milestones deliberately structured on the Dreyfus model. Whereas in Australasia, the Royal Australasian College of Medical Administrators (RACMA) in their RACMA *Medical Leadership and Management* curriculum framework,[129] mapped assessment to a modified version of the Dreyfus model. Table 12 outlines the progression of a RACMA candidate using RACMA's Modified Dreyfus Model of Skills Acquisition: Novice-to-Expert Scale. RACMA

identified that at a minimum, by the time candidates take their oral exam, newly qualified medical administrators are between the skills levels of Competent and Proficient.

**Table 12.**

*RACMA's Modified Dreyfus Model of Skills Acquisition: Novice-to-Expert Scale*

| RACMA's scale items | Novice | Advanced beginner | Competent | Proficient | Expert |
|---|---|---|---|---|---|
| Knowledge | Minimal knowledge without connection to practice | Working knowledge of fundamental practice | Good working and background knowledge of area of practice | Has depth of understanding of discipline and area of practice | Authoritative knowledge of discipline and across area of practice |
| Standard of work | Requires close supervision | Completes straightforward tasks to acceptable standard | Mostly acceptable, though may lack refinement | Accepted standard achieved regularly | Excellence achieved with ease |
| Autonomy | Requires close supervision | Can use own judgement, but supervision needed for overall task | Able to achieve most tasks using own judgement | Able to take responsibility for own work | Able to take responsibility for going beyond existing standards |
| Coping with complexity | Little understanding of dealing with complexity | Partial resolution of complex situations | Coped with deliberate analysis and planning | Deals with complex situations more confidently | Holistic grasp of complex situations, |
| Perception of context | Perceives actions in isolation | Sees actions as stages | Sees actions as stages of longer-term goals | Sees overall actions and | Sees overall actions and alternative approaches |

*Note*. This table has been adapted from RACMA's *Medical Leadership and Management* curriculum.[127]

Due to the diversity of medical programs in Australia, it is recognised that medical students may be at a different level when they start leadership skills development. Some medical programs are for undergraduates with first-year medical students directly from secondary school, and others are graduate programs with first-year students holding an accredited tertiary degree. Therefore, experience will play a part in determining what Dreyfus model stage students will start at. This is the same for medical students when they graduate. Medical students in Australia are always supervised and they are not given responsibility for patient's health outcomes or staff supervision. When they graduate, they may have slightly different levels of leadership skills; however, their level of

leadership practice is limited in healthcare. Consequently, by using RACMA's adapted Modified Dreyfus Model of Skills Acquisition: Novice-to-Expert Scale[129] (above), newly qualified medical students are (at a minimum) between the Dreyfus skill levels of competent and proficient.

### 6.3. Results

During Phase 1, a sample of 16 medical academics and deans from 16 of 22 (73%) medical programs completed the Australian Medical Schools Leadership Curricula, Assessment and Evaluation Survey (Chapter 4). This was the only participant group that completed two matrices. As discussed in Chapter 3 (Section 3.2.5.1) Matrix 1 is called "key medical leadership competencies *taught* in the medical program curricula" (individual teaching level selection when competency is introduced, reinforced, or mastered), and Matrix 2 is called "key leadership competencies that *should be taught* in the medical education continuum" (allowing multiple selections between medical school, junior doctor, and senior clinician).

During Phase 2, Matrix 2 was completed by an additional 185 respondents. With the 16 collected during Phase 1, this made a total of 201 completed matrices. Phase 2 involved:

- Two hundred and six of 610 (34%) eligible JCU medical graduates completed a Medical Leadership Survey for Doctors (see Appendix E). Matrix 2 was completed by 176 respondents (86%).
- Four of four (100%) AMSA executives completed Matrix 2 during their individual interviews.
- One completed Matrix 2, approved by all five (100%) QRGP executives, was provided after the focus group. This matrix has been counted as five separate respondents.

As discussed in Chapter 3 (Section 3.2.5.2) Table 13 shows a snapshot of key leadership competencies each participant thought *should be taught* in the medical education continuum from basic medical education to junior doctor and senior clinician. Table 14 presents the total percentage columns from Table 13. Across the continuum from medical student to senior clinician, the data show a distinct difference where participants believe leadership *should be taught*. Competencies ranked the

highest for teaching in a medical program (above 85%) were in the leadership domain *Lead Self*, for junior doctors they were in the domains *Engages Others* and *Drives Innovation*, and for senior clinicians they were in domains *Drives Innovation* and *Shapes Systems*.

*Successfully Managing Conflict* is the only leadership competency ranked above 85% across the medical education continuum. Competencies that ranked above 85% and are identical for teaching a medical student and a junior doctor are *Ethical Decision Making*, *Communication*, *Interprofessional Teamwork*, *Critical Thinking and Decision Making*, *Evidence-Based Practice and Use*, and *Successfully Managing Conflict*. For junior doctors and senior clinicians, the competencies that ranked above 85% are *Successfully Managing Conflict* and *Building Positive Workplace Culture*.

**Table 13.**

*Descriptive Analysis of Reported "Key Leadership Competencies Should be Taught in the Medical Education Continuum"*

| Competency | Basic medical education [a] | | | | | Junior doctor (PGY1–3) | | | | | Senior clinician (PGY4+) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Academics | AMSA exec | QRGP exec | JCU MBBS graduates | Total | Academics | AMSA exec | QRGP exec | JCU MBBS graduates | Total | Academics | AMSA exec | QRGP exec | JCU MBBS graduates | Total |
| | *n* = 16 | *n* = 4 | *n* = 5 | *n* = 176 | *N* = 201 | *n* = 16 | *n* = 4 | *n* = 5 | *n* = 176 | *N* = 201 | *n* = 16 | *n* = 4 | *n* = 5 | *n* = 176 | *N* = 201 |
| ***Leads Self*** leadership domain | | | | | | | | | | | | | | | |
| Ethical decision making | 69% | 100% | 100% | 95% | 91% | 75% | 100% | 100% | 77% | 88% | 38% | 50% | 100% | 64% | 63% |
| Self-management | 75% | 100% | 100% | 93% | 92% | 75% | 75% | 100% | 81% | 83% | 31% | 25% | 100% | 56% | 53% |
| Emotional intelligence and self-awareness | 75% | 100% | 100% | 92% | 92% | 69% | 25% | 100% | 78% | 68% | 38% | 25% | 100% | 63% | 57% |
| Exploring values | 69% | 100% | 100% | 91% | 90% | 75% | 50% | 100% | 70% | 74% | 31% | 50% | 100% | 54% | 59% |
| Critical reflective practice | 69% | 100% | 0% | 82% | 63% | 81% | 75% | 100% | 84% | 85% | 31% | 75% | 100% | 74% | 70% |
| ***Engages Others*** leadership domain | | | | | | | | | | | | | | | |
| Communication | 81% | 75% | 100% | 98% | 89% | 88% | 100% | 100% | 78% | 92% | 63% | 50% | 100% | 69% | 71% |
| Interprofessional teamwork | 75% | 75% | 100% | 89% | 85% | 88% | 100% | 100% | 82% | 93% | 50% | 50% | 100% | 70% | 68% |
| Partnering with stakeholders | 25% | 25% | 0% | 44% | 24% | 75% | 75% | 100% | 71% | 80% | 69% | 100% | 100% | 82% | 88% |
| Power in organisations | 44% | 50% | 0% | 44% | 35% | 88% | 100% | 100% | 72% | 90% | 63% | 75% | 100% | 80% | 80% |
| Networking | 44% | 100% | 0% | 66% | 53% | 81% | 100% | 100% | 80% | 90% | 50% | 100% | 100% | 72% | 81% |
| ***Achieves Outcomes*** leadership domain | | | | | | | | | | | | | | | |
| Critical thinking and decision making | 75% | 100% | 100% | 94% | 92% | 88% | 100% | 100% | 85% | 93% | 56% | 50% | 100% | 69% | 69% |
| Managing staff | 25% | 25% | 0% | 26% | 19% | 56% | 100% | 100% | 64% | 80% | 75% | 100% | 100% | 90% | 91% |

| Competency | Basic medical education [a] | | | | | Junior doctor (PGY1–3) | | | | | Senior clinician (PGY4+) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Academics | AMSA exec | QRGP exec | JCU MBBS graduates | Total | Academics | AMSA exec | QRGP exec | JCU MBBS graduates | Total | Academics | AMSA exec | QRGP exec | JCU MBBS graduates | Total |
| | *n* = 16 | *n* = 4 | *n* = 5 | *n* = 176 | *N* = 201 | *n* = 16 | *n* = 4 | *n* = 5 | *n* = 176 | *N* = 201 | *n* = 16 | *n* = 4 | *n* = 5 | *n* = 176 | *N* = 201 |
| Project management | 38% | 50% | 0% | 35% | 31% | 75% | 100% | 100% | 55% | 83% | 63% | 75% | 100% | 85% | 81% |
| Financial management | 31% | 0% | 0% | 49% | 20% | 56% | 100% | 100% | 65% | 80% | 69% | 100% | 100% | 82% | 88% |
| Negotiation | 56% | 50% | 0% | 60% | 42% | 75% | 100% | 100% | 80% | 89% | 69% | 75% | 100% | 82% | 82% |
| ***Drives Innovation*** leadership domain | | | | | | | | | | | | | | | |
| Creativity and visioning | 38% | 50% | 0% | 71% | 40% | 63% | 50% | 100% | 66% | 70% | 69% | 50% | 100% | 68% | 72% |
| Evidence-based practice and use | 81% | 75% | 100% | 98% | 89% | 81% | 100% | 100% | 87% | 92% | 63% | 75% | 100% | 73% | 78% |
| Successfully managing conflict | 81% | 100% | 100% | 82% | 91% | 61% | 100% | 100% | 88% | 87% | 63% | 100% | 100% | 81% | 86% |
| Building positive workplace culture | 63% | 50% | 0% | 68% | 45% | 88% | 75% | 100% | 86% | 87% | 69% | 100% | 100% | 85% | 89% |
| Leadership and management of change | 69% | 50% | 0% | 50% | 42% | 63% | 75% | 100% | 74% | 78% | 63% | 75% | 100% | 88% | 82% |
| Quality and service improvement | 81% | 25% | 0% | 50% | 39% | 69% | 75% | 100% | 79% | 81% | 63% | 100% | 100% | 88% | 88% |
| ***Shapes Systems*** leadership domain | | | | | | | | | | | | | | | |
| Workforce planning | 25% | 0% | 0% | 19% | 11% | 31% | 75% | 0% | 46% | 38% | 69% | 100% | 100% | 90% | 90% |
| Strategic planning | 31% | 50% | 0% | 18% | 25% | 50% | 100% | 0% | 44% | 49% | 75% | 75% | 100% | 90% | 85% |
| Health service planning | 19% | 25% | 0% | 19% | 16% | 63% | 100% | 0% | 43% | 52% | 69% | 100% | 100% | 90% | 90% |

*Note*. Colour codes are used to easily identify percentages: 0%–50% = Red, 51%–84% = Orange, and 85%–100% = Green. PGY1–3 = Postgraduates in their first to third year. PGY+4 = Postgraduates in their fourth year or more. AMSA exec = Australian Medical Student Association executives. QRGP exec = Queensland Rural Generalist Pathway executives. JCU MBBS graduates = James Cook University Bachelor of Medicine and Bachelor of Surgery Graduates.

[a] Basic medical education is a medical program with a degree qualification that permits the holder to seek general registration as a medical practitioner.

**Table 14.**

*Total Descriptive Analysis of Reported "Key Leadership Competencies Should be Taught in the Medical Education Continuum"*

| Leadership Domain | Competencies | Basic medical education [a] *N* = 201 | Junior doctor (PGY1–3) *N* = 201 | Senior clinician (PGY4+) *N* = 201 |
|---|---|---|---|---|
| Leads Self | Ethical decision making | 91% | 88% | 63% |
| | Self-management | 92% | 83% | 53% |
| | Emotional intelligence and self-awareness | 92% | 68% | 57% |
| | Exploring values | 90% | 74% | 59% |
| | Critical reflective practice | 63% | 85% | 70% |
| Engages Others | Communication | 89% | 92% | 71% |
| | Interprofessional teamwork | 85% | 93% | 68% |
| | Partnering with stakeholders | 24% | 80% | 88% |
| | Power in organisations | 35% | 90% | 80% |
| | Networking | 53% | 90% | 81% |
| Achieves Outcomes | Critical thinking and decision making | 92% | 93% | 69% |
| | Managing staff | 19% | 80% | 91% |
| | Project management | 31% | 83% | 81% |
| | Financial management | 20% | 80% | 88% |
| | Negotiation | 42% | 89% | 82% |
| Drives Innovation | Creativity and visioning | 40% | 70% | 72% |
| | Evidence-based practice and use | 89% | 92% | 78% |
| | Successfully managing conflict | 91% | 87% | 86% |
| | Building positive workplace culture | 45% | 87% | 89% |
| | Leadership and management of change | 42% | 78% | 82% |
| | Quality and service improvement | 39% | 81% | 88% |

| Leadership Domain | Competencies | Basic medical education [a] *N* = 201 | Junior doctor (PGY1–3) *N* = 201 | Senior clinician (PGY4+) *N* = 201 |
|---|---|---|---|---|
| Shapes Systems | Workforce planning | 11% | 38% | 90% |
| | Strategic planning | 25% | 49% | 85% |
| | Health service planning | 16% | 52% | 90% |

*Note*. Colour codes are used to easily identify themes: 0%–50% = Red, 51%–84% = Orange, and 85%–100% = Green. PGY1–3 = Postgraduates in their first to third year. PGY+4 = Postgraduates in their fourth year or more.

[a] Basic medical education is a medical program with a degree qualification that permits the holder to seek general registration as a medical practitioner.

**Table 15.**

*Comparison of Reported Competencies Taught Compared to Competencies that Should be Taught in a Medical Program*

| Leadership domain | Competencies | Taught in basic medical education [a] [b] | Should be taught in basic medical education | Gap between what is taught and what should be taught |
|---|---|---|---|---|
| | | Academics and deans (*N* =16) | All participants (*N* = 201) | |
| Leads Self | Ethical decision making | 13 (81%) | 91% | +10% |
| | Self-management | 13 (81%) | 92% | +11% |
| | Emotional intelligence and self-awareness | 12 (75%) | 92% | +17% |
| | Exploring values | 12 (75%) | 90% | +15% |
| | Critical reflective practice | 15 (94%) | 63% | **–31%** |
| Engages Others | Communication | 16 (100%) | 89% | –11% |
| | Interprofessional teamwork | 12 (75%) | 85% | +10% |
| | Partnering with stakeholders | 8 (50%) | 24% | **–26%** |
| | Power in organisations | 5 (31%) | 35% | +4% |
| | Networking | 4 (25%) | 53% | **+28%** |
| Achieves Outcomes | Critical thinking and decision making | 13 (81%) | 92% | +11+ |
| | Managing staff | 2 (13%) | 19% | +6% |
| | Project management | 3 (20%) [c] | 31% | +11% |
| | Financial management | 0 (0%) [c] | 20% | +20% |
| | Negotiation | 3 (20%) [c] | 42% | +22% |
| Drives Innovation | Creativity and visioning | 5 (33%) | 40% | +7% |
| | Evidence-based practice and use | 16 (100%) | 89% | –11% |
| | Successfully managing conflict | 6 (38%) | 91% | **+53%** |
| | Building positive workplace culture | 9 (56%) | 45% | –11% |
| | Leadership and management of change | 4 (27%) | 42% | +15% |

| Leadership domain | Competencies | Taught in basic medical education [a] [b] | Should be taught in basic medical education | Gap between what is taught and what should be taught |
|---|---|---|---|---|
| | | Academics and deans (*N* =16) | All participants (*N* = 201) | |
| | Quality and service improvement | 10 (67%) [c] | 39% | **–28%** |
| Shapes Systems | Workforce planning | 1 (8%) [d] | 11% | +3% |
| | Strategic planning | 1 (8%) [d] | 25% | +17% |
| | Health service planning | 1 (8%) [d] | 16% | +8% |

*Note*. Gap percentages are formatted in bold to indicate an increase or decrease in relevance by 25%. Colour coded by natural percentage groups: Red (0%–44%) = Low priority (not relevant to medical school level), Orange (53%–63%) = A medium priority skill (a skill to be considered), and Green (85%–100%) = A high priority skill (a core skill).

[a] With a self-reported response of reinforced or mastered. [b] Basic medical education is a medical program with a degree qualification that permits the holder to seek general registration as a medical practitioner. [c] Calculated using a total of 13 responses. [d] Calculated using a total of 15 responses (1 removed for a response of "couldn't say").

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Three competencies did not reach the level of 85% for teaching across the medical education continuum. *Project Management* ranked 31% for a medical program, 83% for junior doctors, and 81% for senior clinicians. *Creativity and Visioning* ranked 40% for a medical program, 70% for junior doctors, and 72% for senior clinicians. Finally, *Leadership and Management of Change* ranked 42% for a medical program,78% for junior doctors, and 82% for senior clinicians.

Table 15 provides a comparison of self-reported competencies *taught* compared to *should be taught* in Australasian medical programs. Data column 3 shows the gap between what is *taught* and what *should be taught*—these values are formatted in bold if they increase or decrease by more than 25%. The five leadership competencies with the biggest difference in relevance between what is *taught* and what *should be taught* in a medical program are:

1. *Successfully Managing Conflict* with an increase of 53%. Medical programs teaching the competency are 38%, whereas 91% of all participants believe it should be taught.
2. *Critical Reflective Practice* with a decrease of 31%. Medical programs teaching the competency are 94%, whereas 63% of all participants believe it should be taught.
3. *Networking* with an increase of 28%. Medical programs teaching the competency are 25%, whereas 53% of all participants believe it should be taught.
4. *Quality and Service Improvement* with a decrease of 28%. Medical programs teaching the competency are 67%, whereas 39% of all participants believe it should be taught.
5. *Partnering with Stakeholders* with a decrease of 26%. Medical programs teaching the competency are 50%, whereas 24% of all participants believe it should be taught.

## 6.4. Writing the *MedStudentLead* Framework

### *6.4.1. Introduction*

At the time of analysis and before writing the *MedStudentLead* framework, it was necessary to identify some framework development challenges and responses. Within Table 16 below, key items were identified and categorised under the heading of context, usability, and content. Most of the challenges related to the acceptance of the *MedStudentLead* framework by both Australasian medical

programs and students. To alleviate these challenges, writing and designing the *MedStudentLead* framework was proposed as a response. Actual responses were written once the *MedStudentLead* framework was finalised. The first challenge related to medical students' and doctors' continual changing of roles and experiences, and whether a systematic generic medical leadership education and assessment framework was viable. As most other medical leadership frameworks were designed for medical practice (see Chapter 1, Section 1.3),[1-3] with no Australian leadership framework for medical students, the *MedStudentLead* framework was created.

### *6.4.2. Writing the Framework*

While comparing participants' indications of when competencies were *taught* to when they *should be taught* (Table 15), some high priority competencies were renamed to provide greater understanding for both educators and students. For example, *Self-Management* was changed to *Self-Regulation*, and *Critical Thinking* and *Decision Making* was shortened to *Critical Thinking* as the *MedStudentLead* framework already had an *Ethical Decision-Making* competency. *Interprofessional Teamwork* was also changed to *Collaboration with the Healthcare Team*.

With the integrative review and Phase 1 of this research already written and published,[23,24] the leadership barriers and recommendations from these phases were also compared with Phase 2 (Table 15 above). Two further core competencies were identified as ongoing and required leadership education themes. These themes were added to the *MedStudentLead* framework as 'Patients and Carers at the Centre of Care,' and 'Coaching with Observation and Feedback.' Communication was also split into two separate competencies: *Fundamental Communication Skills*, and *Communication with Patients, Families, and Carers*.

Three key section titles were identified for the *MedStudentLead* framework. These are 1) Developing Self as a Leader, 2) Leadership for Healthcare Collaboration, and 3) Leadership for Innovative Healthcare. These headings were preferred over the *Health LEADS Australia* framework of Lead Self, Lead Others, and Drives Innovation. The *MedStudentLead* framework sections and headings were created based on current transformative education literature on how to support students' development of mental models (their worldview of healthcare).[80,83]

**Table 16.**

*Development of the MedStudentLead Framework: Challenges and Responses*

| Framework considerations | Challenge | Proposed response | Actual response |
|---|---|---|---|
| Context | Continuous change of medical students' and doctors' roles and experiences. Can there be a systematic generic leadership education and assessment framework? | Focus on a medical school framework to start with.<br>Post-PhD: evaluate the framework with medical schools by implementing framework at their schools. | Published the first Australian Medical Student Leadership (*MedStudentLead*) framework for medical students completing a medical degree. |
| | Each medical school in Australia is different with a range of undergraduate, postgraduate, or mixed degrees. The degrees range from 3 to 6 years. Medical leadership teaching requirements will thus be different across each school. The *MedStudentLead* framework will require flexibility in its design. | Provide options for how to use the *MedStudentLead* framework leadership competencies in medical education. Add to existing learning around a leadership topic. Add a competency to strengthen teachings around the AMC graduate outcomes. Evaluate medical school leadership teaching and assessment. Create a standalone leadership subject. | Options are provided for how to use the *MedStudentLead* framework competencies in medical education:<br>• Add example teaching and/or assessment to existing learning of a leadership topic.<br>• Add a competency to strengthen teaching outcomes for the AMC graduate outcome domain: Professionalism and Leadership.[4]<br>Evaluate the medical school leadership teaching and assessment using the Academic Checklist from Section 4. Create a standalone leadership subject for medical students, at a time when students can work in the clinical setting to practise these leadership skills. |
| Usability | Complexities regarding how to allow for breadth and depth in the development of the medical leadership competencies and tools. | The leadership competencies are selected by each participant group: medical school academics and deans, student executives, doctors, and specialist trainers. Each participant group can be positioned at a different stage across the medical education continuum. Develop one tool:<br>1. Academic evaluation spreadsheet for academics to evaluate the leadership competencies in their program. | The leadership competencies are selected by each participant group: medical school academics and deans, student executives, doctors, and specialist trainers. Recommendations from Phases 1 and 2 are also added as competencies. Developed two tools:<br>1. Academic evaluation spreadsheet for academics to evaluate the leadership competencies in their program<br>2. 12 tips to implement an extracurricular leadership program for medical student clubs and societies. |

| | | | |
|---|---|---|---|
| Content | The *MedStudentLead* framework must be developed with transformational leadership, transformative education, and mental model theories. | Each competency written with:<br>• a heading relevant to the competency and type of practice<br>• an introduction<br>• outcomes aligned to Bloom's Taxonomy<br>• readings for both students and academics<br>• teaching and assessment recommendations | Each competency written with a sound understanding of the educational context, and:<br>• a heading relevant to the competency and type of practice<br>• an introduction and definition of the competency<br>• a description of the competency in healthcare<br>• a description of how the competency related to leadership<br>• examples of learning outcomes aligned to Bloom's Taxonomy<br>• readings for both students and academics that are available online<br>• teaching and assessment examples.<br>All readings provided as a hyperlink for reader usability. |
| | Competencies must be developed with teaching and assessment recommendations that are applicable to novice and advanced learners. | Due to the different contexts of the Australian medical schools, a range of leadership teaching and assessment examples are needed. Each example must relate to health and be more instructional for students directly from high school, and more practical for advanced learners. | Use of the 2004 Dreyfus model of adult skill acquisition[104]. A novice learner is equal to Dreyfus' novice stage of skills level, whereas an advanced learner is equal to Dreyfus' competent stage of skill learning.<br>Teaching for a novice learner includes example lectures, guest lecturers, guided activities, small group activities, and workshops. Advanced learner examples include guest lectures, guided reflective activities, lectures, peer teaching opportunities, practical exercises, presentations, small group discussions, and weekly hospital-based clinical tutorials.<br>Assessment for a novice learner includes an example essay, guided reflective assessments, multi-station assessment with clinical cases, practical assessment with simulated patients, and presentations. Advanced learner assessment examples include community-based (placement-based) assessment with feedback, critical reflective assessment, essays, and multi-station assessment with clinical cases. |

Due to the different training contexts of medical schools within Australia (See Section 6.2.1) four options were provided in the *MedStudentLead* framework to guide medical educators' use of the competencies. These include:

1. Add an example of teaching and/or assessment to existing learning of a leadership topic.
2. Add a competency to strengthen teaching outcomes for the AMC graduate outcome domain: Professionalism and Leadership.
3. Evaluate the medical school leadership teaching and assessment using the academic checklist from Section 4 of the framework.
4. Create a standalone leadership subject for medical students at a time when students can work in the clinical setting to practise their leadership skills.

Two options were provided to guide medical students' use of the competencies:

1. Read the competencies, review the readings, and reflect on and practise the leadership skills.
2. Use the checklist from Section 4 (in the framework) to review their leadership skills training at their institution and advocate for leadership skills training if desired.

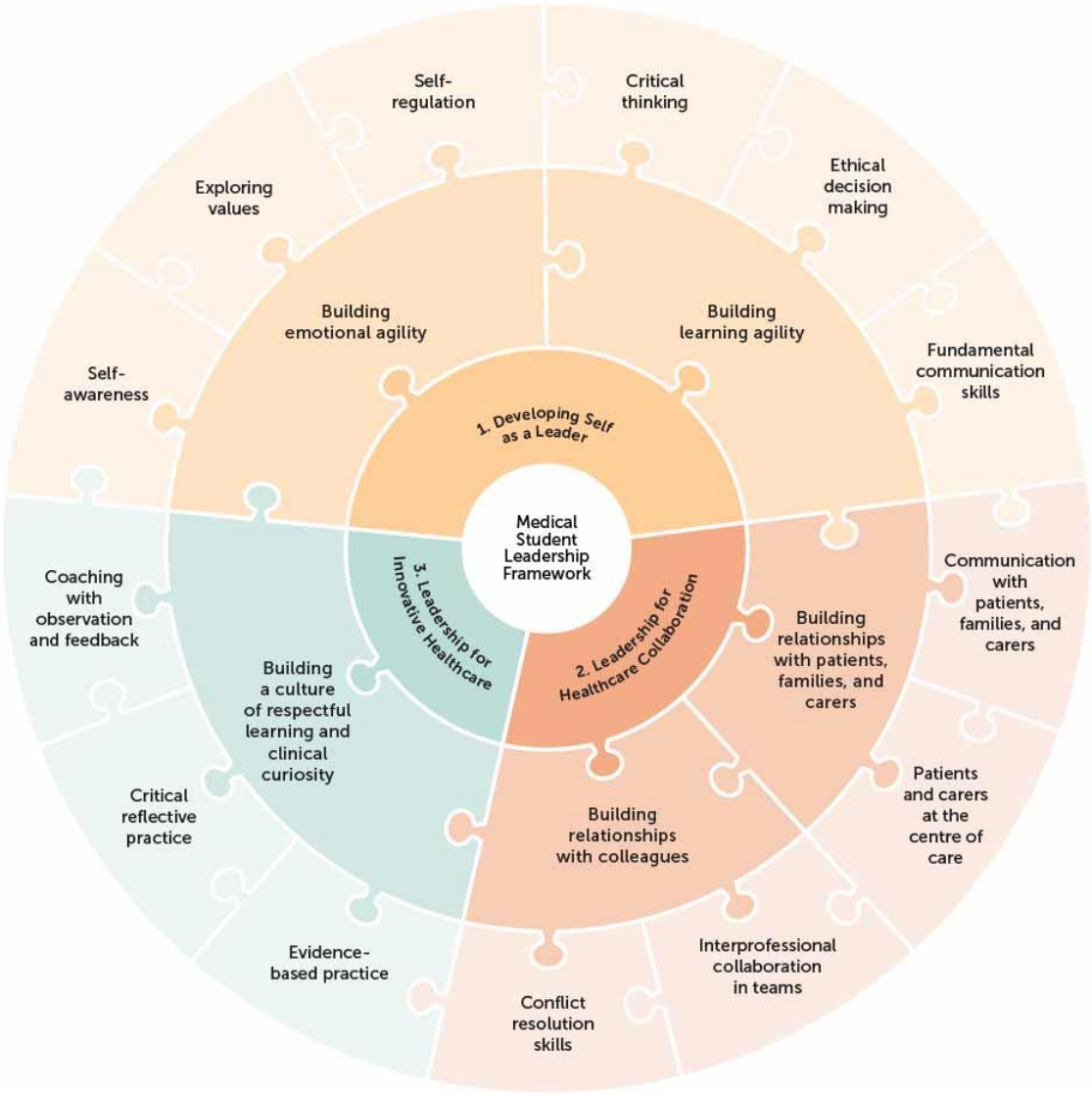
Using the Dreyfus model of adult skill acquisition,[104] (see Section 6.2.2), leadership teaching and assessment examples were split into two skill levels: novice learner and advanced learner. A novice learner is equal to the novice level in Dreyfus' model, whereas an advanced learner is (at a minimum) between the competent and proficient levels of Dreyfus' model.

### 6.5. The *MedStudentLead* Framework

The *MedStudentLead* framework and tools can be found at www.medstudentlead.com.au. The main figure published in the *MedStudentLead* framework identifies each framework section and competency (Figure 5).

**Figure 5.**

*MedStudentLead Framework Sections and Competencies*




### 6.6. Limitations

As this PhD research was conducted part-time, and with three research phases (four if including the integrative review from Chapter 2), there was a significant amount of time between the start and completion of Phases 2 and 3, particularly at the time of COVID-19. These phases also stopped for some time due to health concerns and academic workload; however, this may have been favourable. The elapsed time provided multiple opportunities to read the aims, methodology, and writing (including notebook entries, ethics proposals, thesis drafts, and published articles). The result

has been a rich and detailed understanding of objectives, concepts, themes, and next steps—well beyond what had already been established.

The analysis of Matrix 2 "key leadership competencies that *should be taught* in the medical education continuum" was not weighted by participant group as it was decided all participant groups were equally important, including when the number of participants were smaller or larger. This analysis was used to identify relevant competencies to be added to the *MedStudentLead* framework. The validity of the *MedStudentLead* framework will be strengthened the more this living document becomes used and feedback is received.

### 6.7. Chapter Summary

This chapter described Phase 3, the last phase of the multiphase study. It described the Australian medical student training context and the Dreyfus model of skill acquisition.[104] Participant findings used to develop the *MedStudentLead* framework were provided in tables and discussed. Detailed information and a table of proposed challenges and responses for the *MedStudentLead* framework were also provided. The next chapter presents a tool for the *MedStudentLead* framework and is written as a list of tips for implementing an extracurricular leadership program for medical student clubs and societies.

# Chapter 7. Tips for Implementing an Extra-Curricula Leadership Program for Medical Student Clubs and Societies

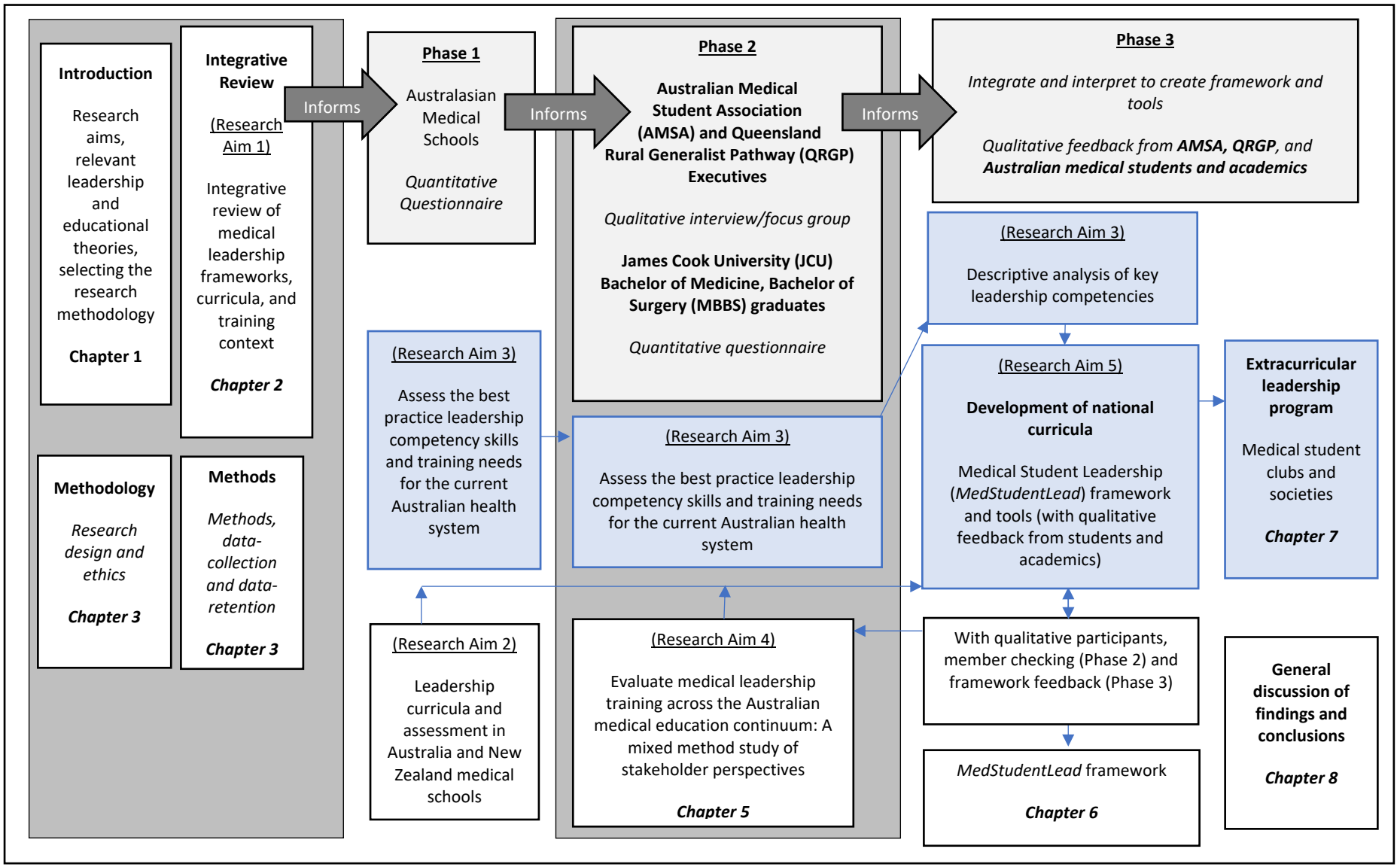
## 7.1. Introduction

This chapter was submitted to Medical Teacher in January 2023, however was not accepted due to the high number of submissions to the 12 Tips section. Medical Teacher advised it is suitable for the online *MedEdPublish* Journal, and the journal have been in contact, but submission has been delayed in this process due to peer review taking place post-publication.

This manuscript focuses on providing 12 Tips for Implementing an Extra-Curricular Leadership Program for Medical Student Clubs and Societies. The data in this research indicated many medical students and clinicians receive leadership skills training external to their training or workplace. The tips focus on student clubs and societies due to the large part they can play with professional, social and advocacy activities on campus. The manuscript has been written to provide value to the societies as well as the medical programs faculty by strengthening societies and increase student and faculty collaboration.

The submitted manuscript to Medical Teacher can be found as Attachment H. See a copy of Figure 1 below for an overview of this chapter in relation to other chapters in the thesis.

**Copy of Figure 1.** *Overview of This Study*



### 7.2. Summary of the Tips

The twelve tips have been written to address three phases. Phase 1 is likely to only occur once while forming the extra-curricular program with the student societies, compared to Phases 2 and 3 that will continue and progress as the program continues over the years.

- **Phase 1: Society needs and faculty and staff buy-in**
  - Tip1. Identify societies and their unique needs
  - Tip 2. Sign-up faculty / academic leaders
  - Tip 3. Write and submit your program proposal
- **Phase 2: Curricular and presenter opportunities**
  - Tip 4. Collaborate with the society nominees or Presidents to determine the agenda and planning process
  - Tip 5. Focus on collective society organisational culture challenges
  - Tip 6. Focus on outcomes effective to inter-society needs (collaboration between societies)
  - Tip 7. Focus on outcomes effective for specific intra-society needs
  - Tip 8. Invest in leadership skills training to tailor to the society executive roles
  - Tip 9. Identify and make use of the expertise within the societies
  - Tip 10. Invite expert leadership to present
- **Phase 3: Technology, and program evaluation**
  - Tip 11. Be flexible with the technology and delivery
  - Tip 12. Evaluate the program and discuss feedback with the societies

# Chapter 8. General Discussion of Findings and Conclusions

## 8.1. Introduction

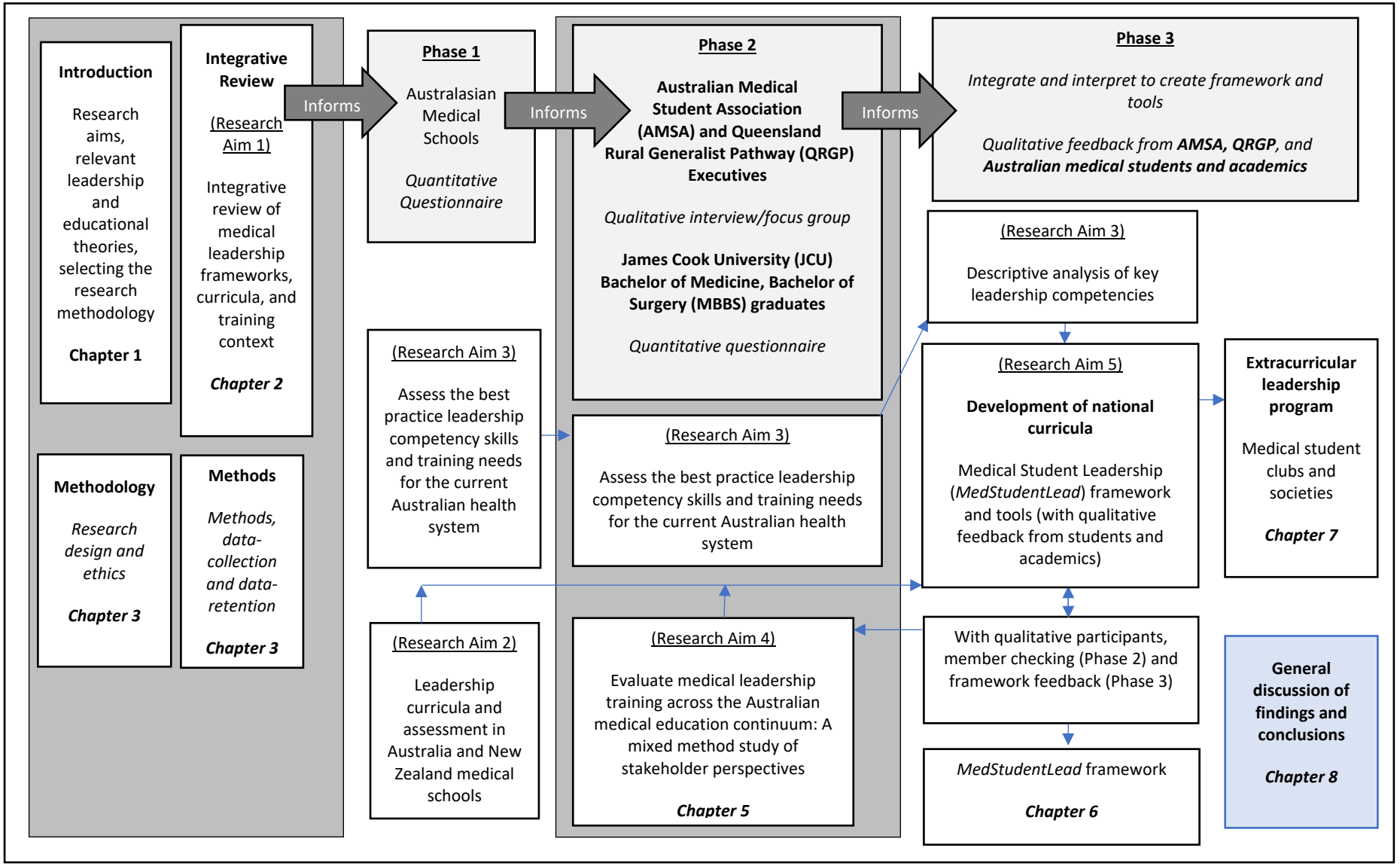
This chapter synthesises the evidence for medical leadership skills training in Australia. It discusses the strengths and limitations of this research and concludes with policy, education practice, and future research recommendations. A copy of Figure 1 is presented below as an overview of this chapter in relation to other chapters in this thesis.

## 8.2. Contributions to Medical Leadership Skills Training Across the Continuum

This research has provided a substantial contribution to the limited body of knowledge on Australian medical leadership training and assessment across the medical education continuum—from medical students to junior doctors and senior clinicians. Furthermore, this research has achieved many firsts, including the development of an Australian medical student leadership framework for primary medical programs.

The second chapter (published)[23] contributes to literature enhancing an understanding of medical leadership skills and training globally. To assist in this understanding, an integrative review was conducted. An evidence-based table was created to compare the three international frameworks that were based on medical leadership training competencies.[1-3] Each framework had similar domains with differences in domains or element titles, and with different contextual requirements of each country's healthcare organisation. Due to these contextual nuances, the Australian framework[2] (written for clinicians in practice) was selected for use. The UK framework in particular[1] was focused on evidence-based practice for patient care and safety, and this was deemed a requirement for any future Australian medical leadership framework.

**Copy of Figure 1.** *Overview of This Study*



A review of transformational leadership training provided an evidence base considering how this leadership style is practical and people-oriented, and ultimately benefits healthcare.[33-35,38,41-43,47,48,53,54] Additionally, an evidence-based figure was created to highlight transformational leadership education for medical students in practice. This figure started with the medical education system and culture, and then it showed how the learning opportunities in the curricula (informative learning) with practice opportunities can develop an understanding of leadership roles and values development (formative learning) thus supporting each student's growth as a transformative graduate leader. Additionally, a call to action provided many recommendations for medical educators, academics, and leaders to address the paucity of national training, curricula, evaluation, learning outcomes, and research agendas. Almost all of the six recommendations have been completed as part of this research. Chapter two and chapter four are uniquely different to a systematic review published in 2018 for medical students, which focussed on articles describing and evaluating medical leadership curricula.[131] Chapter two's focus is global training, current frameworks, and transformational leadership, whereas chapter four collects data directly from medical schools.

The fourth to sixth chapters presented original data, each with a different phase of the multiphase study design and with a distinct set of work. Chapter 4 presented Phase 1, a qualitative analysis of data collected from academics and medical deans in Australasia. The data focused on the extent of current leadership skills training and assessment, resulting in another peer-reviewed publication. This publication provided the first snapshot of the current leadership curricula and assessment of Australasian medical programs, with 16 of 22 (73%) eligible medical schools participating.[24] The findings identified that teaching methods used to deliver leadership education are diverse. So too are students' opportunities to learn medical leadership outside the curricula. Across the medical programs involved, the frequency of formal medical leadership assessment was reported at 69%, whereas 41% was reported for formally evaluating medical leadership. The findings also identified three main barriers that have direct implications for both policy and educational practice. These barriers were a lack of 1) shared national teaching, assessment, and evaluation resources; 2) agreed national curricula and guidelines for teaching assessment and evaluation; and 3) knowledge

and expertise in how to teach and assess leadership. Other barriers included a lack of teaching time and timetabling opportunities. These findings are mirrored in a 2023 published systematic review on medical schools in the United States.[132]

Chapter 5 presented Phase 2, the mixed methods analysis from JCU medical graduates (PGY4+), AMSA executives, and QRGP executives evaluating the medical leadership training across the Australian continuum. This chapter resulted in a third manuscript submitted for peer review (Appendix G). The findings contribute knowledge regarding the medical education continuum, formal leadership training practices, and medical leadership roles and experiences. New insights relating to clinician leadership training have indicated that there are more clinicians in leadership positions than those who have experienced formal training. Additionally, and importantly, less than half of specialists (44%) completed formal leadership training at their specialist college. Triangulation of the data revealed rich and deep key findings, including barriers and recommendations for change at every level on the medical education continuum. These findings, with implications for policy, relate to professional development and cultural change in the health workforce. The educational practice findings relate to teaching methods, teacher training, and core leadership and assessment competencies. Importantly, this research identified the impact of role models and mentors in the health workforce and the mentoring processes and values taught. Evidence-based recommendations were provided for medical leadership training for teachers, transformational leadership training for role models and mentors (with examples provided), and medical leadership training for all across the continuum.

Chapter 6 is another unique body of work that presented Phase 3; the development of the *MedStudentLead* framework.[130] This is distinctive research, as no analysis has previously been published in Australia in relation to leadership skills for Australian primary medical programs. A range of stakeholder feedback was collected to understand the overall perspective of leadership competencies for primary medical programs. The findings of Chapter 6 became an evidence base of the leadership skills required for a medical student to prepare for graduation. This important *MedStudentLead* framework outcome includes an evidence-based diagram of leadership

competencies. Each competency has an introduction, a discussion on why it is important for leadership, and teaching and assessment items based on the different contexts of Australian primary medical education settings. The framework diagram and a copy of the draft *MedStudentLead* framework were presented twice at the ANZAHPE Conference in 2023 (see Appendix I). The aim of these presentations was to ask for end-user feedback as part of validating the *MedStudentLead* framework, and end-user feedback was provided by medical education experts across Australia. During this process, an end user requested use of the framework within a different university medical program (not a JCU program) as a key reading during a student cohorts leadership assessment.

This research has revealed the need for shared national leadership teaching and assessment resources for medical students. The *MedStudentLead* framework and tools show promise in supporting the consistency of leadership skills training for students in Australian primary medical programs. Without reliable methods for evaluating these programs before or after using the framework, national comparisons between schools will remain subjective. Due to this, a primary evaluation tool for medical program leadership skills has been created as part of the *MedStudentLead* framework. If medical programs utilise this tool, it has implications for the national quality improvement of medical leadership projects.

## 8.3. Strengths and Limitations

### *8.3.1. Strengths*

The strengths of this multiphase mixed methods research are numerous and have been highlighted in publications including this thesis. Importantly, the research design was rigorous and each research aim mapped to individual phases of the multiphase study design. The integrative review (Chapter 2) and Phase 1 (Chapter 4) were peer reviewed and published. Phase 2 (Chapter 5) was also submitted for publication and peer review. End-user feedback was collected for Phase 3 (Chapter 6), which strengthened and validated the *MedStudentLead* framework.

Other strengths include how the research was not constricted by a top-down approach or by funds; instead, participants were learning, working, or teaching in a role where medical leadership

occurs daily either formally or informally. As the PhD research was conducted by a social scientist working as an academic in medical education, the *MedStudentLead* framework will remain a focus of research and teaching. During post-PhD research with students, peers, colleagues, and supervisors, the *MedStudentLead* framework will be adapted to accommodate junior doctors and senior clinicians, and the website will be updated with teaching resources and evaluation protocols.

The importance of this research has been recognised as worthy of dissemination by the number of publications and conference presentations. To date, the integrative journal article (Chapter 2) "Why we need to teach leadership skills to medical students: A call to action" has four indexed citations and an altimetric score of 16.

Another strength is the effort undertaken to collect end-user feedback on a drafted copy of the *MedStudentLead* framework. Additionally, a final strength was disseminating the evidence and the *MedStudentLead* framework through conference presentations, social media, and articles—where it would reach medical students and academics and provide opportunities for further validation and feedback.

### *8.3.2. Limitations*

Several limitations should be noted regarding the conduct of this study. As frequently outlined in pragmatic research, the limitations for each phase were identified and published with corresponding articles. Phase 1 (Chapter 4) included a limitation regarding the UK Faculty of Medical Leadership and Management Curricula Study – Interview Guide[12] used as a foundation to create the *Medical Leadership Curricula, Assessment and Evaluation Survey*. This UK guide had previously been designed for UK medical schools only. The survey questions were adapted to be more specific to Australasian medical education and the findings reported similar results. This survey was self-reported, although it has a high response rate (73%) and is therefore unlikely to be significantly affected by selection bias.

Phase 2 (Chapter 5) may have been limited by sampling bias involving the selection of JCU medical graduates rather than all Australian medical graduates. However, as a PhD rather than a national multiphase study with multiple Australian researchers, it was deemed appropriate.

Additionally, the study did not evaluate a core medical leadership training program; instead, the study identified the status of medical leadership roles, training, and recommendations. The proposed leadership skills data were collected for junior doctors and senior clinicians but exceeded the scope of work necessary to create a framework. This limitation will be addressed in future research and practice.

Across all data collection phases, only a small number of medical students participated. More engagement could have assisted in understanding medical students' knowledge and expectations of their future roles as clinical leaders. Additionally, the leadership competencies reflect the time of data collection and analysis (before the end of 2020), and some of the competencies might have differed if they were reviewed with the updated AMC graduate outcomes (early 2023). Permission was sought to interview the RACMA executive and teachers, but no agreement was formed. Although a detailed dissemination strategy was put in place, the deployment of the *MedStudentLead* framework is limited as the study was conducted by a PhD candidate, not by a regulatory agency or medical specialist training organisation.

## 8.4. Recommendations

### *8.4.1. Implications for Healthcare Policy*

This research provides evidence that academics, doctors, and specialist training organisations were aware and concerned about the lack of leadership training across the medical education continuum. New forms of policy are required to holistically transform medical leadership training within Australia. From the findings of this thesis, the following recommendations are:

- The AMC introduce new accreditation standards to support the development of the medical leadership curricula, with strategies for evaluation via research funding.
- The Medical Deans Australia and New Zealand develop a medical leadership policy statement that
    - includes leadership teaching and assessment training opportunities
    - includes professional development for medical educators who are teaching leadership

  - develops a strong leadership curriculum linked to evidence.
- All specialist training colleges provide medical leadership as part of continuing professional development. Additionally, colleges consider scholarships to encourage the next generation of healthcare leaders to step up.
- Medical students, clinicians, academics, specialist training organisations, and other non-clinicians who work as leadership experts become panel members who develop new standards for various levels of medical education. This will ensure the content remains contemporary.

### *8.4.2. Implications for Education Practice*

This research demonstrates a need for stakeholders' input to develop a holistic medical leadership curriculum. These stakeholders include students, medical educators, doctors, and specialist trainers. Changes to educational practice are needed to refine the current awareness of leadership skills training and to support an evaluation of this practice. Aligning leadership curricula with competency-based leadership models better standardises the learning outcomes and their evaluation.

#### **8.4.2.1. Education Recommendations.** The education recommendations include:

- Share national teaching and assessment resources of medical leadership across the medical education continuum. Resources include leadership competencies, teaching modules, assessment processes, and evaluation guidelines. This will guide teachers' understanding of how to teach and assess leadership.
- Include teacher and role model training. When role models (or mentors) and teachers teach values, skills, and knowledge, this impacts positively on teamwork and patient interaction. To support medical students and clinicians, key teacher and role model training should encompass transformational leadership skills training, such as
  - role model skills for use with others
  - personal and professional values development
  - teamwork and networking skills
  - health advocacy and service skills

    - transformative education practices.
- Include transformational leadership skills training in a clinical setting. This may strengthen leadership and increase interprofessional teamwork, patient interaction, and patient safety.[133] Over time, this type of training could produce a pipeline effect, with peers and colleagues increasing their own mentoring and leadership skills to become leaders who influence and instil positive behaviour changes in others.
- Create extracurricular programs for medical students to complete voluntary leadership skills training. This could be for the executive of student clubs and societies, or as a retreat (see Chapter 7). Ensure the format of leadership skills training is practical, as students prefer hands-on training.
- Ensure formal medical leadership training is relevant to real-world medical applications. Promote teamwork and patient-centred values and encourage innovative thinking for quality improvement and patient safety.

**8.4.2.2. Evaluation Recommendation.** The evaluation of leadership skills in primary medical programs and specialty training college programs is warranted to interpret the level of skills currently being taught, and whether the program requires more skill development.

### *8.4.3. Recommendations for Future Research*

The focus of this research was to understand the medical leadership curricula across the medical education continuum, and then develop an Australian medical leadership framework for students. Since the framework's development and the collection of end-user feedback, future research strategies have been considered.

**8.4.3.1. *MedStudentLead* Research and Resources.** Future research offers opportunities to pilot the *MedStudentLead* framework in undergraduate and graduate medical programs, and urban and rural programs. The pilot study could review the immediate knowledge gained by the students, and students' different leadership training needs in various Australian medical education settings. Further

resources for students and staff could be provided as part of the next version of the *MedStudentLead* framework. This includes:

- A tool for students to record their learning of learned leadership competencies from levels of novice to proficient mastery.
- Resources for staff, such as
  - scenarios with various leadership skills (e.g., conflict resolution, communication skills, and interprofessional competencies)
  - mock teaching assessment activities
  - training opportunities for academic and professional staff regarding their own leadership style and skills in education settings.

#### 8.4.3.2. Other Medical and Health Professional Leadership Research Practice.

It is recommended to address the cultivation of a medical leadership community of practice to create an integrated Australian and New Zealand medical leadership framework for medical students, junior doctors, and clinicians. This could then be expanded to accommodate all medical students, doctors, and specialist training organisations in Australia—to broaden the sample population and confirm the outcomes.

As leadership is of expanding interest across most health professions, and nursing in particular, it is proposed this work could be re-used with the relevant recommended changes, to determine the state of leadership training in other professions.

## 8.5. Conclusion

This thesis shows that medical student leadership training is not currently transformative. This is evident through a lack of transformative education practices in medical programs, and limited teaching of the transformational leadership style to medical students. Australasian medical leadership training and assessment is currently occurring ad hoc in medical programs. The complexities of providing quality leadership training will continue to create challenges for medical students, academics, clinicians, and specialist training organisations across the medical education continuum.

This research has summarised, confirmed, and provided new evidence at a national level. Such evidence includes the first Australian leadership framework for medical students and academics, which is expected to provide lasting evidence to inform leadership skills training. This *MedStudentLead* framework provides a way to systematise leadership teaching and assessment for medical students in Australia.

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## Appendix A.

## Published Integrative Review for *BMJ Leader*

Review

# Why we need to teach leadership skills to medical students: a call to action

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**ABSTRACT**
Health system reform models since the early 1990s have recommended leadership training for medical students, graduates and health workers. Clinicians often have leadership roles thrust on them early in their postgraduate career. Those who are not well trained in leadership and the knowledge that comes with leadership skills may struggle with the role, which can impact patient safety and create unhealthy working environments. While there is some literature published in this area, there appears to be little formal evaluation of the teaching of leadership, with scarcely any discussion about the need to do so in the future. There are clear gaps in the research evidence of how to teach and assess medical leadership teaching. In this paper, three leadership frameworks from Australia, Canada and the UK are compared in terms of leadership capabilities for a global view of medical leadership training opportunities. A literature review of the teaching, assessment and evaluation of leadership education in medical schools in Australia, the UK and America is also discussed and gaps are identified. This paper calls for an education shift to consider practical health system challenges, citing the mounting evidence that health system reform will require the teaching and rigorous evaluation of leadership methods. Opportunities for teaching leadership in the curricula are identified, as well as how to transform leadership education to include knowledge and practice so that students have leadership skills they can use from the time they graduate.



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# Appendix B.

## Information Sheet and Informed Consent for AMSA and QRGP

**INFORMATION SHEET**

TITLE: **"Teaching leadership skills to medical students: Are we transformative yet?"**

You are invited to take part in a research project about **the best practice leadership training needs for the current Australian health system**. The study is being conducted by **Simone Ross** and will contribute to a **PhD** in **medical education** at James Cook University.

**Background**

Medical leadership spans health workforce boundaries across geographical, inter-professional, and the health system contexts locally, nationally, and internationally. Health system reform models since the early 2000s have recommended leadership training for medical students, graduates and health workers. There are varying views in the literature about whether medical students and graduates should be trained in leadership skills, however there is a paucity of research evaluating both students and graduate leadership training impact to health system reform and patient care.

**The project and your role**

This project aims to assess the best practice leadership training needs for the current Australian health system. Thus we wish to involve medical students, graduates, academic leads and/or College Deans, Australian Medical Student Association, Queensland Rural Generalist Pathway, and Royal Australasian College of Medical Administrators.

If you agree to be involved in the study, you will be invited to be interviewed face to face or via online (via ZOOM). The interview, with your consent, will be audio-taped and should only take approximately 1 hour of your time. The interview will be conducted in your location and at a time convenient to you. You will be asked about your medical leadership education, training experience, and recommendation for leadership across the training continuum.

Taking part in this study is completely voluntary and you can stop taking part in the study at any time without explanation or prejudice. Also, choosing to participate or not will in no way affect your relationship with the James Cook University College of Medicine and Dentistry. If you choose to stop taking part in the study you can request to withdraw any unprocessed data.

This research is low risk research and there should not be any risks or distress for participants.

If you know of others that might be interested in this study, please pass on this information sheet to them so they may contact me to volunteer for the study.

Your responses and contact details will be strictly confidential. The data from the study will be used in research publications and reports **(journal articles, theses, research reports)**. You will not be identified in any way in these publications and reports.

If you have any questions about the study, please contact – **Simone Ross or Tarun Sen Gupta.**

**Principal Investigator:**
**Name: Simone Ross**
**College: Medicine and Dentistry**
**James Cook University**
**Phone:**
**Email: Simone.ross@jcu.edu.au**

**Supervisor:**
**Name: Tarun Sen Gupta**
**College: Medicine and Dentistry**
**James Cook University**
**Phone:**
**Email: Tarun.sengupta@jcu.edu.au**

***If you have any concerns regarding the ethical conduct of the study, please contact:***
***Human Research Ethics Committee, Townsville Hospital and Health Service***
***The Townsville Hospital, Townsville, Qld, 4810***
***Phone: (TSV-Ethics-Committee@health.qld.gov.au)***

30/10/19 v3

**INFORMED CONSENT FORM – INTERVIEW**

| |
|---|
| PRINCIPAL INVESTIGATOR: Simone Ross |
| PROJECT TITLE: Teaching leadership skills to medical students: Are we transformative? |

I understand the aim of this research study is to **determine the best practice leadership training needs for the current Australian health system.**

I consent to participate in this project, the details of which have been explained to me and I have been provided with a written information sheet to keep. I understand that my participation will involve an interview and I agree that the researcher may use the results as described in the information sheet.

I acknowledge that:

- taking part in this study is voluntary
- I am aware that I can stop taking part in this study at any time without explanation or prejudice
- I am aware I can withdraw any unprocessed data I have provided in an interview
- that any information I give in an interview will be kept strictly confidential and that no names will be used to identify me with this study without my approval

| | *(Please tick to indicate consent)* | | | |
|---|---|---|---|---|
| **I consent to be interviewed** | ☐ | **Yes** | ☐ | **No** |
| **I consent for the interview to be audio taped** | ☐ | **Yes** | ☐ | **No** |

| | |
|---|---|
| **Name:** *(printed)* | |
| **Signature:** | **Date:** |

**I (the Principal Investigator) certify that I have explained the study to the participant and consider that he/she understands what is involved.**

| | |
|---|---|
| **Name:** *(printed)* | |
| **Signature:** | **Date:** |

12/12/19 v3

**Appendix C.**

**Semi-Structured Focus Group Guide**

# Teaching leadership skills to medical students: Are we transformative yet?

## Executives of Queensland Rural Generalist

Signed informed consent has been returned..... ☐

Recording device is turned on ..... ☐

Date and time spoken into recording device ..... ☐

Confirmation regarding member checking of results..... ☐

FOR NOTING: I have had success in connecting with RACMA, but due to tight time-frames and COVID-19, I have not had success in gaining approval for interviews.

## Questions to ask Queensland Rural Generalist Executives

### *Overview of the training program*

Q1. Could you tell me about your leadership training programs?

(Queensland Rural Generalist Leader Program, Step Up Leadership Program, Leadership for Clinicians Training Program)

(PROMPTS – How long does it take to complete; are participants required to complete it or can they do a module or two, how often does it run etc.; what level is each completed – introduced, reinforced, mastered; what are the expected learning outcomes for the program)

Q2. Why was the decision made to create this program? Beyond any accreditation requirements, what did you see in action that made you consider leadership training as essential for rural generalists?

Q3. What guides the structure of your program? (PROMPTS – how was it designed; what frameworks are used etc.)

Q4. How was the curricula developed and the learning outcomes defined?

### *Delivery*

Q5. What teaching methods are used to deliver leadership education? (e.g. small group seminars or workshops, lectures, problem based learning, experiential learning, student selected components)

### *Assessment*

Q6. What kinds of assessment happens for the leadership learning? (PROMPT: portfolio; logbook; reflective writing; feedback – tutor; feedback – mini-CEX; project report; meeting course requirements; presentation sessions; written examinations)

### *Evaluation*

Q7. Is there any evaluation of the medical leadership learning to identify if they meet the expected outcomes? (PROMPT: student feedback, pre-intervention and immediate post-intervention evaluation, and/or monitoring evaluation)

### *Overview of past and current leadership skills building*

Q8. May I confirm that RACMA is responsible for running the leadership training? (If yes, is anyone on the executive also a trainer? Or are there any other trainers also from QRGP and not associated with RACMA?)

Q9. If YES to Q8 above, how are educators/executives trained for the role of leadership educator? (PROMPT: curricula, how long it goes for, who the trainers are, professional practice etc.)

### *Medical education leadership skills competencies*

Q10. One of the focuses of my study is on how basic medical education training can help with leadership and management skills of medical students into the future. These skills have been aligned to the Health LEADS Australia Framework, would you be so kind as to advise **where you think these skills should be taught in the progression of basic medical education, junior doctor, to senior clinician?** You may select more than one answer for each skill.

| **Health LEADS Domain** | **Competencies** | **Basic medical education** | **Junior doctor** | **Senior clinician** |
|---|---|---|---|---|
| Self | Ethical decision making | | | |
| | Self-management | | | |
| | Emotional intelligence and self-awareness | | | |
| | Exploring values | | | |
| | Critical reflective practice | | | |
| Engages Others | Communication | | | |
| | Inter-professional teamwork | | | |
| | Partnering with stakeholders | | | |
| | Power in organisation | | | |
| | Networking | | | |
| Achieves Outcomes | Critical thinking and decision making | | | |
| | Managing staff | | | |
| | Project management | | | |
| | Financial management | | | |
| | Negotiation | | | |

| | | | | |
|---|---|---|---|---|
| Drives Innovation | Creativity and visioning | | | |
| | Evidence based practice and use | | | |
| | Successfully managing conflict | | | |
| | Building positive workplace culture | | | |
| | Leadership and management of change | | | |
| | Quality and service improvement | | | |
| | Workforce planning | | | |
| Shapes Systems | Strategic planning | | | |
| | Health service planning | | | |

Q11. After completing the above, which domains or competencies do you think the majority of leading teaching occurs in your program?

Q12. What do you think are the potential barriers for teaching leadership in basic medical education?

Q13. What support do you think would be helpful for medical schools to integrate or assess leadership in the curricula?

Q14. Are there examples of good practice of teaching or assessing leadership that you would wish to share?

Q15. Do you have any questions? Or, is there anything you wish I had asked you that you would like to share?

THE END

**Appendix D.**

**Semi-Structured Interview Guide**

# Teaching leadership skills to medical students: Are we transformative yet?

## Executives of the Australian Medical Student Association

Signed informed consent has been returned..... ☐ Recording device is turned on ..... ☐

Date and time spoken into recording device ..... ☐

## Questions to ask 2019/2020 AMSA National Executives

### *Overview of past and current leadership skills building*

Q1. As an Executive of AMSA you are a leader in your own right. Prior to applying to AMSA, what experiences have you had that have built your leadership skills?

Q2. Since working as an Executive at AMSA, what experiences or learnings have you had to build or shape your leadership style?

Q3. Are AMSA Executives required to attend generic leadership training? If yes, what training?

Q4. How are you trained for your specific role as an Executive?

### *Overview of National Leadership Development Seminar (ask participant as required)*

Q5. Could you tell me about your National Leadership Development Seminar?

Q6. What guides the structure of your National Leadership Development Seminar

### *Medical education leadership skills competencies*

Q7. One of the focuses of my study is on how basic medical education training can help with leadership and management skills of medical students into the future. These skills have been aligned to the Health LEADS Australia Framework, would you be so kind as to advise where you think these skills should be taught in the progression of basic medical education, junior doctor, to senior clinician? You may select more than one answer for each skill.

| **Health LEADS Domain** | **Competencies** | **Basic medical education** | **Junior doctor** | **Senior clinician** |
|---|---|---|---|---|
| Self | Ethical decision making | | | |
| | Self-management | | | |
| | Emotional intelligence and self-awareness | | | |
| | Exploring values | | | |
| | Critical reflective practice | | | |
| Engages Others | Communication | | | |
| | Inter-professional teamwork | | | |
| | Partnering with stakeholders | | | |
| | Power in organisation | | | |
| | Networking | | | |
| Achieves Outcomes | Critical thinking and decision making | | | |
| | Managing staff | | | |
| | Project management | | | |
| | Financial management | | | |
| | Negotiation | | | |
| Drives Innovation | Creativity and visioning | | | |
| | Evidence based practice and use | | | |
| | Successfully managing conflict | | | |
| | Building positive workplace culture | | | |
| | Leadership and management of change | | | |
| | Quality and service improvement | | | |
| Shapes Systems | Workforce planning | | | |
| | Strategic planning | | | |
| | Health service planning | | | |

Q8. What do you think are the potential barriers for teaching leadership in basic medical education?

Q9. What support do you think would be helpful for medical schools to integrate or assess leadership in the curricula?

Q10. Are there examples of good practice of teaching or assessing leadership that you would wish to share?

Q11. Do you have any questions? Or, is there anything you wish I had asked you that you would like to share?

THE END

## Appendix E.

## Medical Leadership Survey for Doctors (JCU Graduates)

The JCU medical school tracks graduates via two yearly surveys to answer locally or nationally important questions around medical workforce.

This time we would like our 2005 to 2017 graduates to answer a 12 minute short survey regarding medical leadership training needs across Australia.

FYI, we obtained your contact details in the Exit Survey you filled out at graduation, where you gave your consent to be contacted for further studies, such as this one.

Medical leadership survey with information sheet and informed consent

QUESTIONNAIRE

This survey covers a series of questions to inform national leadership competencies across the medical education continuum. The results from this study will be used to guide the development of a national leadership curriculum, and to identify the factors and experiences that make local and national leaders.

RESEARCHERS INVOLVED

Ms Simone Ross is conducting this survey under the supervision of Prof Tarun Sen Gupta and A/Prof Peter Johnson at James Cook University as part of a PhD in medical education. Human Ethics Committee (H6985) at James Cook University has approved the study.

CONFIDENTIALITY

This survey is voluntary, and you can stop at any time without explanation or prejudice. All information will be kept confidential, and results will be anonymised. The data from the study will be used in research publications and reports and you will not be identified in any way in these publications and reports.

PREFER TO BE INTERVIEWED?

If you would prefer not to complete this survey and instead have a face-to-face interview via video-conference, please email simone.ross@jcu.edu.au.

CONSENT TO COMPLETE SURVEY

When you click on the NEXT button below, you consent to participate in this project.

**General Questions**

* 1. Your full name

* 2. Your primary job title

* 3. Please indicate which category best corresponds to your current practice. Select all that apply

Working as a private specialist

Working as a public specialist

Working as a specialist in both the private and public sectors

Working as a general practitioner

Working as a rural generalist

Specialist-in-training

Hospital non-specialist

Junior doctor (PGY1-3)

Predominantly locum doctor

Educator

Temporarily not practising (e.g. maternity leave). Please also select your most recent position above.

No longer practising in medicine

Other type of doctor not listed above (please specify)

* 4. Are you currently or have you previously been in a medical leadership role? Select all that apply.

Yes in basic medical education (medical school)

Yes as a junior doctor (PGY1-3) - previously

Yes as a junior doctor (PGY1-3) - currently

Yes as a senior clinician (PGY4+) - previously

Yes as a senior clinician (PGY4+) - currently No

If yes, please describe what type of leadership role.

**National Leadership Competencies**

The next five questions are asking about leadership competencies as defined by the Health LEADS Australia framework. Your responses will be summarised to inform national leadership competencies across the medical education continuum from basic medical education (medical school), through junior doctor and into senior clinician years.

* 5. Competency 1. Leads Self: At what education level do you believe the following leadership skills should be taught across the medical education continuum?

Multiple options can be selected per leadership skill. For example, ethical decision making could be selected in basic medical education and/or junior doctor and senior clinician.

| | Basic medical education | Junior doctor (PGY1-3) | Senior clinician (PGY4+) | Should not be taught |
|---|---|---|---|---|
| Ethical decision-making | ☐ | ☐ | ☐ | ☐ |
| Self-management | ☐ | ☐ | ☐ | ☐ |
| Emotional intelligence and self-awareness | ☐ | ☐ | ☐ | ☐ |
| Exploring values | ☐ | ☐ | ☐ | ☐ |
| Critical reflective practice | ☐ | ☐ | ☐ | ☐ |

* 6. Competency 2. Engages Others: At what education level do you believe the following leadership skills should be taught across the medical education continuum?

Multiple options can be selected per leadership skill.

| | Basic medical education | Junior doctor (PGY1-3) | Senior clinician (PGY4+) | Should not be taught |
|---|---|---|---|---|
| Communication | ☐ | ☐ | ☐ | ☐ |
| Inter-professional teamwork | ☐ | ☐ | ☐ | ☐ |
| Partnering with stakeholders | ☐ | ☐ | ☐ | ☐ |
| Power in organisations | ☐ | ☐ | ☐ | ☐ |
| Networking | ☐ | ☐ | ☐ | ☐ |

* 7. Competency 3. Achieves Outcomes: At what education level do you believe the following leadership skills should be taught across the medical education continuum?

Multiple options can be selected per leadership skill.

| | Basic medical education | Junior doctor (PGY1-3) | Senior clinician (PGY4+) | Should not be taught |
|---|---|---|---|---|
| Critical thinking and decision-making | ☐ | ☐ | ☐ | ☐ |
| Managing staff | ☐ | ☐ | ☐ | ☐ |
| Project management | ☐ | ☐ | ☐ | ☐ |
| Financial management | ☐ | ☐ | ☐ | ☐ |
| Negotiation | ☐ | ☐ | ☐ | ☐ |

* 8. Competency 4. Drives Innovation: At what education level do you believe the following leadership skills should be taught across the medical education continuum?

Multiple options can be selected per leadership skill.

| | Basic medical education | Junior doctor (PGY1-3) | Senior clinician (PGY4+) | Should not be taught |
|---|---|---|---|---|
| Creativity and visioning | ☐ | ☐ | ☐ | ☐ |
| Evidence-based practice and use | ☐ | ☐ | ☐ | ☐ |
| Successfully managing conflict | ☐ | ☐ | ☐ | ☐ |
| Building positive workplace culture | ☐ | ☐ | ☐ | ☐ |
| Leadership and management of change | ☐ | ☐ | ☐ | ☐ |
| Quality and service improvement | ☐ | ☐ | ☐ | ☐ |

* 9. Competency 5. Shapes Systems: At what education level do you believe the following leadership skills should be taught across the medical continuum?

Multiple options can be selected per leadership skill.

| | Basic medical education | Junior doctor (PGY1-3) | Senior clinician (PGY4+) | Should not be taught |
|---|---|---|---|---|
| Workforce planning | ☐ | ☐ | ☐ | ☐ |
| Strategic planning | ☐ | ☐ | ☐ | ☐ |
| Health service planning | ☐ | ☐ | ☐ | ☐ |

**Formal Leadership Training and Barriers**

* 10. Have you undertaken formal leadership training? Select all that apply

Yes - during medical school as part of the curriculum

Yes - during medical school as extra-curricular

Yes - as a junior doctor

Yes - within specialist medical college training

Yes - self-funded generic leadership training

No - my leadership training is on the job experience

No - have not had any leadership training or experience

If yes, please explain your choice above (e.g. a subject or two, specialty training college and extent of leadership training, committee member/leader etc.). Add all that apply.

* 11. What might be any potential barriers that you have experienced or anticipate experiencing in regard to formal leadership training?

**Your Leadership Opportunities**

* 12. Have you had opportunities to experience medical leadership training?

Yes - I completed it

Yes - I chose not to do it No

If yes, please explain your choice above including the title of the leadership training.

**Leadership Teaching Methods and Assessment**

* 13. How were the leadership skills taught? Select all that apply

As a common thread carried throughout the entire curricula or across several subject's

Specific module undertaken by all students

Specific module undertaken as elective

Ad hoc

Please describe your choice/s above in relation to the leadership training received in Q10.

* 14. What teaching methods were used to deliver the leadership education? Select all that apply

Problem based learning

Lectures

Small group seminars or workshops

Experiential learning

Student selected component

Double degree with leadership

Other (please specify)

* 15. How were the medical leadership competencies assessed? Select all that apply

Portfolio

Logbook

Reflective writing

Feedback – tutor

Feedback – multisource

Mini-CEX

Professional behavior score Project report

Audit (report)

Case-based discussion

Structured clinical assessments (e.g. OSCE)

Presentation sessions

Written examinations

Not assessed

Other (please specify)

* 16. Within medicine, what experiences or on-the-job learnings have you had to build or shape your leadership skills or style?

(e.g. watching and observing the successes and failure of others, receiving clear-cut and well-communicated leadership advice, coached by a mentor, identified my leadership learning needs and worked with others to fulfill them etc.)

* 17. Outside of medicine, what experiences or extra-curricular learnings have you had to build or shape your leadership skills or style?

18. Have you had any role models influence your leadership skills?

Yes No

If yes, how did these role models influence your leadership skills?

* 19. What changes would you like to see in medical leadership training across the continuum from medical student to senior doctor? What would you recommend?

**End Page**

20. If you would be interested in participating in a formal interview regarding medical leadership, please supply contact details below.

Email Address:

Phone Number:

21. If you know of any educationally influential medical leaders in your field who might be interested in an interview, please supply contact details below. We will require full name, then facility, email or phone number.

Name:

Facility:

Email Address:

Phone Number:

Thank you for your time and effort in completing this survey. At any time you wish to be in contact, please email: simone.ross@jcu.edu.au

Please select the DONE button below to submit your completed survey.

Documents used to design this survey

1. Jefferies R, Ibrahim HN, Sheriff JH, et al. Leadership and Management in UK Medical School Curricula. Journal of Health Organization and Management. 2017;30(7)1081-1104

2. Day GE, Leggat SG. Leading and Managing Health Services: An Australasian Perspective. 2015. Cambridge University Press. ISBN: 9781316379684

3. Health LEADS Australia: the Australian Health Leadership Framework. https://www.aims.org.au/documents/item/352

4. Standards of Assessment and Accreditation of Primary Medical Program by the Australian Medical Council 2012. Page 4. http://www.amc.org.au/joomla-files/images/Accreditation/FINAL-Standards-and-Graduate-Outcome-Statements-20-December- 2012.pdf

## Appendix F. Published Research Article for BMC Medical Education

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BMC Medical Education

RESEARCH ARTICLE Open Access

# Leadership curricula and assessment in Australian and New Zealand medical schools

Simone Jacquelyn Ross*, Tarun Sen Gupta and Peter Johnson

**Abstract**

**Background:** The Australian Medical Council, which accredits Australian medical schools, recommends medical leadership graduate outcomes be taught, assessed and accredited. In Australia and New Zealand (Australasia) there is a significant research gap and no national consensus on how to educate, assess, and evaluate leadership skills in medical professional entry degree/programs. This study aims to investigate the current curricula, assessment and evaluation of medical leadership in Australasian medical degrees, with particular focus on the roles and responsibilities of medical leadership teachers, frameworks used and competencies taught, methods of delivery, and barriers to teaching leadership.

**Methods:** A self-administered cross-sectional survey was distributed to senior academics and/or heads or Deans of Australasian medical schools. Data for closed questions and ordinal data of each Likert scale response were described via frequency analysis. Content analysis was undertaken on free text responses and coded manually.

**Results:** Sixteen of the 22 eligible (73%) medical degrees completed the full survey and 100% of those indicate that leadership is taught in their degree. In most degrees (11, 69%) leadership is taught as a common theme integrated throughout the curricula across several subjects. There is a variety of leadership competencies taught, with strengths being communication (100%), evidence based practice (100%), critical reflective practice (94%), self-management (81%), ethical decision making (81%), critical thinking and decision making (81%). Major gaps in teaching were financial management (20%), strategic planning (31%) and workforce planning (31%). The teaching methods used to deliver medical leadership within the curricula are diverse, with many degrees providing opportunities for leadership teaching for students outside the curricula. Most degrees (10, 59%) assess the leadership education, with one-third (6, 35%) evaluating it.

**Conclusions:** Medical leadership competencies are taught in most degrees, but key leadership competencies are not being taught and there appears to be no continuous quality improvement process for leadership education. There is much more we can do as medical educators, academics and leaders to shape professional development of academics to teach medical leadership, and to agree on required leadership skills set for our students so they can proactively shape the future of the health care system.

**Keywords:** Leadership, Medical leadership, Medical education, Medical student, Health system, Australia, Evaluation

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College of Medicine and Dentistry, James Cook University, Douglas, Queensland, Australia

## Background

Health system reform models since the early 1990s have recommended leadership training for both medical students and doctors [1–7]. A clinical leader is expected to be able to recognise when health service change is required, motivate and inspire others to also do so, ensure the safety of the team's action and outcomes, increase the ethical underpinnings of a health organisation and improve the quality of patient care [8–11].

In Australia, Health Workforce Australia, then the national health workforce agency, published a major report in 2013, the *Health LEADS Australia framework* in response to the perceived gap in medical leadership education and practice. This seminal report was the first national report and first national framework on medical leadership. While the Australian framework was written for health professionals in practice and not for medical professional entry degree/programs, it can, however, be utilised as key leadership training needs for medical education and across the Australian health system. The framework has a clear outline for working with others, and for promoting health system change. The framework outlines essential requirements for medical leadership training, including the five LEADS domains of *Leads Self, Engage Others, Achieve Outcomes, Drive Innovation, and Shape Systems* [12].

The Australian Medical Council (AMC), the accrediting body for medical schools, updated the *Standards for Assessment and Accreditation for Primary Medical Programs* in 2012 [13] and included a new domain of professionalism and leadership. Described within this domain, are ten graduate outcomes with two relating to demonstrating or describing the qualities and principles of leadership (4.2 and 4.3). Another two refer to desirable qualities of medical leadership, such as being an effective inter-professional team member (4.8) and educating colleagues for patient care (4.9). While the AMC allows medical professional entry degrees/programs flexibility in how they meet these graduate outcomes, this evidence suggests the AMC expects leadership education is to be taught, assessed and evaluated in all medical schools.

There are significant gaps in the research literature on how to educate, assess, and evaluate leadership skills in medical professional entry degree/programs. Numerous authors in the United Kingdom [14], United States [15] and Australia [16] have described the paucity of research in the teaching and assessment of leadership skills training across the continuum of medical education. Teaching of leadership in medical degrees is often not compulsory, with the curricula developed without assessable leadership competencies [14–17]. From an education perspective, McKimm [18] recently noted that *'leadership practice and development ... needs to be evidenced based, theory informed and practice driven'*. The current authors have recently argued [19] that leadership in practice can only occur for students if the organisational structure and culture of medical schools, hospital services and private practices allows students the opportunity to learn to lead and to practise. From an assessment and evaluation perspective, Lees and Armit [20] recently asserted that *'medical leadership enjoys less respect within the industry, [with] minimal research funding'*. This can have a detrimental impact on the development of any new curricula, let alone one that is required to be taught, assessed and evaluated.

As there is no Australian and New Zealand (Australasian) national consensus on when or how to teach, assess, or evaluate leadership in a medicine curriculum, it is clear that there is much we can do as medical educators, academics and leaders to shape a medical leadership curricula and agree on the required skills taught and assessed in Australasian medical professional entry degree/programs. This paper describes the results of a medical leadership curricula, assessment and evaluation survey of medical professional entry schools in Australasia. This survey sought to examine:

(1) the roles and responsibilities of medical leadership teachers;
(2) medical leadership frameworks and usage in the curricula;
(3) medical leadership competencies taught under the Health LEADS Australia domains;
(4) current methods of delivery and opportunities for student feedback;
(5) methods of assessment and the competencies assessed;
(6) barriers to leadership education, assessment, and evaluation;
(7) the support required to integrate or assess leadership in the curriculum.

## Methods

In Australasia, there are a variety of medical professional entry degree/programs including undergraduate entry or graduate entry, or a mix of both. In this paper, the term *undergraduate entry* refers to a university tertiary degree where the entry requirement is to have completed and hold a secondary school qualification, whereas *graduate entry* refers to a university tertiary degree where the entry requirement is to have already completed and hold a tertiary university degree qualification. Also, in this paper, the terms medical school or programs/degrees, refers to a qualification that permits the holder to seek general registration as a medical practitioner and does not refer to specialist (postgraduate) training.

A self-administered cross-sectional survey was distributed to senior academics and/or Heads or Deans of

Australasian medical schools. Data was collected over an eight-month period. In November 2018 a letter of invitation to complete an online survey was emailed to an email alias of senior academic medical school staff in Australasian medical schools. In July 2019, a second letter of invitation was then sent via email to medical Deans or Heads of schools who had not completed the survey. To ensure consistency of data, the same survey was administered.

### Survey development

Survey questions were based on a review of medical leadership articles, documents and surveys. The United Kingdom Faculty of Medical Leadership and Management (FMLM) Curricula Study – Interview Guide [14] was used as a foundation for the survey. According to Jefferies et al., the FMLM Curricula Study – Interview Guide (2017, p1095) was created to "*establish a picture of leadership and management in education in undergraduate medical curricula at all UK medical schools*". The survey questions were adapted to be more specific to Australasian medical leadership requirements, and medical education, assessment and evaluation. Questions covered: background; current leadership curricula and development and potential barriers; student assessment, evaluation and potential barriers; and questions to inform national leadership competencies across the medical education continuum from selection to graduate education. Questions asking about the teaching of leadership were organised by the Health LEADS Australia Domains [12] (*1. Leads Self, 2. Engages with Others, 3. Achieves Outcomes, 4. Drives Innovation, and 5. Shapes Systems*). As the Health LEADS Australia framework does not provide competencies, each of these five domains were further categorised with leadership and management competencies as described in the book 'Leading and Managing Health Services: An Australian Perspective' [21]. (See Table 1) Academics were asked to categorise at what level they believed the leadership competencies (skills) were taught in their medical degree, from *Not At All*, *Introduced*, *Reinforced*, and *Mastered* to determine the achievement of a specified competency, or as Harden (2009, pg678) states "the level of mastery of a subject area" [22]. Ethics approval was obtained through the JCU Human Ethics Committee (H6985).

### Data analysis

Data were entered into Microsoft Excel 2016. Data for closed questions (yes, no) and the ordinal data of each Likert scale response (*Not At All* covered, *Introduced*, *Reinforced*, and *Mastered*) were described via frequency analysis, with the Likert scale responses summarised in pie and bar graphs. A deductive analysis of the self-reported leadership competencies taught, was conducted using the Health LEADS Australia domain headings as coding categories, as described in Fig. 6. Content analysis of the free text responses to barriers to teaching, was undertaken by author SR and confirmed by authors TSG and PJ, using an inductive, iterative process to identify codes and categorise them into overarching themes. The frequencies of the responses are described in the results section and overarching themes are described in Fig. 7 [23]. For bivariate analysis comparing leadership competencies of undergraduate versus graduate entry, the data was imported into the computerised Statistical Package for Social Sciences (SPSS) release 23 for Windows (http://www.spss.com) and assessed using Student's t-tests. Frequencies are described in the results section.

## Results

Of the 23 medical degrees, three (13%) did not respond at all, one (4%) was removed at their own request as it is

**Table 1** Medical Leadership Domains and Competencies

| Health LEADS Australia Domains | Leads Self | Engages with Others | Achieves Outcomes | Drives Innovation | Shapes Systems |
|---|---|---|---|---|---|
| Leading and Managing Health Services: An Australian Perspective Competencies | Ethical decision making | Communication | Critical thinking and decision making | Creativity and visioning | Workforce planning |
| | Self-management | Inter-professional teamwork | Managing staff | Evidence-based practice and use | Strategic planning |
| | Emotional intelligence and self-awareness | Partnering with stakeholders | Project management | Successfully managing conflict | Health service planning |
| | Exploring values | Power in organisations | Financial management | Building positive workplace culture | |
| | Critical reflective practice | Networking | Negotiation | Leadership and management of change | |
| | | | | Quality and service improvement | |

a new degree and they felt it was inappropriate to participate, two (9%) gave no further details after the degree demographics, and one (4%) gave no further details after the question which asked 'do you teach leadership at your school' in which they reported that medical leadership was not currently taught in their degree (6%). Full surveys were completed for sixteen (73%) medical degrees. Nine of the 16 degrees (56%) are graduate entry only, seven (44%) undergraduate, and three (19%) are mixed with the entry dependent on whether the student is a graduate entry or school leaver.

The following section outlines the results for the medical leadership curricula survey, including: roles and responsibilities; leadership education; assessment and evaluation; overall barriers; and reported needs to integrate or assess leadership curricula.

## Leadership curricula

### *Roles and responsibilities*

Of the sixteen medical degrees teaching medical leadership, one (6%) degree has a standalone academic lead teaching leadership, eight (50%) have a lead that is combined with another role, seven (44%) do not have a lead. A variety of staff are responsible for delivering leadership training including: academic faculty (16, 100%); clinical faculty (11, 69%); hospital and health service staff – clinical (11, 69%); hospital and health service staff – educators (6, 38%); and external providers or third party leadership development consultants (4, 25%).

### *Leadership education*

Leadership teaching is taught as a common thread integrated throughout the entire curricula or across several subjects (11, 69%), via ad-hoc teaching (7, 44%), a specific module for all students (2, 13%), or a specific module as an elective (2, 13%). There are plans to introduce or make change to the curricula to integrate leadership more generally at 12 (71%) degrees; 2 (12%) are doing so within the next 6 months, 4 (24%) between six to twelve months, and 6 (35%) between one to 2 years. Students will have input into these changes via student-staff committees (14, 82%), medical student association input (13, 76%), student satisfactions surveys (10, 59%), and student focus groups (3, 18%).

Australian and overseas resources used to inform the leadership curricula of the degrees include:

- AMC Professionalism and Leadership Graduate Domain and Statement (Australia) 2012 [13] – 14 (88%)
- Good Medical Practice: A Code of Conduct for Doctors in Australia 2014 [24] – 13 (81%)
- Health Leads Australia Framework 2013 [12] – 5 (31%)
- Medical Leadership Competency Framework: Enhancing Engagement in Medical Leadership (NHS, UK) 2010 [25] – 2 (13%)
- CanMEDS: Better Standards, Better Physicians, Better Care (Canada) 2015 [26] – 2 (13%)
- Australian Commission on Safety and Quality in Health Care [27] – 1 (6%)
- Leading and Managing Health Services: An Australian Perspective 2015 [21] – 1 (6%)
- General Medical Council: Leadership and Management for Doctors (UK) 2012 [28] – 1 (6%)
- Kings Fund: Leadership and Leadership Development in Health Care (UK) 2015 [29] – 1 (6%)

Figures 1, 2, 3, 4 and 5 show a self-reported snapshot of what competencies are taught and at what level in Australasian medical courses. These figures show the variation of teaching within medical degrees with some clear strengths and gaps. For example, competencies that are taught at *Reinforced* or *Mastered* level for more than 50% of the degrees are: communication (100%); evidence-based practice and use (100%); critical reflective practice (94%); self-management (81%); ethical decision making (81%); critical thinking and decision making (81%); exploring values (75%); emotional intelligence and awareness (75%); interprofessional teamwork (75%); quality and service improvement (67%); building positive workplace culture (56%); and partnering with stakeholders (50%). Competencies covered by less than 50% of the degrees are financial management (20%), strategic planning (31%), and workforce planning (31%).

Fourteen (88%) medical degrees taught all competencies in *Lead Self*, 13 (81%) in *Engages Others*, two (13%) in *Achieves Outcomes*, and 13 (815%) in *Drives Innovation*. Of the 13 degree responses for *Shapes Systems*, two (15%) taught every leadership competency. One medical degree reported teaching every leadership competency across all domains of *Leads Self, Engages Others, Achieves Outcomes, Drives Innovation*, and *Shapes Systems*. Leadership teaching also was reported as not being taught in one medical degree. A comparison of leadership competencies for undergraduate entry versus graduate entry degrees did not reveal any statistical significance differences. However, no undergraduate entry degrees taught health workforce planning compared to four (44%) graduate entry degrees. Figure 6 shows an overview of what is taught and at what level in Australasian medical professional entry degree/programs.

The teaching methods used to deliver medical leadership education are diverse. So too are other opportunities outside the curricula for students to learn medical leadership. (See Table 2).

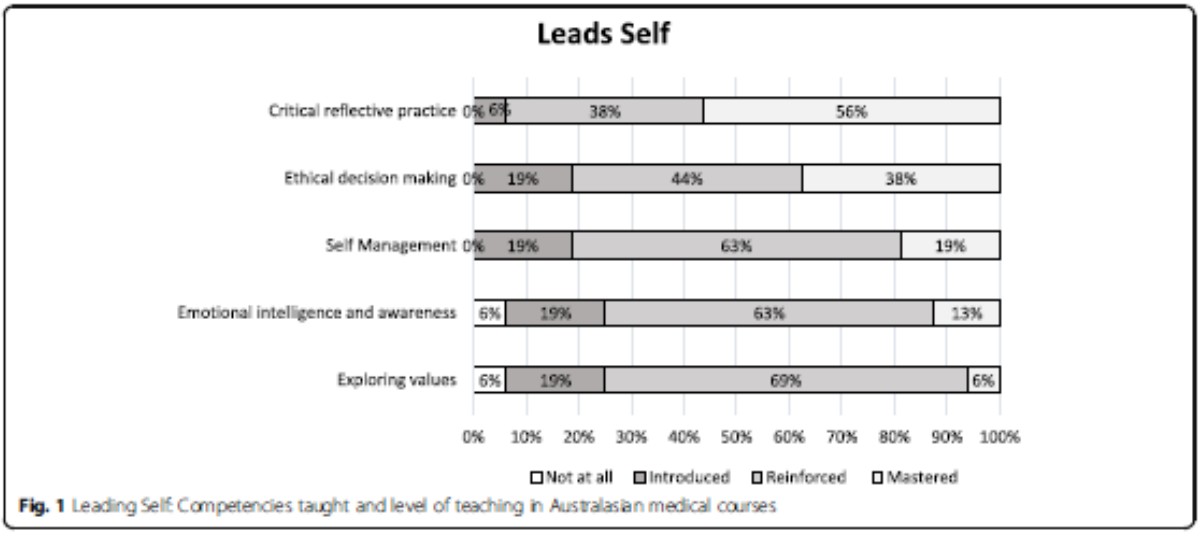


**Fig. 1** Leading Self: Competencies taught and level of teaching in Australasian medical courses

***Assessment and evaluation of leadership education***

Seven (41%) of the seventeen responses formally evaluate medical leadership teaching at their school. Barriers to evaluating student leadership competencies are described in the next section.

Ten (59%) of the seventeen responses formally assess medical leadership. (See Table 3). Four (44%) degrees also provide a faculty generated score of professional behaviour for students. Of the ten responses received, there was a variety of competencies assessed by multiple degrees including communication (6, 67%), quality and safety (3, 38%), and ethical practice (3, 33%).

A deductive content analysis of the competencies using the Health LEADS Australia domain headings [12] is found in Table 3. The below competencies assessed by domain are similar to the competencies taught in Fig. 6, with *Leads Self*, Engage *Others*, and *Drives Innovation* being taught and assessed more than *Achieves Outcomes* and *Shapes Systems*.

***Barriers to leadership education, assessment and evaluation***

All sixteen responses (100%) reported at least one barrier to integrating leadership material in the curriculum. The overarching themes shows the barriers varied, with the most common barrier being competition for teaching time in the curriculum (8, 47%). Other responses provided by more than one degree included a lack of national curricula or guidelines (6, 35%), timetabling (3,

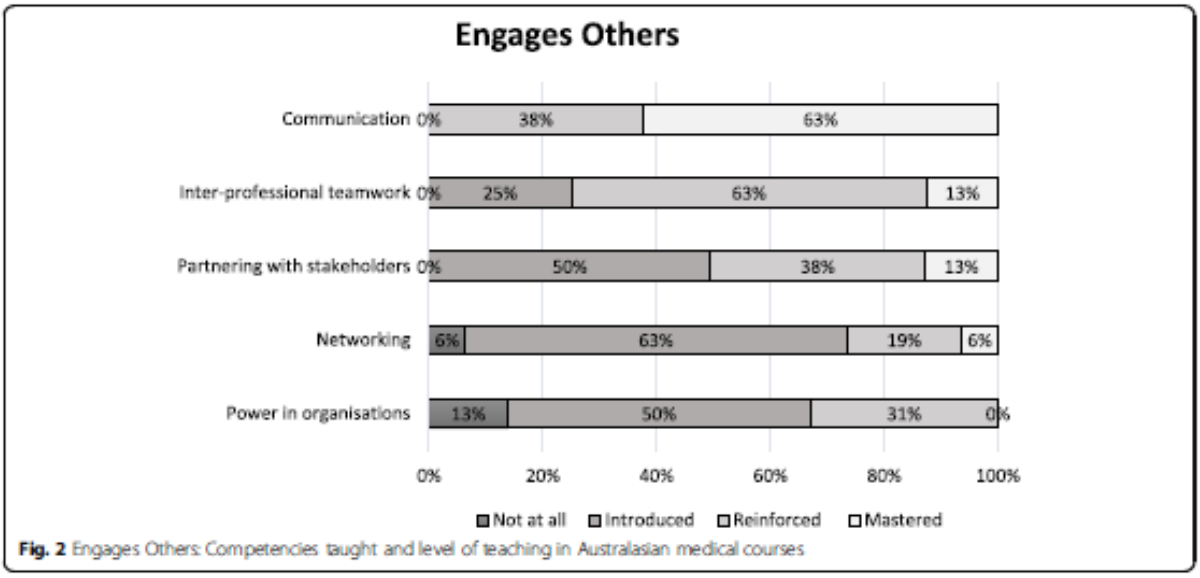


**Fig. 2** Engages Others: Competencies taught and level of teaching in Australasian medical courses

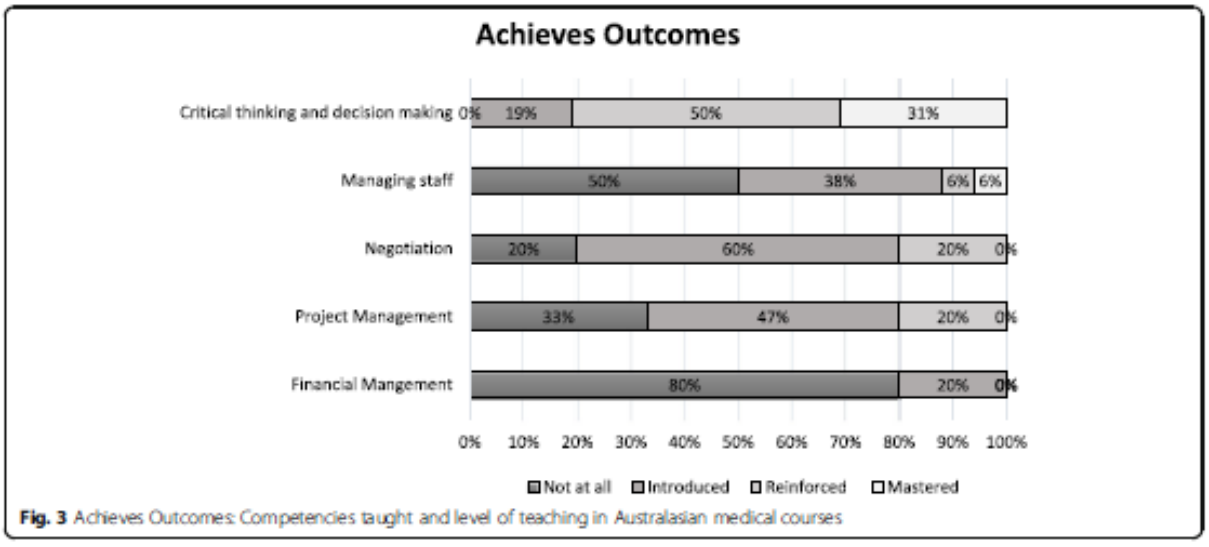


**Fig. 3** Achieves Outcomes: Competencies taught and level of teaching in Australasian medical courses

18%), a lack of expertise in teaching leadership (2, 12%) and/or a perspective the students are not yet mature enough to comprehend the significance of leadership (2, 12%).

All sixteen responses (100%) reported one or more barriers to assessing leadership in the curriculum. Responses provided by more than one degree to assessment barriers included: lack of formal teaching in the curricula (5,29%); lack of knowledge about how to teach and assess leadership (4, 24%); assumption that students already have leadership knowledge and do not need it taught or assessed (3, 18%); too many other assessments (2, 12%); the subjective nature of the content (2, 12%); lack of suitable assessment instruments (2, 12%); and lack of identified curriculum (2, 12%). See Fig. 7.

All sixteen (100%) responses reported one or more barriers to evaluating leadership competencies, with one (6%) response stating 'unsure'. Responses provided by more than one degree to evaluation barriers, included: lack of suitable evaluation instruments (3, 19%); time (3, 19%); pressure to evaluate other curricula components (3, 19%); not sure what competencies should be evaluated (2, 13%); and/or lack of leadership learning outcomes (2, 13%).

### *School-reported needs to integrate or assess leadership in the curricula*

There were sixteen responses to the question asking what support would be helpful for medical degrees to integrate or assess leadership in the curriculum (See Fig. 7). The overarching themes included: shared national teaching,

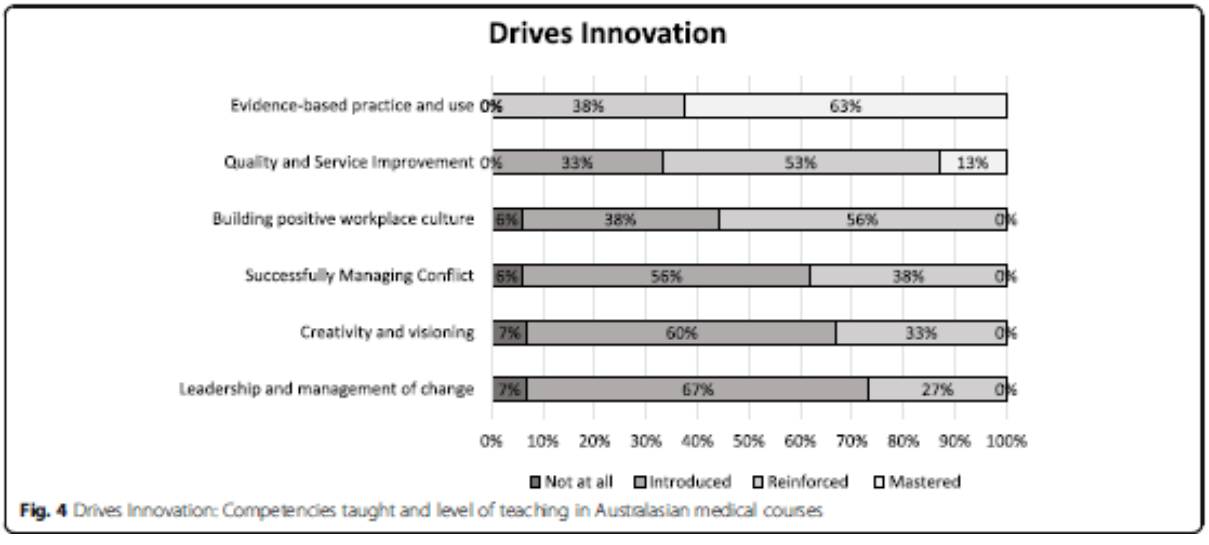


**Fig. 4** Drives Innovation: Competencies taught and level of teaching in Australasian medical courses

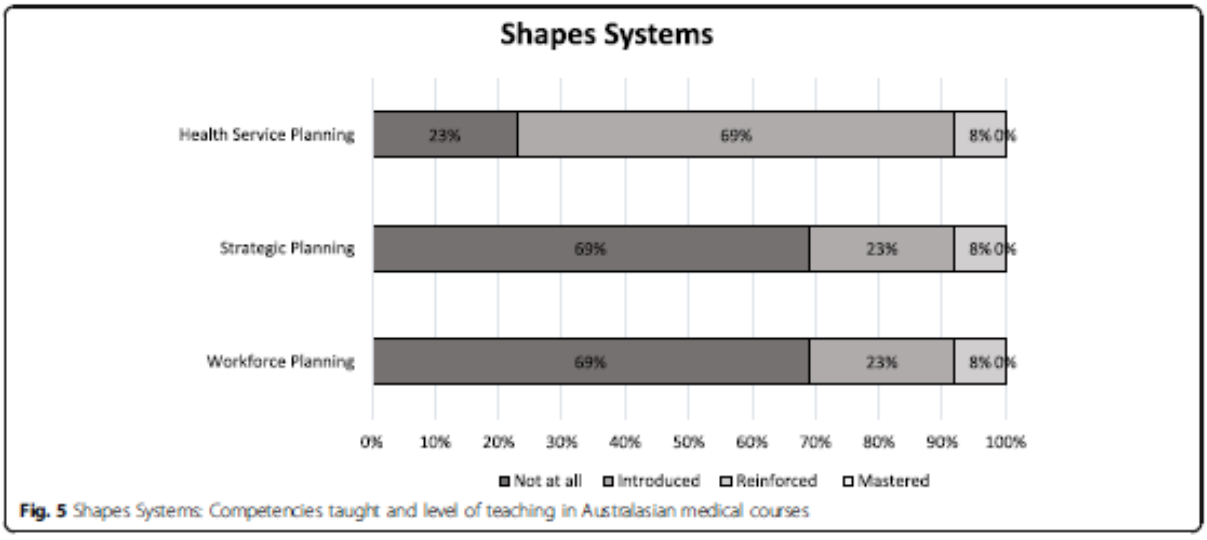


**Fig. 5** Shapes Systems: Competencies taught and level of teaching in Australasian medical courses

assessment and evaluation resources (11, 69%); agreed national curricula with learning outcomes (8,50%); more funding for staff to develop leadership programs (3, 19%); professional development for teachers on content and teaching (2, 13%); and renaming leadership education to leadership and management (1, 6%).

## Discussion

This is the first in-depth study into medical leadership teaching, assessment and evaluation practice in medical degrees in Australia and New Zealand. As the full survey was completed for 16 (73%) medical degrees these results give a fairly complete picture of leadership curricula. The findings are relevant for the AMC, agencies that teach leadership skills in clinical contexts, medical educators, clinical educators, academics, students, and the public.

Of the 17 degrees that completed survey questions beyond the demographic questions, one (6%) responded they do not teach medical leadership. Sixteen (94%) responded they teach leadership skills training, with formal leadership training occurring for more than three-quarters of these degrees. There is a wide diversity of staff delivering the education, such as academics, clinical staff and external providers or third party leadership development consultants, with students heavily involved in providing feedback for curricula change. Two-thirds of the schools have future plans to introduce or make changes to the curricula to integrate this topic more generally. However, overall, the assessment and evaluation of the medical leadership curricula is ad-hoc with only half assessing the leadership curricular content and only one-third evaluating it. This indicates for two-thirds of the Australasian degrees there is no continuous quality improvement occurring for leadership education.

With the recent leadership education findings from the UK [14], Australasian medical leadership education is on-par with the UK for teaching leadership (94% compared to 92%), evaluating the skills (42% compared to 48%), but is lower for assessment (59% compared to 75%) of these skills. Recent US findings [15], suggested leadership was taught far less commonly than in Australasian medical schools (54% compared to 94%) with no US data available to compare leadership skills evaluation or assessment. The systematic review by Webb et al., of leadership teaching in undergraduate medical education [17] found that most leadership curricula did not demonstrate student behaviour change, as often the curricula is taught without the use of a leadership framework and

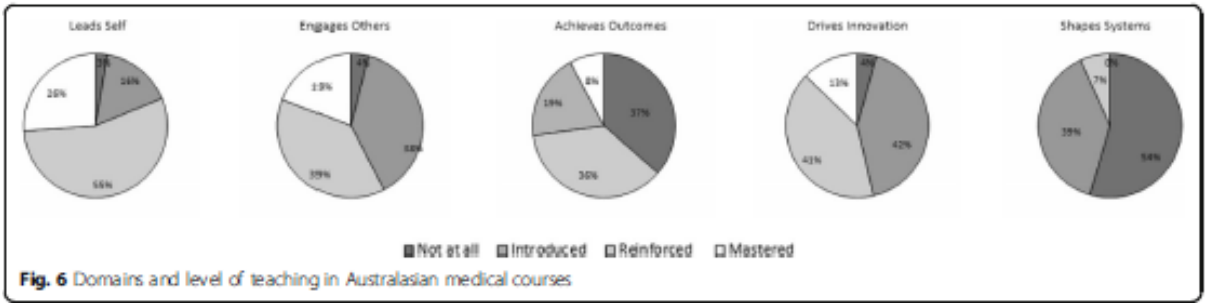


**Fig. 6** Domains and level of teaching in Australasian medical courses

**Table 2** Medical Leadership Teaching and Assessment Methods used in Australasian medical courses

| Medical leadership teaching methods in the curricula (*N* = 16) | Other opportunities outside the curricula for students to learn medical leadership (*N* = 16) | Formal assessment of medical leadership in the curricula (*N* = 10) |
|---|---|---|
| Small group seminars or workshops (14, 88%) | Student clubs and societies (14, 82%) | Reflective writing (10, 100%) |
| Experiential learning (14, 88%) | Peer-teaching (4, 24%) | Portfolio (6, 60%) |
| Lectures (11, 69%) | Scholarships (3, 18%) | Mini-CEX (6, 60%) |
| Problem-based learning (7, 44%) | Sitting on school committees (2, 12%) | Structured clinical assessments (e.g. OSCE) (5, 50%) |
| Student selected components (3, 19%) | Attending leadership conferences (2, 12%) | Presentations (5, 50%) |
| Opportunity for a selective subject (2, 12%) | Coursework overload study (2, 12%) | Written examinations (5, 50%) |
| Group project (1, 6%) | Mentoring (1, 6%) | Case-based discussions (4, 40%) |
| Case-based learning (1, 6%) | | |
| Student suggestions for a guest speaker (1, 6%) | | |
| Attending simulation sessions (1, 6%) | | |

without evaluating leadership competencies, and therefore is also lacking continuous quality assurance of the teaching and learning of students.

### Leadership competencies

The competencies in the survey were chosen to be relevant for medical leadership in the Australasian health service. For example, communication with patients require skills such as the ability to actively listen, problem solve, and be patient-centred. In contrast, leadership within the health service requires different communication skills including inter-professional communication of active listening, knowledge of the organisations communication protocols, when and how to use formal or informal communication, plus knowing how and when to have a difficult conversation with team members [30]. Lack of knowledge of these skills in the work environment can increase or create unhealthy working environments which impact on patient safety [9].

In most Australasian degrees, the current competencies taught at *Reinforced* or *Mastered* levels are providing a well-constructed student understanding of professionalism, which is the basis for a good leader and a good doctor. However, it appears that some of the key leadership competencies are rarely being taught. These include: leadership and management of change, successfully managing conflict, negotiation, project and financial management, and an understanding of power in an organisation. This means we are teaching students to lead themselves and engage with others, and to be an advocate, but we are not providing them with the knowledge and potentially the transformative leadership tools to fully drive innovation. An understanding of the underlying health needs and systems are vital if students are to drive a medical innovation. With appropriate leadership training, graduating students should be able to implement organisational based changes including building positive workplace culture, which creates a healthy working environment, and increases staff job satisfaction and the safety of patients [9, 31–33]. These are skills required for the rest of their career.

### Barriers and needs

The most common reported barrier to leadership education is teaching time in the curricula. Miller, Till and McKimm, 2018 [34], state that "*medical students, like all*

**Table 3** Domains and competencies assessed in Australasian medical courses

| Leads Self n (%) | Engage Others n (%) | Achieves Outcomes n (%) | Drives Innovation n (%) | Shapes Systems n (%) |
|---|---|---|---|---|
| Ethical practice (3, 33%) | Communication (6, 67%) | Critical thinking and decision making (1, 11%) | Quality and safety (3, 33%) | |
| Self-management (1, 11%) | Teamwork (1, 11%) | | Evidence based practice (1, 11%) | |
| Self-awareness (1, 11%) | | | Conflict Management (1, 11%) | |

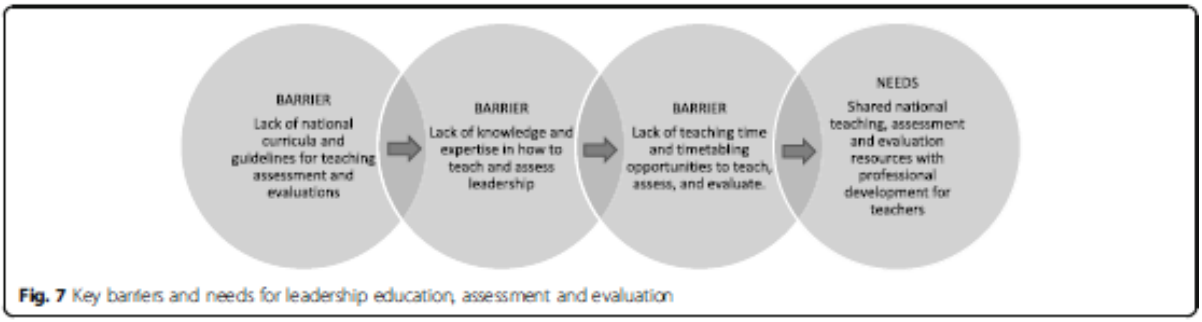


**Fig. 7** Key barriers and needs for leadership education, assessment and evaluation

*health-care professionals, can 'learn to lead' and they should be supported to do so, despite an already crowded undergraduate medical degree".* Based on further reported barriers, such as a lack of national curricula and a lack of expertise or knowledge to teach leadership, the authors recommend that academics should also be supported, nationally and locally, to develop resources and align content. There is a strongly reported need for shared national medical leadership teaching, assessment and evaluation resources with professional development for teachers. To assist with this change, the authors recommend a health leadership core curriculum and teaching methods with a leadership development real-world work integrated focus. This would align with other health teaching domains, such as professionalism [24], ethics [35], Indigenous health [36], as well as most health science disciplines [13]. The development of a core leadership curriculum and teaching methods requires a 'meeting of the minds' to discuss key competencies for medical leadership teaching, for both the professional development of academics and for the curricula knowledge and skills learning for students.

### Limitations

The UK tool used as a foundation for the survey had been designed for the UK undergraduate medical school context. While this has not been validated in the Australasian context, the survey questions were adapted to be more specific to Australasian medical education and the findings report similar results. The survey was administered twice over an eight-month period with one question re-sent to original survey recipients. This process occurred to ensure the appropriate member of faculty completed the data collection. Due to the high response rate (73%) with 16 of 22 eligible medical schools completing the full survey, the data was unlikely to be significantly affected by selection bias even though it was self-reported and survey responses were not triangulated with other curriculum documents or maps. This data was collected from primary medical programs and does not include data from students or clinical leadership training organisations, however data is currently being collected from these population groups.

## Conclusion

In the majority of Australasian medical degrees, medical leadership is being taught, but there is variability in the medical leadership training, evaluation and assessment in each degree. Competencies being taught at *Mastered* provide a good basis of professionalism in most medical degrees, but key leadership competencies of change management, conflict management, negotiation, managing staff and understanding power in an organisation are not. A meeting of minds to discuss a national medical leadership curricula is recommended.

This study builds on the limited knowledge regarding basic medical leadership education in Australasia. Added to the recent medical leadership curricula data from the UK [14] and US [15] and based on the health system reform models since the 1990s recommending leadership training for medical students [1–7], it is clear nationally and globally that requirements include evidence based guidelines for teaching medical leadership, with curriculum that is clear and transparent, linked to industry and future practice, and appropriately assessed and evaluated. Further, local recommendations should include professional development for teaching medical leadership. This provides the opportunity to build effective academic leadership in our teachers and provide students with the skills and knowledge for leadership roles in the future.

## Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12909-020-02456-z.

**Additional file 1.**

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### Authors' contributions

SR: Wrote the research protocol, developed the survey, analysed and interpreted the data, and drafted the manuscript. TSG: Supervised the research project, provided methodological support and provided manuscript editorial input. PJ: Supervised the research project, provided methodological support and provided manuscript editorial input. All authors have read and approved the manuscript.

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**Availability of data and materials**
All data generated or analysed during this study are included in this published article, and its supplementary information files.

**Ethics approval and consent to participate**
Ethics approval was obtained through the James Cook University Human Ethics Committee (H6985). All participants consented to complete the survey and for the data to be de-identified and published anonymously.

**Competing interests**
The authors declare that they have no competing interests.

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## Publisher's Note

## Appendix G.

## Manuscript: Medical Continuum Leadership Findings

Medical leadership training across the Australian medical education continuum: A mixed methods study of stakeholder perspectives

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Key Words:

Leadership, medical leadership, role model, medical education, clinician, graduate, health system, Australia, evaluation.

Abstract word count: 350 Manuscript word count: 7955

Figures: 4 Tables: 5

References: 71

### Abstract

**Background**

Most current medical leadership frameworks provide overarching recommendations for leadership for doctors (not medical students) but with no clear curricula, and limited evidence of why knowledge and skills are needed. This study aimed to investigate stakeholder perspectives of medical leadership roles and experience, formal and informal medical leadership training, assessment and experience, role model influences, and barriers and recommendations for medical leadership training.

**Methods**

This mixed-methods study was phase two of a multiphase study design involving a survey of James Cook University (JCU) medical graduates (postgraduate year 4+), a focus group with five medical training body executives, and individual interviews with four executive members of the national medical student society. Descriptive statistics examined JCU medical graduates' perceptions, while chi-squared test for trend and Students t-test assessed item scores in relation to graduate characteristics. Conventional content analysis was undertaken of free text responses from the survey and interviews/focus group of all participants.

**Results**

Fifty-eight percent of the JCU medical graduates surveyed (response rate = 34%) had experienced a leadership role, though only 47% reported experiencing formal leadership training and about a third of those with training were not assessed. Of all graduates who reported self-funding this leadership training external to medical education requirements (26, 16%), specialists were most likely to do so (P=0.018). However, informal leadership training was common across the medical continuum, with 90% reporting role models had influenced their leadership skills. The content analysis found participants identified many barriers to formal leadership training, including: workforce barriers (69,42%); ability to access formal leadership training (43,26%); relevance to current practice (38,23%); financial cost to training (24,14%); and leadership curricula requirements (27,16%).

**Conclusions**

The survey findings indicate less than half of JCU medical graduates received formal leadership training, but nearly all graduates received informal training via role models. With the mismatch of more medical graduates in leadership positions than having experienced formal training, likely due to the many significant barriers identified in the surveys and interviews, this study recommends formal leadership training be systematically introduced throughout the medical education continuum, including for role models. Examples for Transformative Leadership training are provided.

**Background**

Transformative leadership is well recognised to increase work satisfaction and team performance in doctors and nurses, consequently improving patient quality of care and health outcomes.[1-6] In the healthcare setting, transformative leaders as role models demonstrate ethical medical values, skills and knowledge while coaching and mentoring as required. Health system reform models have encouraged medical leadership training for both medical students and doctors since the early 1990s.[7-13] Leadership training helps to produce role models [1,14,15] inspiring followers "to perform beyond expectations while transcending self-interest for the good of the organisation" [pg423.16] Doctors, particularly in rural and remote settings, are expected to be leaders in the health care setting and community.[12,13] Clinicians leading in the community identify and set direction for community health needs, and build partnership in the local community, industry, and government to advocate for health system change. If clinicians are not well trained in leadership, they may be "operating outside their scope of practice and beyond their professional knowledge and skill base".[17]

**Leadership training across the medical education continuum**

In Australia, the medical training continuum comprises medical students, junior doctors, prevocational doctors, and senior clinicians. Transition to the phase of junior doctor occurs after graduation from medical school. Transitions between the phases of junior doctor to senior clinician are not distinct. Junior doctors as interns are heavily supervised (and this prevocational internship period can be extended for a second year). Upon satisfactory completion of the internship year, general registration is gained. Although some doctors go straight into specialty training, many gain additional hospital training experience for one or more years, and some doctors choose not to become a specialist. After graduation, doctors undertake a program of continuing professional development (CPD) depending on their level and specialty. Junior doctors as interns complete a CPD education and training program provided by their hospital set to their education level, whereas general practitioners and specialists complete the CPD requirements as prescribed by their relevant medical college for each specialty in which they hold specialist registration. Most College programs incorporate leadership training, but it

is voluntary rather than mandatory. The Medical Board of Australia defines CPD as "the means by which members of the profession maintain, improve and broaden their knowledge, expertise and competence, and develop the personal and professional qualities required throughout their professional lives" [p4.18] No national strategy or set of leadership learning outcomes or educational resources are provided for clinical doctors, and there is no framework to standardise medical leadership learning or evaluation in Australia.

**Evaluation of medical leadership programs**

There is limited information in the research literature on clinical leadership education, assessment, and evaluation [19] in Australia. Two clinician training programs have published evaluations of their clinician leadership training programs. Crethar et al.,[20] in 2011 evaluated the Australian Queensland Health Leadership Training Program in three stages (2006/2007, 2007/2008, and 2008/2009). They evaluated the training objectives of their program using the Kirkpatrick evaluation model,[21] describing how they transformed their program from a broad organisational leadership development to be more customised to address the needs of the participants and their teams.

Bond and Chong in 2020[22] evaluated the development and delivery of the Rural Generalist Leadership for Clinicians Training Program to determine participants' ability to apply program learning in a rural leadership context. Their method of evaluation was a pre- and post-evaluation program survey to develop person-specified program course material and then overall program feedback. Surveys were also conducted pre- and post- every workshop to rate participant knowledge of the domains covered in the workshop. After graduation, participants were invited to participate in a post-program phone interview. Their findings identified the program predominantly addressed level 3 of Kirkpatrick's model[21] with knowledge acquisition and positive behaviour change in the workplace. In addition, transformational leadership is evident in both their individual and collective graduates, particularly in the development of a community of practice. Participants who complete this Program are eligible to apply for their Associate Fellowship of the Royal Australasian College of Medical Administrators (AFRACMA) and access ongoing professional development from the Royal Australasian College of

Medical Administrators (RACMA) as the specialist college providing "education, training, knowledge and advice in medical management".[23] Members who complete RACMA's training become a Fellow (FRACMA) and are often seeking to be, or are working in, senior leadership and /or medical management positions. No evaluation of RACMA's leadership training programs could be located publicly or in the research literature.

Due to the limited medical leadership training information available in Australia, the aim of this study was to explore the medical leadership roles, training, experiences, barriers, and recommendations of medicine graduates (doctors) from James Cook University (JCU), Australian medical student society leaders, and specialist trainers across the medical education continuum from junior doctor to specialist. This paper describes the results of a medical leadership survey for doctors and the focus group results of medical student society leaders and specialist trainers. The following medical leadership topics were explored:

1. Availability of medical leadership roles
2. Formal or informal leadership experience in a medical leadership role
3. Formal medical leadership training and assessment
4. Formal or informal extra-curricular leadership learning
5. The influence of role models and how they benefit their mentors
6. Barriers to medical leadership training across the medical continuum
7. Recommended changes to medical leadership training

## Methods

### Context

Within this study a medical student refers to a student enrolled in a university medical degree with a graduating qualification permitting the holder to seek general registration as a medical practitioner (but does not refer to specialist postgraduate training). A junior doctor refers to a graduate in their first to third post-graduation year (PGY1-3), such as a graduate doctor of a medical degree who is an intern

(first year out) or is undertaking prevocational training (a specialist in training) and/or a doctor who holds general registration (second and third year out). A senior clinician refers to a doctor four years or more post graduate (PGY4+) from their primary medical degree holding either general registration or specialist registration.

**Setting and Study Design**

This is the second phase of a multiphase study[24] designed to explore the current situation in Australia with respect to medical leadership training. Ethical approval was granted by the JCU Human Research Ethics Committee (H6985 and H8411). An integrative review of medical leadership education, gaps in the literature, and a review of global medical leadership frameworks was conducted.[25] Then, the first phase was a survey of leadership curricula and assessment in Australian and New Zealand medical schools.[26] This second phase was designed to build on the previous two phases. These findings were used to determine if the current training is sufficient and effective across the existing medical education and training continuum from medical student to senior clinician. Using the above findings, the third phase of this study has produced a Medical Student Leadership (MedStudentLead) Framework for use in Australian medical schools.

This concurrent mixed-method study purposefully includes three levels of data designed to advance the knowledge, understanding and practice of medical leadership training across the medical education continuum in Australia. The sources of data collected for this study include:

- Individual interviews with Australian Medical Student Association (AMSA) executives in 2020. AMSA is the peak representative body for medical students in Australia.[27]
- A focus group with Queensland Rural Generalist Program (QRGP) executives in 2020. QRGP support training for the rural generalist medicine discipline [28]; and
- A cross-sectional online survey with 2005 to 2018 JCU MBBS graduates in 2021.[29]

**Qualitative Interviews with AMSA and QRGP**

***Interviews with AMSA and QRGP***

AMSA were selected as they represent and advocate for Australian medical students and their teaching requirements.[27] Initial email contact occurred with the 2020 Senior AMSA Volunteer, who then emailed executives and asked them to contact the primary researcher (SR) for an interview if they were interested. AMSA participants (n= 4) volunteered to complete an interview at a convenient time. Four of the five (80%) members of AMSA Executive team with a significant leadership portfolio were interviewed. Of these four AMSA participants, all four came from different medical schools in three states. Two were senior medical students and two were graduates who took their intern year off to volunteer as an AMSA Executive.

QRGP were selected as a medical training body with a clear focus on teaching leadership skills.[28] QRGP partners with Clinical Excellence Queensland[30] and the RACMA for two separate clinical leadership programs for their fellows.[31,32] Initial email contact occurred with the Manager of QRGP with approval obtained from the Medical Director. QRGP executives and teachers preferred a focus group over individual interviews at a time suitable for all volunteer participants (n=5). Five past and present executives of QRGP (100%) attended the focus group. Of these five QRGP participants, three out of four had RACMA qualifications, and two were continuing RACMA members.

Semi-structured interviews and focus group were conducted in 2020 via Zoom[33] in May and June (AMSA) and November (QRGP). Both were recorded live. During each interview and focus group, the interviewer guide and researcher notes were screenshared for participant transparency. The Zoom recordings were uploaded into NVivo Transcription,[34] producing naturalised transcripts (reflecting each word said).[35] For digital NVivo transcriber accuracy, each transcript was checked and edited against the recording by the primary researcher (SR).

***Trustworthiness of data***

To explore the credibility of results, this manuscript was shared with two of the five QRGP Executive participants online via Zoom. The results were confirmed, no recommendations were made and consensus of all but one content analysis sub-theme was validated. Due to the volunteer nature of AMSA, the participants were unable to meet to explore the credibility of the results. This manuscript

was shared face-to-face with a 2023 senior volunteer who agreed the results and recommendations were realistic.

**Quantitative Survey of JCU MBBS Graduates**

Consent for further contact of JCU MBBS graduates was collected online via an annual exit survey of final-year students, which has been conducted since 2005 and includes a request for contact email and mobile phone details of students who wish to be contacted as graduates for further studies. This study targeted more senior doctors from PGY4+ due to their experience in the workforce. Due to sending out the survey late in the year, PGY3+ graduates were also included as it was at the end of their PGY3 year, and these graduates were transitioning into PGY4. Overall, 933 students of the total 1644 graduates in the cohorts between 2005 and 2018 provided consent to be contacted for further research; email messages bounced back from 74, and 249 did not open their email, leaving 610 (65%) graduates contactable. The survey was administered in November and December 2021 via SurveyMonkey.[36] Participant demographics of gender, state and territory of practice, and practice rurality (Modified Monash Model [37]), was identified by accessing the Australian Health Practitioner Regulation Agency website.[38]

**Interview and Survey Questions**

Questions were purposefully asked of participants based on their active role in the medical education continuum. For example, AMSA, as medical students, were not asked about any experience in a medical leadership role in practice. QRGP, being medical leadership training executives, were not asked their role model influences in practice (see Figure 1 under Data Triangulation below). Questions explored the following leadership areas:

- AMSA, QRGP, and JCU graduates:
    - Potential barriers experienced or anticipate experiencing in formal leadership training
    - Changes they would like in medical leadership training across the continuum from medical student to senior doctor
- AMSA and JCU graduates:

    - Outside of medicine any formal leadership training and types of leadership skills taught
    - Any formal leadership training, the teaching methods and competencies assessed.
    - How role models influenced their leadership skills
- JCU graduates only:
    - Current or previous medical leadership role
    - Opportunities available to experience medical leadership training

**Analysis**

**Survey of JCU medical graduates**

Data for the graduate closed questions were coded numerically and entered into the computerised Statistical Package for Social Sciences (SPSS) release 23 for windows.[39] Free text responses were extracted into NVivo release 1.5.1 for windows[34] for content analysis. Independent samples t-test were used to determine if graduates' self-reported role model influence was associated with rurality of practice location. Chi-squared tests for trend were used to determine if graduates' self-reported medical leadership role, role model impact, or any formal leadership training had significant associations ($p<0.05$) with their gender, or stage of postgraduate training.

The category for 'current practice' was re-categorised using the participants' job titles into specialist, general practitioner specialist, specialist in training, junior doctor and 'other', as follows:

- Specialist: Private specialist, public specialist, both private and public specialist, if not already categorised as a GP by job title. Note: Participants who were already a specialist doing additional training were categorised as specialist or general practitioner specialist. This is consistent with the Health Practitioner Regulation National Law Act – Guidelines for the Recognition of Medical Specialties and Fields of Specialty Practice (2018) list of 'protected titles'. For example, a person can only use the title of medical specialist if they are "registered in a recognised specialty in the medical profession"(p115)[40]:

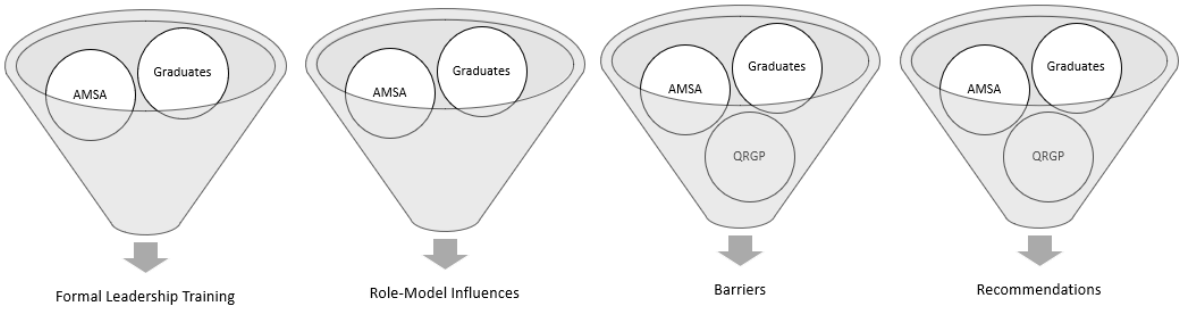
- General Practitioner Specialist: GP's and rural GP's
- Specialist in training: Specialist in training, if not already categorised as a specialist
- Junior doctor: Junior doctor, plus current practice specialty training if not already categorised as a specialist or general practitioner specialist
- Other: hospital non-specialist, locum, educator, temporarily not working, not currently practicing, and other

'Modified Monash Model' categories,[37] (MM1 Metropolitan, MM2 Regional Centre's, MM3 Large Rural Town, MM4 Medium Rural Town, MM5 Small Rural Town, MM6 Remote Community, and MM7 Very Remote Community) were dichotomised into MM1 (Metropolitan) versus MM2-7 (non-Metropolitan).

**Content analysis of open-ended responses of graduates, AMSA and QRGP**

Data triangulation was undertaken for all participant open-ended questions via conventional content analysis of the informative free text responses.[41] All four questions were asked of each participant group (graduates via survey, and AMSA and QRGP via interview), except for the question on role models as this question was not appropriate for the QRGP leadership program (see Figure 1 and Interview and Survey Questions section).

**Figure 1: Stakeholder data triangulation of open-ended questions**




A conventional content analysis approach is most appropriate when existing literature on a subject is limited.[41] In this instance, the primary author (SR) with review by secondary authors (PJ and TSG)

used an inductive, iterative process to define codes from the data and categorise them into overarching themes. For each theme, the number of respective stakeholder responses were counted and the impacts of current medical leadership across the continuum described. All responses were analysed with a decision to develop a theme or sub-category if there were three or more responses. Each example participant quote was selected within the themes and sub-categories to give a broad overview of the theme content. These illustrative quotes in the additional files tables 1 to 4 and in the results below were reported verbatim and each participant is depicted using the participant group: A for AMSA; Q for QRGP; JD for Junior Doctor, ST for Specialist in Training, GP for General Practitioner, or SP for Specialist for JCU medical graduates.

Each participant was also assigned a unique identifier number and a code that represented their method of data collection (i.e., FG for focus group, I for interview, or S for survey). Gender was also added to the graduate responses, but not to QRGP and AMSA participants to maintain their confidentiality. For example, 'A,I-4' indicates AMSA participant, interviewed, assigned number 4. Whereas for graduates, 'JD,F,S-126' indicates a graduate who is a junior doctor, female, surveyed, and assigned number 126. The frequencies of the responses and overarching themes are described in the results section.

## Results

### Survey of JCU Medical Graduates

Surveys were returned by 206 respondents, and this yielded an effective response rate of 34% (206/610). One graduate case was removed due to being incomplete (n=205).

#### *Demographics and descriptive analysis of JCU graduates*

See table 1 for demographics of the JCU medical graduates. At the time of the survey (2021) most graduates were practicing in Queensland (153, 74%), with smaller numbers in other states, including New South Wales (18, 9%) and Victoria (11, 5%). One graduate was practicing overseas. With the overseas graduate removed (n=204), the rurality of the practice location of the graduates using the

Modified Monash Model categories were: MM1 (97, 47%); MM2 (79, 39%); MM3 (3, 2%); MM4 (13, 6%); MM5 (4, 2%); MM6 (6, 3%) and MM7 (2, 1%). After recategorisation, the practice location categories are MM1 Metropolitan (97, 47%) and MM2-7 Regional Centre's, Rural Towns, and Remote Communities (107, 53%), consistent with other JCU medical graduate outcome studies.[42]

**Table 1: Demographics of JCU medical graduates**

| **Gender (n=204)** | **N (%)** |
|---|---|
| Male | 81 (40%) |
| Female | 123- (60%) |
| **Graduates across graduation years (n=204)** | |
| 2005-2009 | 71, (35%) |
| 2010-2014 | 55, (27%) |
| 2015-2018 | 78, (38%) |
| **Stage of Training (n=204)** | |
| Junior Doctor | 19, (9%) |
| Specialist in Training | 51, (25%) |
| General Practitioner Specialist | 64, (32%) |
| Specialist | 63, (31%) |
| Other | 7, (3%) |
| **Rurality* (n=204)** | |
| MM1 | 97 (47%) |
| MM2-7 | 107, (53%) |

* One graduate was overseas and cannot be matched by MM.

*JCU Graduates' Experience in a Medical Leadership Role*

Two hundred and three graduates responded to the question 'are you currently or have you previously been in a medical leadership role'. There was no significant difference ($p = 0.400$) by gender regarding leadership role experience, with female graduates (68, 58%) reporting having 'previously or currently been in a medical leadership role' as a medical student, junior doctor, or senior doctor compared to male graduates (49, 42%). The proportion of graduates reporting having 'previously or currently been in a medical leadership role' was only slightly different between graduates working in regional, rural, and remote settings (MM2-7) (107, 52%), compared to working metropolitan (MM1) (97, 48%).

*JCU Graduates' Formal Leadership Training*

One hundred and sixty-four graduate respondents selected a mix of options for the question 'have you undertaken formal leadership training': 77 (47%) advised they had formal leadership training, 61 (37%) had on-the-job training only, 22 (13%) had no formal training, 3 (2%) reported on-the-job and formal training, and 1 (1%) selected on-the-job and no formal training.

Of the twenty-three graduates (14%) with no formal leadership training, 20 (87%) self-identified they had 'no opportunity to experience medical leadership training', and three (13%) 'chose not to complete the training'. Five (22%) were junior doctors, five (22%) were specialist-in-training, 10 (43%) were general practitioners, one (4%) was a specialist, and two (9%) are in the category of other.

For those with formal leadership training, 79 (39%) graduates described multiple formal teaching methods including: a common thread carried throughout an entire curriculum or across several subjects (33, 42%); a specific module undertaken by all students (20, 25%); a specific module undertaken as an elective (20, 25%); and ad-hoc (30, 38%). As expected, these same 79 graduates selected multiple types of formal teaching methods used to deliver their formal medical leadership education. For formal assessment types, twenty-four (30%) of these 79, responded they had 'no assessment as part of their formal leadership education'. The other 49 (70%) graduates selected multiple types of formal assessment types. Table 2 provides a summary of participant stated formal medical leadership teaching methods and assessment types.

**Table 2: Proportion of JCU Medical Graduates reported experience of formal medical leadership teaching methods and assessment types.**

| **Formal teaching methods to deliver medical leadership** | **Formal medical leadership assessment approaches** |
|---|---|
| Small group seminars or workshop (65, 82%) | Feedback tutor (27, 34%) |
| Lectures (44, 55%) | Reflective writing (23, 29%) |
| Problem based learning (40, 51%) | Case-based discussion (21, 27%) |
| Experiential learning (29, 37%) | Feedback multisource (17, 22%) |
| | Presentation sessions (16, 20%) |
| | Project report (15, 19%) |
| | Mini-CEX (11, 14%) |

| | |
|---|---|
| | Structured clinical assessment (e.g. OSCE) (11, 14%) |
| | Portfolio (10, 13%) |
| | Written examination (8, 10%) |
| | Logbook (7, 9%) |
| | Audit report (3, 4%) |
| | Professional behaviour score (3, 4%) |

Fifty-two graduates from junior to senior clinician reported starting or completing multiple types of formal medical leadership training courses. Only those specific to medicine and provided by three or more graduates (43, 83%) were provided below as key Australian medical leadership training. These include:

- Postgraduate training body – 16 (37%)
    - Clinical Excellence Queensland at Queensland Health – within six different current or previous leadership programs30 – 12 (28%)
    - Queensland Rural Generalist Pathway28 – 4 (9%)
- Australian University postgraduate medical leadership degree or subject – 14 (33%)
- Specialist colleges – 13 (30%), including:
    - Royal Australasian College of Medical Administrators23 – 6 (14%)
    - Royal Australian College of General Practitioners43– 4 (9%)
    - Australian College of Emergency Medicine44 – 3 (7%)

*JCU Graduates' Informal Leadership Training via Role Models*

One hundred and twenty-three graduate doctors responded to the question 'have you had any role models influence your leadership skills'. One hundred and eleven (90%) answered yes, with twelve (10%) answering no. See table 3 for the overall proportions.

**Table 3: Proportions of JCU medical graduates reporting role models have influenced their leadership skills**

| **Role- models have influenced my leadership skills?** | Yes | No |
|---|---|---|
| **Gender (n=123)** | | |
| Male (47, 38%) | 43 (91%) | 4 (9%) |

| | | |
|---|---|---|
| Female (76, 62%) | 68 (89%) | 8 (11%) |
| **Rurality* (n=122)** | | |
| MM1 (53, 43%) | 48 (91%) | 5 (9%) |
| MM2-7 (69, 57%) | 63, (91%) | 6 (9%) |
| **Stage of Training* (n=120)** | | |
| Junior Doctor (5, 4%) | 4, (80%) | 1, (20%) |
| Specialist in Training (32, 26%) | 29, (91%) | 3, (9%) |
| General Practitioner (38, 31%) | 32, (84%) | 6, (16%) |
| Specialist (45, 37%) | 43, (96%) | 2, (4%) |
| **Had formal leadership training (n=123)** | | |
| No training (2, 2%) | 2, (100%) | |
| On-the-job only (50, 41%) | 42, (84%) | 8, (16%) |
| Formal Training (68, 55%) | 64, (94%) | 4, (6%) |
| Both on-the-job and formal training (3, 3%) | 3, (100%) | |

* One graduate was overseas and cannot be matched by MM. Two participants categorised as 'other' were purposefully removed from this table.

These above gender and rurality percentages are in similar proportions with the demographics of overall graduate participants. There is no difference by gender (male 91%, compared to female 89%), nor by rurality of practice (MM1 91%, compared to MM2-7 91%) regarding role models who have influenced graduates' leadership skills. There was a strong trend, but no significant difference between the proportion of specialists (96%) in reporting role models have influenced their leadership skills as compared to junior doctors (80%), specialist in training (91%) and general practitioners (84%).

### *Bivariate analysis*

#### *JCU Graduates' Experience in a Medical Leadership Role*

One hundred and eighteen graduates (57%) self-identified they had currently or previously been in a medical leadership role, with 86 (42%) graduates advising they had never experienced working in a medical leadership role. As expected, many of the 118 graduates with leadership role experience selected more than one response for the stage of training they held a leadership role (157 responses in total) (Table 4). Of the 57% who had, the results showed (as was expected) the more advanced they became in their stage of training, the greater they were likely to have experience in a leadership role. For example, compared to 'all other' practice categories, specialists were significantly more likely to experience a medical leadership role ($p = <0.001$) as a senior doctor, and specialists in training more

likely (though not significantly) to experience a leadership role ($p = 0.076$) as a junior doctor. Although not significant, the results portrait a trend of junior doctors ($p = 0.086$) and specialists in training ($p=0.076$) being more likely to experience leadership roles as a junior doctor, compared to when general practitioners ($p = 0.099$) and specialists ($p = 0.256$) were junior doctors.

**Table 4: Stages of training JCU medical graduates (*N=196) had experience in a medical leadership**

| **Experience in a medical leadership role…** | **Junior Doctor 17 (9%)** | **All other practice categories 186 (91%)** | **p-value*** | **Specialist in Training 51 (25%)** | **All other practice categories 152 (75%)** | **p-value*** | **General Practitioner 65 (32%)** | **All other practice categories 138 (68%)** | **p-value*** | **Specialist 63 (31%)** | **All other practice categories 140 (69%)** | **p-value*** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| …never (86, 42%) | 10(59%) | 76(41%) | .151 | 25(49%) | 61(40%) | .266 | 31(48%) | 55(40%) | .292 | 15(24%) | 71(51%) | <.001 |
| …in Medical School (25, 12%) | 2(12%) | 23(12%) | .942 | 6(12%) | 19(12%) | .890 | 11(17%) | 14(10%) | .170 | 6(9.5%) | 19(14%) | .417 |
| … as a Junior Doctor (49, 24%) | 7(41%) | 42(23%) | .086 | 17(33%) | 32(21%) | .076 | 11(17%) | 38(27%) | .099 | 12(19%) | 37(26%) | .256 |
| … as a Senior Doctor (83, 40%) | n.a. | - | - | 12(23%) | 71(46%) | **.004** | 28(43%) | 55(40%) | .663 | 43(68%) | 40(29%) | **<.001** |

* Two-sided chi squared test. Two junior doctors did not complete these questions. Participants categorised as ‘other’ were purposefully removed from this table.

Table 5: Stage of training JCU medical graduates *(N=159) had experienced formal leadership training

| Undertaken formal leadership training… | Junior Doctor 14(8%) | All other practice categories 150 (92%) | p-value* | Specialist in Training 41 (25%) | All other practice categories 123 (75%) | p-value* | General Practitioner 54 (32%) | All other practice categories 110 (68%) | p-value* | Specialist 50 (30%) | All other practice categories 114 (70%) | p-value* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| …in Medical School Curricula (12, 7%) | 0 | 12(8%) | .272 | 2(5%) | 10(8%) | .489 | 7(13%) | 5(4%) | **.052** | 1(2%) | 11(10%) | .083 |
| …in Medical School Extra-Curricular (8, 5%) | 0 | 8(5%) | .376 | 0 | 8(6%) | .094 | 7(13%) | 1(1%) | **<.001** | 1(2%) | 7(6%) | .257 |
| … as a Junior Doctor (33, 20%) | 3(21%) | 30(20%) | .899 | 10(24%) | 23(19%) | .431 | 9(17%) | 24(22%) | .439 | 8(16%) | 25(22%) | .383 |
| … at a Specialist College (45, 27%) | 1(7%) | 44(29%) | **.075** | 6(15%) | 39(32%) | **.034** | 16(30%) | 29(26%) | .660 | 22(44%) | 23(20%) | **.002** |
| … Self-Funded Generic Training (26, 16%) | 0 | 26(16%) | .089 | 6(15%) | 20(16%) | .805 | 6(11%) | 20(18%) | .244 | 13(26%) | 13(11%) | .018 |
| … Never (23, 14%) | 5(36%) | 18(12%) | **.015** | 5(12%) | 18(15%) | .697 | 10(18%) | 13(12%) | .246 | 1(4%) | 22(19%) | **.003** |

* Two-sided chi squared test. Participants categorised as ‘other’ were purposefully removed from this table.

*JCU Graduates' Formal Leadership Training*

Of the 80 (49%) graduates who reported they had formal leadership training, graduates selected more than one response for the stage of training they completed formal leadership training. Table 5 shows, as expected, specialists in training ($p = 0.034$) and specialists ($p= 0.002$) were significantly more likely to have undertaken formal leaderships training at a specialist college than all other practice categories. However, the results do show less than half of specialist's complete formal leadership training at their specialist college, with almost a third of specialists self-funding generic formal leadership training ($p = 0.018$); more than all other practice categories. Interestingly, Table 5 also shows general practitioners had a strong trend to undertake formal leadership in the medical school curricula ($p = 0.052$) (though not significantly) and it is significantly more likely for them to undertake extra-curricular formal leadership training while at medical school ($p = <0.001$). As expected, junior doctors were significantly less likely to undertake formal leadership training than all other practice categories ($p = 0.015$).

Of the 64 graduate respondents who reported having on-the-job formal leadership training, there were 32 (50%) graduates in each category of MM1 versus MM2-7. As expected, many of the 64 graduates selected more than one response for the stage of training in which they experienced on-the-job formal leadership training (Table 6). Graduates working in regional, rural and remote settings (MM2-7) compared to working metropolitan (MM1) setting who have experienced formal leadership training were significantly more likely to report undertaking 'formal leadership training in the medical school curriculum' ($p = 0.009$) and have a strong trend (although not significant) to undertaking 'formal leadership training during specialist medical college' ($p = 0.085$).

**Table 6: Current rurality of JCU medical graduates (N=163) who had experienced on-the job formal leadership training**

| Undertaken on-the-job formal leadership training… | MM1 (72,44%) | MM2-7 (91,56%) | p-value* |
|---|---|---|---|
| …in Medical School Curricula (12, 7%%) | 1(1%) | 11(12%) | **.009** |
| …in Medical School Extra-Curricular (7, 4%) | 2(3%) | 5(5%) | .396 |
| … as a Junior Doctor (33, 20%) | 12(17%) | 21(23%) | .312 |
| … at a Specialist College (45, 28%) | 15(21%) | 30(33%) | **.085** |
| … Self-Funded Generic Training (26, 16%) | 9(12%) | 17(19%) | .284 |
| …Never (23, 14%) | 11(15%) | 12(13%) | .703 |

* Two-sided chi squared.

## Content Analysis

*Formal Leadership Training Barriers – JCU Graduate Doctors, AMSA, and QRGP*

One hundred and sixty-four (80%) graduate participants responded to the free text question, 'potential barriers experienced or anticipate experiencing regarding formal leadership training', while all four AMSA participants discussed potential barriers to leadership within their interviews, same as all five of the QRGP executives within the focus group. The barriers described were from all three participant groups. See Figure 2 below. More detailed information can be found in Additional File 3.

There are six over-arching themes with 17 sub-themes:

1. Workforce barriers (69 responses) with three sub-themes
2. Time barriers (48 responses)
3. Little access to formal leadership (43 responses) with five sub-themes
4. Relevance to current practice (38 responses) with three sub-themes
5. Financial cost of training (24 responses)
6. Leadership curricula requirements (27 responses) with four sub themes

The barriers of workforce, time, access to training, and financial cost were discussed by graduates within their practice experience.

> “Time away from clinical work (shortages of staff).” (GP,F,S-118)
>
> “Relevance of specific training to the Individuals workplace / sphere of influence.” (SP,M,S-108)
>
> “Juggling multiple extra-curricular pursuits whilst working and studying.” (GP,F,S-131)
>
> “I would consider completing the RACMA Leadership for Clinicians, but the course fee was excessive, similarly with other non-clinician-based leadership and management courses - especially where I have to take time out of private practice to attend.” (JD,F,S-122)
>
> “Lack of CPD/ procedural grants that will fund this kind of training.” (JD,F,S-161)
>
> “Accessing training from a rural area.” (SP,M,S-88)
>
> “There aren't any formal courses I'm aware of that are tailored to medical leadership, specifically within my specialty.” (GP,M,S-95)

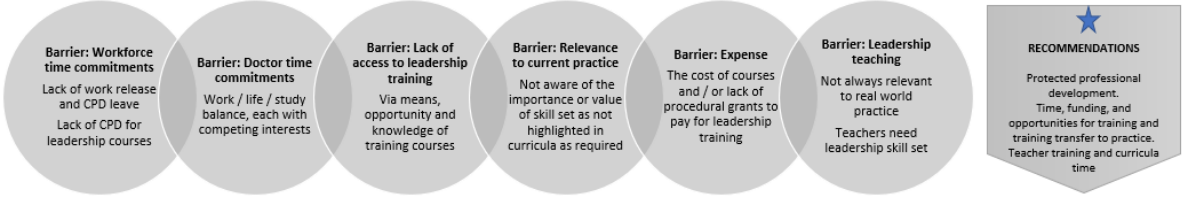
Both AMSA and QRGP reported similar barriers as JCU graduate doctors, that there is a lack of relevance, importance, or value of the leadership skills set to doctors, medical students, and teachers.

> “Perceived relevance. People don’t see the transferability, as well as skills.” (A,I-2)
>
> “In medical school and fellowship preparation, other content areas were often considered "more important" for passing exams, etc. so leadership training was not given priority.” (JD,M,S-177)
>
> “If people (teachers) themselves don’t understand the value or the concepts of medical leadership, then of course, they’re not going to teach it because they don’t appreciate what it is.” (Q,FG)
>
> “Lack of opportunities to put training into practice.” (ST,F,S-7)

Whereas AMSA and QRGP both discussed barriers of leadership curricula requirements such as content, teacher training, and difficulty to find time within the medical school curricula.

> The significant amount of content, and how difficult it is to teach leadership." (A,I-1)
>
> "From a faculty perspective, whether there is actually the leadership skill set within the faculty to be able to teach the content you might want delivered." Q(FG)
>
> "Time from a teaching perspective but also from a participant perspective." Q(FG)

**Figure 2: Key barriers for clinical leadership training**




*Informal Leadership Experiences - JCU Graduate Doctors and AMSA*

Outside of formal medical leadership training, 92 (49%) graduates responded to the open-ended question 'outside of medicine, what experiences or extra-curricular learning have you had to build or shape your leadership style or skills?'. All four AMSA participants also discussed extra-curricular leadership learning and experience within their interviews. Respondents often replied with multiple influences. After removing themes with less than three responses, this left nine themes (below) numbered from most to least common. See Additional File 1 for further information on each theme.

1. Team sport as a player or in a leadership role (33, 36%)
2. Extra-curricular school leadership experience in medical school or secondary education (22,24%)
3. Personal development of leadership skills (22, 24%)
4. Community organisations as an executive or member (22, 24%)
5. Volunteering (16, 17%)

6. Teaching experience in medical education, schools, and the community (14, 15%)
7. Parenting (7, 8%)
8. Paid employment whilst at secondary or medical school (7, 8%)
9. Church leadership (4, 4%)

Response comparisons between the JCU graduates and AMSA were mostly similar regarding their extra-curricular learning during their time as a medical student, except for AMSA participants' unique experience of volunteering for multiple AMSA roles while being a medical student.

*Informal Leadership Role Model Influences - JCU Graduate Doctors and AMSA*

Ninety (44%) JCU graduates responded to the free text question, 'Have you had any role models influence your leadership skills? If yes, how?'. All four AMSA participants discussed role models within their interviews. Respondents often replied with multiple influences and provided rich and insightful multifactorial elements of role model impacts and values.

Three overarching role model impact themes were identified. (More detailed information can be found in Additional File 2). The first theme, Impact of Role Models (123 responses) has six sub-themes of: knowledge received (38, 31%); emulation of positive role models (28, 23%); skills learned (22, 18 %); actual behaviour change (16, 13%); inspiration on how not to lead (13, 10%); and workplace culture change (6, 5%).

> "Watched good leaders be efficient with the plans they make - actually implement them and follow through. Also watched great leaders collaborate with all before making a plan - make everyone feel heard." (ST,M,S-156)
>
> "I attempt to emulate some of their practices/interpersonal skills in my everyday work." (GP,F, S-172)
>
> "Negative experiences informing my positive desire to be an agent for change." (SP,M,S-166)

The second theme, Role Model Mentoring Process and Values Taught (36 responses) has two sub-themes. The first is mentoring process (23, 64%), and second is values taught (13, 36%).

> "What leadership opportunities do you want to take on board in the next few years? What are your goals to get you there? So I had a few people constantly handing me this question, and I was forced to think about it." (A,I-2)
>
> "Taught me openness, kindness, to partner with patients to centre their healthcare." (SP,M,S-148)

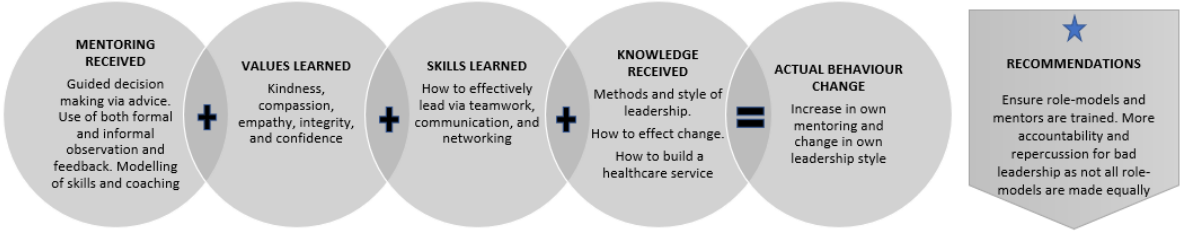
AMSA participants had more formalised experiences with their role models, particularly within their own AMSA role. Both AMSA and JCU graduate doctors had a clear understanding of the importance of the teamwork and communication skills they have learned and how these connect to leadership.

> "How to work optimally in a team, how to sort of support each other, how to recognize when other people are struggling and when they might need additional support, when to ask for help, when to like delegate things." (A,I-3)
>
> "Be proactive and nice to all members of team. Acknowledge people have limitations, working together maximises chances of success." (ST,F,S-126)

Of the third theme, Roles and Those Who Have Influence (24 responses), there were multiple role models including: nurses (12,13%); executives (12, 13%); senior clinicians (8, 33%); specialist (6, 25%); and family and corporate sector (4, 16%).

Figure 3 below, explains the type of mentoring received, values and skills learned, knowledge received, and own actual behaviour change as reported by participants above. Whereas the recommendations come from participant reported recommendations for change below.

**Figure 3: Impact of role models and mentors**



*Recommendations for change – JCU Graduate Doctors, AMSA, QRGP*

One hundred and twenty-seven (62%) graduates responded to the free text question, 'What changes would you like to see in medical leadership training across the continuum from medical school to senior doctor? What would you recommend?'. Additionally, all four AMSA participants discussed recommended changes to leadership training within their interviews, same as for QRGP executive within the focus group.

Respondents often replied with multiple recommendations and provided rich and insightful multifactorial proposed changes. Two overarching themes were identified. The first theme was 'leadership teaching recommendations' (166 responses). This theme has three sub-themes of: medical leadership training across the continuum (110, 66%); core leadership competencies to be taught (42, 25%); and assessment competencies (14, 9%). Within this theme, AMSA and QRGP proposed medical school leadership teaching recommendations, with graduates broadening this focus for medical school, junior doctors, senior doctors, specialists, and medical leadership across all teaching levels. More detailed information can be found in Additional File 4.

***For medical schools***

"Formal leadership training at medical school would be helpful as it continues throughout one's career as a doctor. It can be an introduction which would be appropriate at that level but can create and understanding of how your role on leadership will continue, change, and develop." (SP,F,S-45)

"More leadership roles in medical school and it being mandatory as part of medical school. When you are an intern, you are a leader for the medical students on the ward. When you are a reg, you are a leader for the medical students, interns, and residents. This is something that needs to be integrated into medical schools." (ST,M,S-141)

***For junior doctors***

"Appropriate intern leadership which allows PGY1 to understand they can lead at their junior level while understanding where their leaders might view them." (SP,M,S-166)

***For senior clinicians***

"I feel senior medical officers need this training more- the culture of medicine is changing and honestly the seniors are the ones who need more direction and support to appreciate this." (JD,M,S-2)

"Senior doctors need better training in team leadership as it is severely lacking." (GP,F,S-197)

***For specialists***

"Having leadership training as a part of supported training for new fellows. I believe there is already so much to learn and do when studying for fellowships, so leadership training should be part of (and heavily encouraged) in being a new fellow." (SP,F,S-90)

***Across all teaching levels***

"A more focused and graduated training package throughout the continuum with more recognition given to this often-neglected area of training." (SP,F,S-154)

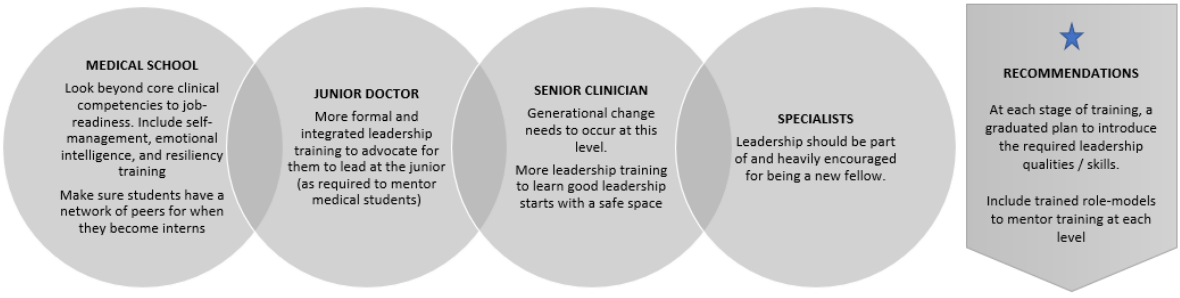
Further to the above, all three participant groups discussed core leadership competencies which should be taught (42,25% responses), with graduates and QRGP identifying appropriate assessment items such as OSCE stations and performance appraisals. The sub-themes include: teamwork (13,31%); leadership styles (11,26%); differences between leadership, management and education (9,21%), and leadership of self (9,21%).

The second theme is 'workforce recommendations' (29 responses), with two sub-themes identified as protected professional development (16, 55%) and culture change (13, 45%). These workforce recommendations have been added into figures 3 as discussed above.

AMSA and QRGP proposed medical school leadership teaching recommendations, with graduates broadening this focus for medical school, junior doctors, senior doctors, specialist and how to teach

medical leadership across all teaching levels. Figure four below explains these leadership teaching recommendations for medical leadership training across the continuum.

**Figure 4: Leadership teaching recommendations for medical leadership training across the continuum**




## Discussion

This is the first in-depth study into the factors and experiences of JCU medicine graduates, Australian medical student leaders, and medical leadership trainers regarding the state of medical leadership training across the medical continuum. As per the first published study in this series (phase one),[26] the findings are relevant to the Australian Medical Council and other accreditation bodies, agencies that teach leadership skills in clinical contexts, medical educators, clinical educators, academics, students, and the public. The findings will be discussed under the following headings:

- Experience in a Graduate Medical Leadership Role,
- Formal Graduate Leadership Teaching and Assessment,
- Informal Leadership Role Model Influences, and
- Recommendations for Medical Leadership Training.

### Experience in a Graduate Medical Leadership Role

Concerningly, a quarter of practicing specialists and almost half of general practitioners did not have experience in a leadership role, nor had almost half of the graduates in total. However, the more

opportunity graduates have for completing specialist studies, the more likely they are to have experience in a leadership role with two thirds of specialists experiencing a leadership role as a senior doctor. The findings also show a promising trend indicating current junior doctors and specialists in training appear to have more experience in a medical leadership role compared to when current senior doctors (general practitioner and specialists) were junior doctor. This trend is encouraging for future graduates having earlier leadership training and could indicate a growth of leadership opportunities for recent graduates.

***Formal Graduate Leadership Training and Assessment***

Almost half of the graduates stated they had formal leadership training, even if they may not experience leadership training until they are a senior doctor. As per table 5 and 6, there were some interesting findings about leadership training in medical school. The first was general practitioners had a strong trend to complete formal leadership training in medical school and had a significant trend of completing leadership training in medical school as part of extra-curricular training compared to junior doctors, specialist-in-training and specialists. The second was a significant trend that graduates who reported completing formal leadership training in medical school were working in a regional, remote, and rural setting compared to metropolitan. The third and final was graduates who had chosen to complete formal medical leadership at a specialist college, also had a strong trend to be working in a regional, remote or rural location. There are many possible explanations for the above. The most likely is the rural, remote, Indigenous, and tropical health focus of the JCU medicine course with extensive student placements in rural and remote areas (20+ weeks).[45] It is possible these graduates wanted to practise in a regional, rural, or remote towns, and/or had opportunity during their placements to work with positive role models and chose to emulate them by completing leadership training in preparation for their future rural careers. Further investigation would need to occur to confirm. The JCU medical students also have many extra-curricular leadership opportunities, such as tutoring, an elective subject, and to be an active member or executive of student clubs and societies.

More than a third of graduates have self-identified as having had formal leadership training outside of medical school. The teaching methods used to deliver this leadership training appear to be instructional such as seminars, lectures, workshops, with some transformative inquiry-based learning approaches of problem-solving and experiential learning. Also, for the graduates who reported formal leadership training, almost one-third advised they had no assessment of their formal medical leadership teaching. For the other two-thirds, the assessment of medical leadership training appears to be ad-hoc.

When it comes to formal leadership training opportunities there are multiple training pathways for general practitioners such as the Queensland Rural Generalist Pathway,[28] the Royal Australian College of General Practitioners,[43] and the Australian College of Rural and Remote Medicine (ACRRM).[46] However, for specialists, it is not clear which specialty colleges add leadership to their training program, or if leadership training is a priority to complete. As a minimum, specialty training pathways can vary between three and seven full-time study years.[47] The findings show (table 4) specialists are statistically more likely to complete formal leadership at a specialist college compared to all other practice categories; this is to be expected. However, the findings also show specialist graduates are significantly more likely to self-fund generic leadership training outside of the specialist college. Overall, the findings indicate that leadership training appears to be a large gap in the specialist training schedule for specialists in training, as well as for the CPD of specialists.

*Formal Leadership Barriers*

The findings show there are some large health system barriers for accessing medical leadership training. The themes in Figure 3 (Key barriers for clinical leadership training) show doctors in Australia have many commitments including work / life / study commitments. Many doctors did not know how to access medical leadership training, many also advised the cost of medical leadership training is expensive with no grants or scholarships available, and some advised they were not aware of the relevance or value of leadership as a skill set in medicine.

*Continuing professional development*

Alongside workforce time commitments, the findings demonstrated medical leadership CPD barriers. Some graduates identified a lack of work release for CPD leave, and lack of CPD points for medical leadership skills training. To remove the CPD work release barrier, a recommendation for CPD is protected professional development time for doctors to complete at least one set of CPD College or health service requirements per year. Although, it is understood this organisation change may not be possible with the current workforce shortage of doctors and specialist in regional, rural, and remote areas of Australia.[48,49] For specific medical leadership CPD training, some graduates recommend scholarships and grants to reduce the cost of leadership skills training. To add to this finding, the authors recommend (post-training) an opportunity for trainees to practice new leadership knowledge and skills in the workplace.

**Informal Leadership Role Model Influences**

Ninety percent of all graduate doctors self-identified role models influenced their leadership skills (table 3) but, only 13% described their own actual behaviour change, rather than the role models impactful behaviour (content analysis)). As per the content analysis for informal role-models, graduate doctors were inspired to make behaviour change based on the teaching and casual observations of mentors with almost a quarter reporting they wished to emulate the behaviours of these role models. In comparison, almost a sixth of graduate doctors in this study identified negative behavioural experiences they have observed and are consciously avoiding using the same behaviour.

**Recommendations for Medical Leadership Training**

*Medical leadership teacher training recommendations*

To ensure formal medical leadership training is relevant to real-world medical application, the authors recommend medical leadership teachers have leadership training and the training includes all transformational skills as discussed. If possible, it is recommended the curricula include real-world application for their student's geographical workforce requirements.

*Transformative leadership training for role models and mentors*

The themes in Figure 3: Impact of role models and mentors, shows a clear cause and effect that good role model processes may instil values, skills, knowledge and resultant positive behaviour change in others. Medical students and doctors are keen observers.[50,51] Formally, medical students and doctors observe a role model, mentor, and/or supervisor providing training of skills, values, and knowledge. The role model, mentor, and/or supervisor will then, in turn, observe and provide effective feedback to the medical student, doctor, or colleague on their skill performance. Whereas, informally, medical students and doctors observe mentors and role models having difficult conversations with patients, interactions with individual colleagues and their inter-professional team, plus discussions with administration and hospital executives. While at the same time, they observe the behaviours, attitude, performance, and quality of those they identify as a leader. As has been (previously) recommended in the literature,[52-54] medical students through to specialists require an identified and trained mentor or role model in clinical practice. The findings from this study suggests when role models (or mentors) teach values, skills, and knowledge, this impacts positively on teamwork and patient interaction. Due to this, the authors recommend transformation leadership training occur for any clinician (and/or other leader) in practice who has been identified as a role-model to medical students and/or clinicians junior to their own role. The leadership theory is extensive[1,5,14] but to summarise, the four characteristics of transformational leadership are inspirational leaders who:

1. Role model, show case, and display personal and professional goals with clear actions
2. Guide each staff and provide support and empathy based on individual staff necessity
3. Show case positive enthusiasm, optimism, and encouragement
4. Foster open and positive environments for the good of the organisation

The below examples of transformational leadership training are recommended based on this studies role model impact findings (see Figure 3). Transformational leadership training in a clinical setting may assist to strengthen leadership resulting in an increase of inter-professional teamwork, patient

interaction, and thus patient safety.[55] The authors suggest, overtime, this type of training may produce a pipeline effect, with peers and colleagues increasing their own mentoring and leadership skills to also be a doctor who has influence and instils positive behaviour change in others. Each of the below transformative leadership skills is referenced with a published article on how it can be used and/or taught in practice.

*Role model skills for use with others:*

- how to provide externally and internally guided decision making[56]
- formal and informal observation with effective feedback skills[57]
- effective modelling of skills[58]
- coaching to reduce burnout[59]

*Personal and professional values:*

- how to teach important values such as compassion,[60] empathy and integrity[61]

*Teamwork and network skills:*

- how to lead and improve an inter-professional team's effectiveness[62]
- inter-personal patient-clinician communication[63]
- networking to improve care[64]

*Health advocacy and service skills:*

- leadership focussing on quality care[65]
- how to effect change (health advocacy)[66]
- how to build a healthcare service.[67]

### *Medical leadership training across the continuum recommendations*

As summarised in Figure 4, the participants identified key recommendations to medical leadership training across the continuum. These are not extensive core curricula changes, instead they provide participant-identified medical leadership training needs for medical students and doctors.

#### *Medical students and junior doctor leadership training*

Participants recommendations for medical students included competencies of self-leadership, such as self-management, emotional intelligence, and resiliency. It does appear though, these are mostly being taught in Australian and New Zealand medical schools.[26,68] It was also recommended medical students understand they require a network of peers ready for internship. There are many ways to foster this is medical education, these include: discussing how their peers will be their colleagues in the future and the doctors they call on when requiring assistance (e.g. for patients, colleagues, or own health); curricula training for 'how to network'; collaborative small group work; encouragement of own weekly team study group; and introduction of senior students or medical graduate mentors while on placements.

Recommendations for junior doctors include an increase of formal compared to informal leadership training as they are required to mentor (lead) medical students as an intern. To assist with leadership empowerment for the junior doctors, the authors recommend advocacy both up and down the medical continuum for junior doctors to be awarded both expert and legitimate power[69] as leaders. These two types of power will aid both medical students and junior doctors to develop higher levels of organisational citizenship in the health service.[70]

#### *Senior clinician leadership training*

For senior clinicians, the findings strongly show this is where medical leadership training is needed most, with generational change required to understand, at a minimum, good leadership starts with a safe space to air personal, patient, and colleague needs, concerns, and complaints (see Figure 4). Within specialist training a small number of graduates recommended not to add medical leadership to the mix of extensive core specialty learning and instead heavily encouraged leadership training for

new fellows and part of CPD practice. Unfortunately, with the already discussed CPD workforce barriers, it might simply be easier to define core leadership training in the specialist training schedule.

**Limitations**

The survey was completed by medicine graduates of James Cook University in north Queensland, Australia. Although most of the graduate doctors were still training in Qld, these results provide a representative sample of doctors working across metropolitan (48%) to regional and very remote settings (52%). Interviews were held with AMSA executives who are undergraduate and graduates from other medical schools across Australia.

The participants in this study were graduate doctors, student leaders, and one specialist training program. It does not include data from current James Cook University medical students or the Royal Australian College of Medical Administrators (RACMA). Permission was sought to interview RACMA executive and teachers, but no agreement was formed, so not undertaken.

Due to committee turnover and logistic reasons, permission could not be secured from the 2020 AMSA participants to member check the results. However, a 2023 AMSA senior executive member volunteered to review this manuscript from the AMSA perspective and agreed with the written results.

The study does not evaluate a core medical leadership training program; however, data has been collected from graduate doctors, student leaders, and one specialist training program to identify the status of medical leadership roles, training, and recommendations. From the data, there are medical leadership training recommendations identified across the medical continuum from medical student to senior doctor.

**Conclusion**

Doctors are not being taught medical leadership training systematically across the Australian medical leadership continuum. Many doctors do not experience a formal medical leadership role or have formal medical leadership training. This study builds on the limited knowledge regarding medical leadership education within the medical education continuum in Australia. Based on the many years

of health system reforms recommending leadership training,[7-13,71] and due to the current shortage of general practitioners and specialists in regional and rural Australia[49] more information is required for doctors to understand the needs of leadership in the health system and community, with a quality and formal curriculum and assessment model that is affordable and practical. Integrated leadership training for role models across the medical continuum will ensure a formal systematic approach to the health and wellbeing of doctors, colleagues, and patients. Further, CPD enablers for medical leadership training include scholarships and grants and ensuring leadership training is relevant to real-world medical application of the participants geographical workforce requirements. These recommendations provide the opportunity to build systematic leadership and role model skills and knowledge in all doctors and provide teachers with a key set of skills to use.

**Declarations**

Ethics approval and consent to participate: Ethics approval was obtained through the James Cook University Human Ethics Committee (H6985 and H8411). All participants consented to complete the survey and for the data to be de-identified and published anonymously.

**Consent for publication:** Not applicable.

**Availability of data and materials:** All data generated or analysed during this study are included in this published article and its supplementary additional information files.

**Competing interests:** The authors declare that they have no competing interests.

**Funding:** No funding was received.

**Authors' Contributions:**

SR: Wrote the research protocol, developed the survey, analysed and interpreted the data, and drafted the manuscript. TSG: Supervised the research project, provided methodological support and provided manuscript editorial input. PJ: Supervised the research project, provided methodological support and provided manuscript editorial input. All authors have read and approved the manuscript.

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**Additional files :**

Additional File 1: Experiences of extra-curricula learning.pdf. Content analysis of the open-ended question ‘outside of medicine, what experiences or extra-curricula learning have you had to build or shape your leadership style or skills?’

Additional File 2: Potential barriers experienced or anticipated.pdf. Content analysis of the open-ended topic regarding ‘potential barriers experienced or anticipate experiencing regarding formal leadership training’.

Additional File 3: Role model influences of leadership skills.pdf. Content analysis of the open ended free-text question, ‘Have you had any role models influence your leadership skills? If yes, how?’

Additional File 4: Recommended changes to medical leadership training.pdf. Content analysis of free text question, ‘What changes would you like to see in medical leadership training across the continuum from medical school to senior doctor? What would you recommend?

Additional File 5: Medical Leadership Survey for Doctors

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## Appendix H.

## Twelve Tips Extra-Curricular Leadership Program


### Twelve tips for implementing an extra-curricular leadership program for medical student clubs and societies

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# Twelve tips for implementing an extra-curricular leadership program for medical student clubs and societies

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**Abstract**

Student clubs and societies have a large part to play with professional, social and advocacy activities on campus. As medical curricula are often overcrowded, leadership skills training is often not taught. Linking leadership skills training with the unique needs of societies via an extra-curricular leadership program for student society executives will impart leadership skills in how to make the most of their society role and to facilitate activities on campus.

In this article, the authors compiled twelve tips based on the relevant literature and their experience working in collaboration with student societies during the development of an ongoing extra-curricular leadership program. These tips will prepare academics and society executives to propose an extra-curricular leadership program and ensure the society executives experience leadership training tailored to their roles. This program can also translate to collaborative relationship between different societies, greater faculty-student collaboration, and improved student advocacy and professional skills

**Twelve tips for fostering an extra-curricular leadership program for medical student clubs and societies**

**Introduction**

Medical education has experienced an increased focus on leadership training for medical students, graduates, and health workers since the 1990's (Boelen 1993; Cook 1999; Boufford 1et al. 2002; Morales et al. 2008; Cooke et al. 2010; Frenk et al. 2010; General Medical Council. Outcomes for Graduates 2018). Separate leadership frameworks for clinicians have been developed in the UK (Black et al. 2010), Australia (Health LEADS Australia: the Australian health leadership framework 2013), and Canada (Spurgeon and Downs 2010; LEADS in a Caring Environment Framework 2014), over the past decade. While these frameworks outline the recommended requirements for medical leadership there is little

linkage to national strategies, or to learning outcomes and educational resources. A number of recent publications (Mountford and Webb 2009; Webb et al. 2014; Neeley et al. 2017; Till et al. 2017; Ross et al. 2018b) and a UK indicative undergraduate leadership framework (Medical leadership and management - an indicative undergraduate framework 2018) all argue that training in leadership skills should start in a medical professional entry degree/program (medical degree) to foster healthy workplaces and improve patient outcomes.

A common barrier reported in training leadership skills in a medical degree, is an already crowded curriculum (Jefferies et al. 2016; Ross et al. 2021). Medical education staff at the James Cook University College of Medicine and Dentistry (College) therefore developed an extra-curricular leadership program relevant to the health professional students at the College (medicine, dentistry, and pharmacy) who are in leadership positions. In particular, these students are executives of the various student clubs and societies (societies) (Ross et al. 2018a). This ongoing program is valued by both the societies and the College faculty as it has increased student and faculty collaboration and strengthened societies. These twelve tips emerged from a review of the literature; collaboration and partnership with society executives; and the authors' experiences in working with student leaders to develop the ongoing leadership program. The term College has been used in this paper to indicate a medical school with a medical entry degree/program. The tips address three phases: 1) society needs and faculty and staff buy-in, 2) curricula and presenter opportunities, and 3) technology and program evaluation.

## Society Needs and Faculty and Staff Buy-In

### Tip 1:

***Identify societies and their unique needs***

There are many different types of student societies. For example, some societies advocate for students and provide feedback to the faculty regarding their degree. Other societies may promote specific health disciplines such as rural or global health or support charitable causes and/or organise clinical skills nights. Identifying all societies can be challenging. One approach is to invite a society president or nominee to discuss other societies they are aware of and the name of key contacts, such as the society's president. In order to determine society leadership needs, meet with each society's contact to discuss their individual society needs and specific needs for intra- and inter-society leadership skills training (Bron et al. 2018). It is worth considering seeking the views of students who are members of multiple societies but not part of a society committee. These students will have seen the committees in action and may have a broader or more helicopter view of society challenges and successes.

**Tip 2:**

***Sign-up faculty/academic leaders***

Approach faculty/academic leaders to discuss the idea of a student society leadership program, along with the societies' needs. Suitable faculty may include those already holding a leadership role, already working with societies, those who are well regarded by students as an influential educational leader (Cruickshank 2017), or are willing to go above and beyond to mentor or advocate for students.

Explore with these faculty/academic leaders their interest in the leadership program and content they may be able to contribute. If possible, identify academics who can act as lead organisers for a component of the program collaboratively with students to provide student empowerment (Allin 2014) and the ability for real-world society leadership skills building. Faculty/Academic leaders can advocate or champion within the College for the program to start and to continue. They can also provide a wealth of ideas about how the program could be organised and are often willing to recommend presenters and attend themselves, as long as they are advised of the dates well in advance.

**Tip 3:**

***Write and submit your program proposal***

Gathering the above information on the societies' needs and having College leaders as champions will enhance the likelihood of a successful program. To finalise this program, present a written student society leadership program proposal to key decision makers e.g., the Dean or College Manager.

The proposal should be written jointly with academic and society representatives and all authors named. One way to write the proposal is to start with student society successes (for students and the College), then discuss their challenges and how a well-designed leadership skill building program could overcome the challenges and boost the successes. We recommend to discuss how it could promote positive student and faculty engagement, build on the College or university strategic goals, and how program outcomes could be useful for College and society promotional material.

Many medical degrees have a full curriculum, so it is important to define the leadership program as an extra-curricular program, external to the medical degree the students are enrolled in. Consider holding the leadership program on weeknights or weekends when 5society committees are not learning and are able to do society work. State the timeframe and duration of the program, whether it is for the current academic year only or ongoing for many years.

At a minimum, the proposal should include a recommended program with proposed content and example presenters. Also include how the program planning comprises joint academic and society representatives. It is important to add the name and contact details of academic leaders who have agreed to help and the expertise they bring to the program. If funding is requested, be clear on what it will be used for. For example, to take the students to dinner with guest presenters or to fund a leadership expert to present.

**Tip 4:**

***Collaborate with the society nominees or Presidents to determine the agenda and planning process***

Once your program has been approved, re-engage the society presidents, and meet with them at a suitable time to plan the first meeting and determine the agenda. Together, discuss the following issues:

- Timeline: Discuss their time commitments and propose a first leadership meeting at a time that is not crucial for student learning or their society, but is early enough in the academic calendar to be of benefit
- Location: Where the leadership meeting will be held and the booking process
- Content: Collectively review the challenges in the proposal and outline some leadership training. Discuss with representatives the types of leadership curricula they need for specific roles within the society. For example, finance training for treasurers
- Presenters: Collectively agree on who is to approach potential presenters, how and by when.

**Curricular and Presenter Opportunities**

**Tip 5:**

***Focus on collective society organisational culture challenges***

As previously discussed, articulation of each society's needs may highlight some collective organisational cultural challenges. Articulation and discussion of these challenges openly produces the ability for new society executives to talk about what cultural changes they would like to see and how they could implement them. For example, executive roles of societies are transient positions. Therefore, a challenge societies may see over time is lack of written documents and/or verbal hand-over, or re-written but not understood by-laws or position descriptions. This can produce a lack of executive participation through not being

able to understand their role. These challenges are not unique to student societies but occur commonly due to regular executive turnover.

To foster society culture to be in line with the College and university, it is important to keep societies abreast of the university goals and policies. Promoting university policies, values, and course curricula to societies, aids in explaining their legal and professional responsibilities within a society. Examples include:

- University and College values linked to building individual society values and goals
- The College curricula linked to the societies' (and College) student membership and their learning needs to help promote useful activities and clinical skills events
- Discussing university or College social media and/or bullying and discrimination policies, then connect them to society by-laws and collaboration with sponsors and members.

**Tip 6:**

***Focus on outcomes effective to inter-society needs (collaboration between societies)***

Depending on the number of student societies involved in the leadership program, there may be some inter-society learning needs and outcomes. Benefits of collaboration between societies include efficiency, mutual enrichment in goal progress, and shared responsibility and commitment to societies, members, and sponsors. Societies openly working together can set College and/or cohort standards and encourage other societies (Eich 2008).

As society members are often the student body of the College, it may be necessary for societies to build a more coordinated approach for sponsorships, programs, and events for maximum member engagement. One opportunity for inter-society collaboration is for the societies to hear and learn from each other as presenters of the leadership program (see tip 9 for a suggested process). Often societies work through similar though not identical goals, however, between societies there may be poor communication and siloed decision making of

these goals. Developing group work activities to assist societies to identify each other as collaborators instead of competitors, will provide the opportunity for society executives to discuss and learn from each other, including what works and what doesn't, and greatly helps the collegiality of societies within the College.

Another opportunity for inter-society collaboration is to ask the student executives to identify a collaborative leadership project to work on throughout the year. Examples of student society collaborative leadership projects include:

- Joint student society event timetable for members: Development of an electronic event calendar that one student executive from each society can update and student members from all societies can access
- Joint longitudinal planning for events and services: Societies collectively plan their events in advance to produce less calendar crowding and the ability for more members to attend
- Development of a shared electronic platform for resource sharing: Examples include Google Drive or Dropbox for societies to share templates and resources for executive roles
- Showcase of unique social media from societies: As video editing and production software becomes more diverse and user friendly, the creativity of societies executives to develop unique social media strategies also becomes more diverse. A showcase and sharing of this knowledge is recommended.

**Tip 7:**

***Focus on outcomes effective for specific intra-society needs***

Before designing this section of the leadership program, it is important to determine the experience of the executive. Some society executives will have extensive leadership learning and/or experience and may not feel this section is necessary as they will manage this in their first few meetings. Societies with less experienced executives will find this section very beneficial.

Examples of specific learning for intra-society needs include:

- Leadership Theories: Explore leadership theories and provide examples or case studies of leadership going well and leadership not going well, then discuss
- Clear understanding of the society's mission, members, and partners: As society executives are transient, it is important new executive understand the society's mission, members, and partners to align their activities
- Clearly defined individual and team goals and objectives: Each society executive discusses their goals and objectives to provide a collective overview of each role to the team. Then conduct a brainstorming session where each society reviews their collective team goals and objectives. For example, increase revenue, improve quality of services and/or marketing
- How to run an effective meeting: Effectively run meetings strengthens the team-leader and empowers the team. Present the key steps to effective team meetings, provide examples of effective agendas, and discuss how status reports makes the progress of individual executive roles visible to the team
- Cross-campus collaboration: For societies that have executives working on different campuses, it is necessary to ensure there is a process and effective channel of communication to achieve society goals. There also needs to be an understanding of decision making and where resource allocation fits across each campus.
- Conflict resolution: Conflict resolution is a specialty training and may require a visiting academic, but is essential training for a newly forming society
- Burnout: Collaboratively discuss the executive's workload and stress. For example, discuss responsibilities of executives beyond their society role, such as student study responsibilities and deadlines, paid employment, and family requirements etc.

**Tip 8:**

***Invest in leadership skills training to tailor to the society executive roles***

Most societies have standardised positions, such as President, Vice-President, Treasurer, Secretary, and officers responsible for sponsorship and communications. Providing training specific to the needs of these roles can be important. However, it is not always necessary to isolate each role and provide a separate presentation; often the learning is of value to many roles. With the society nominee or president, identify the roles that would value the learning at the time of writing the overall agenda. Below is an example of leadership skills training for the individual roles of President, Treasurer, Secretary, and Sponsorship Officer:

- Presidents: How to run an effective meeting, how to set an agenda and develop action plans, and why it is important to develop meeting ground rules with the executive
- Treasurers: The financial essentials for non-profit organisations in your country, how to keep track of cash and incoming and outgoing payments, and writing a treasurer's report
- Secretaries: The location of the societies' by-laws and why having in-depth knowledge of them is important, plus, how to write effective meeting minutes and when to circulate them
- Sponsorship and communications officers: How events management work, and the best practice for social media technology for societies.

**Tip 9:**

***Identify and make use of the expertise within the societies***

Students are an invaluable resource regarding their societies. They provide practical tips and tricks and can easily discuss what works and what does not. Their presentations to their peers are often as engaging and relevant as any staff or guest presenter. Topics could include:

- Handover process and templates
- Banking and money handling
- Event management checklists and reports

- Stakeholders and contact details for clinical skills events
- How to develop ongoing strategic plans.

Some influential student leaders may stay in the one society or move around the societies and explore different executive roles. Such students are often natural leaders, committed to developing leadership in themselves and others. Foster these students, encourage them to present to the societies and be willing to read their draft presentations and provide feedback. To ensure they feel valued, publicly thank them after they have presented.

To help each society feel they are involved, ensure each society has an opportunity to regularly present. If this is not possible, ask the executive from a non-presenting society to introduce a presenting executive.

**Tip 10:**

***Invite expert leaders to present***

Expert leaders as guest presenters can be from within the health system, a well-known local organisation, a visiting academic, or a local academic from a different discipline. Recommendations for presentations include:

- Share details of their journey from being a student to the leadership position they are in now
- Describe what they enjoy and do not enjoy about their current leadership position and why
- Describe their challenges and successes along their leadership journey
- Discuss burnout and how they balance home and work life.

Previous student society presidents and people who have a commitment to your university or College (alumni or staff) can be regular presenters. Below are some examples:

- University sponsorship officer: Present on how to arrange sponsorships

- Alumni or University staff: Present on strategic planning, society financial record keeping and legalities, or social media engagement
- Alumni or Dean of College: Present their leadership journey (from a student to now)
- Alumni of College and/or highly regarded health professional: Present teamwork in health.

Some student societies will be affiliated with a national organisation. For example, at our College, the James Cook University Medical Student Association (JCUMSA) is affiliated with the Australian Medical Student Association (AMSA). The society president may be able to arrange for a society executive within the national organisations to present. Such presentations by students in a national executive role, to students in a local executive role, provide excellent mentor value. They allow the local society executives to experience a fresh and relevant perspective for their society. This also allows them to consider where they would like to be in the future as mentors.

## Technology and Program Evaluation

### Tip 11

***Be flexible with the technology and delivery***

Post-COVID-19 learners are now used to digital learning with interactive, engaging, and innovative ways of presenting materials that are of high standard and have an appealing look and feel (Pokhrel and Chhetri 2021). Ways to keep up with modern digital learners include embedding videos, quizzes, and graphics into presentations. For example, online quiz software such as Kahoot or Mentimeter makes it easy for executives to answer questions via their mobile phone or another device. However, not all presentations are required to do this; a simple presentation with questions for society executives to reflect on their learning can be sufficient. As student society committees generally rotate yearly, presentations can be re-used and updated in future years.

Not all students need to be at the same location. With the now common use (post-COVID-19) of video-conferencing technology used in higher education, such as Zoom, Microsoft Teams, or WebEx, it is now easy and acceptable to video-conference society executives from other locations. This makes the opportunity fair for all executive, particularly those who may be attending a rural student placement or are located on a different campus. It is recommended to send out advice regarding video-conference etiquette in advance.

**Tip 12:**

***Evaluate the program and discuss feedback with the societies***

Effective evaluation of the program could use Kirkpatrick's (Kirkpatrick and Kirkpatrick 2006) four levels of evaluating training programs: evaluating of reactions, learning, behaviour, and results. In a leadership program where goal outcomes can produce culture change via both inter- and intra- society change, then the reaction stage can evaluate the societies executive's experience of and engagement in the program. The learning stage can evaluate the knowledge and skills achieved based on their leadership training. The behaviour stage can evaluate how the knowledge is put to use by the students in their society and in the student College culture. Whereas, the results stage can evaluate the impact the change has had on a student executive, the organisation, and/or student College culture.

As the behaviour and results stages require time for change to take place (Ulum 2015), a three-step methodology is recommended. Step one is to evaluate reaction and learning post-program via a survey. As mentioned earlier, student society roles are transient and it is likely different executive will attend the next leadership training, so step two is to email attendees a survey at the end of the teaching semester asking behaviour and results questions. At the next leadership training, step three is to identify the students who have attended at least one leadership training session and ask them to talk about what they learned and any change they have implemented themselves within their society or the College culture. The outcome of this

evaluation is three-fold. The first is for continuous quality improvement of the program, the second to prepare a report for senior faculty so they are aware of the outcomes, and the third is for use in accreditation documents.

**Conclusion**

An extra-curricular leadership program for student societies is novel but may be used as an active strategy to ensure the success of the current society executives. We present the above twelve tips to inform the incorporation of an extra-curricular student society's leadership program for the benefit of your College, societies and medical students. The twelve tips provided in this article are some techniques academics and student society executives can collaboratively use to create a leadership program. The benefits include greater collaboration between societies, within societies (including society organisational change), an increase of student member attendance at society events, a stronger collaboration between societies and the College, and most importantly leadership skills for society executives which transfer well to future health professional leadership skills and practices.

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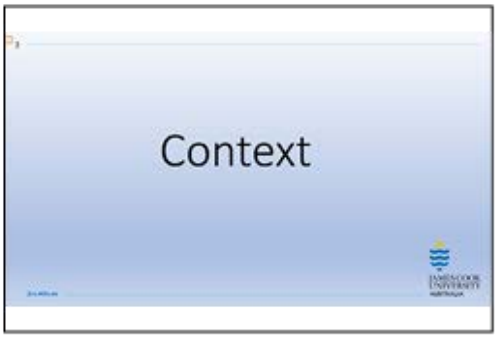
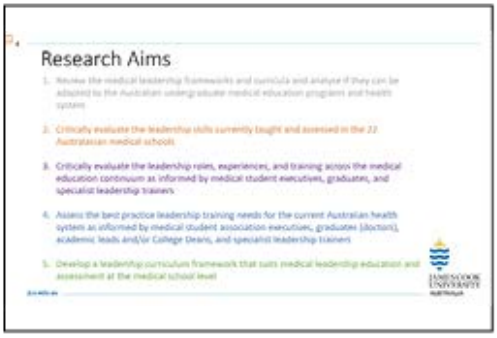
## Appendix I.

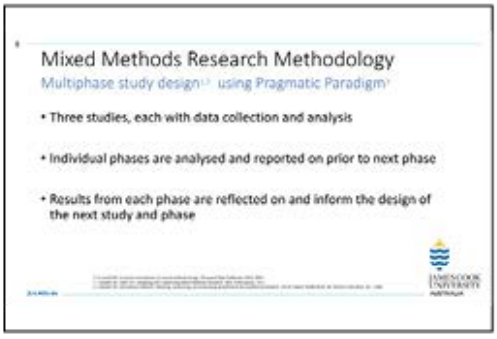
## ANZAHPE 2023 Development of Framework Presentation

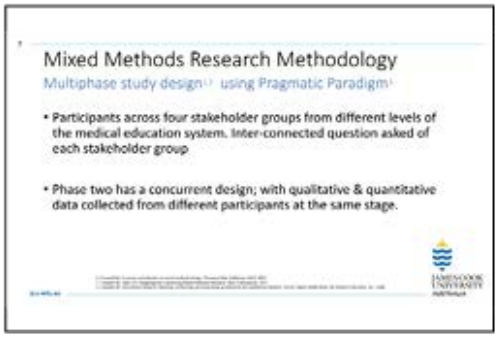



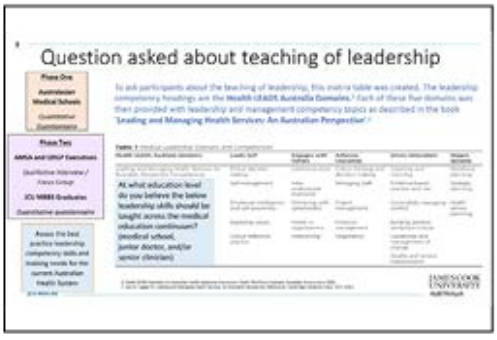


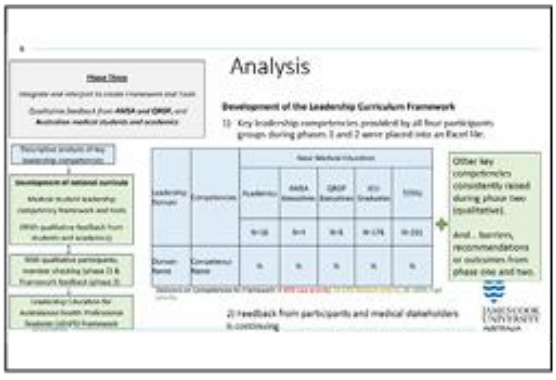







Analysis
Development of the Leadership Curriculum Framework
2) Feedback from participants and medical stakeholders is continuing

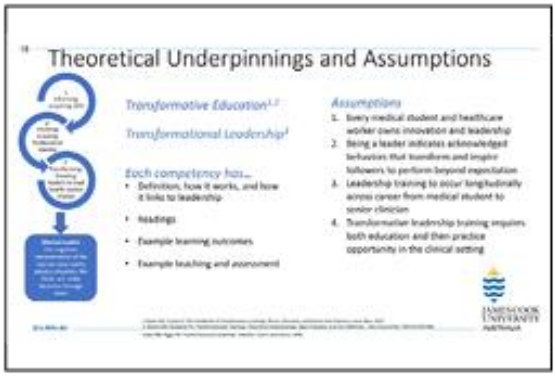

Findings & Recommendations

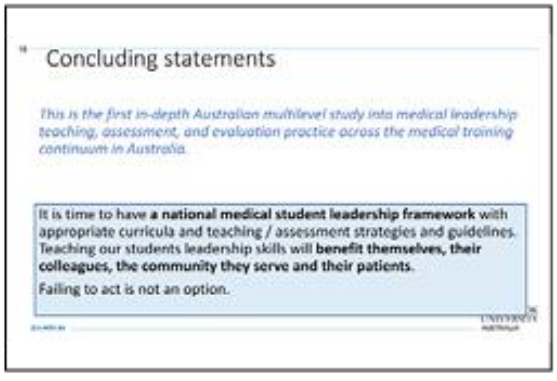

Framework Development Key Findings All Participants

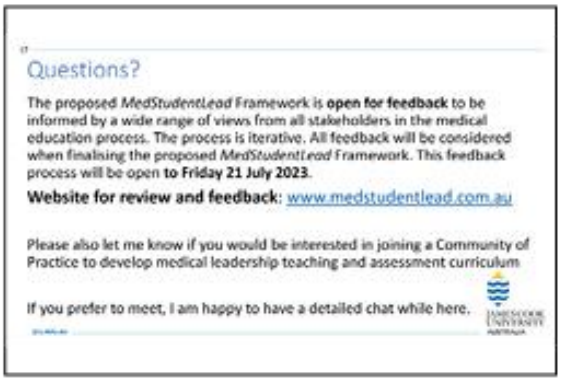

Medical Student Leadership Framework


Medical Student Leadership Framework

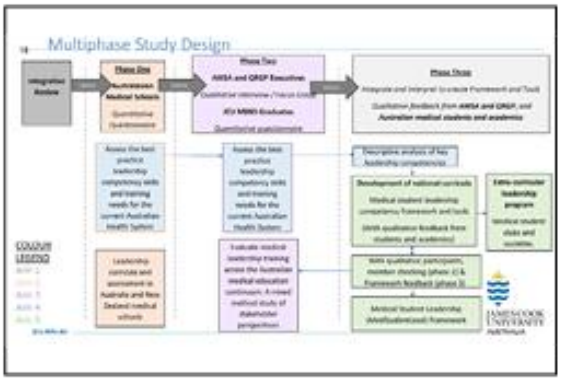

Medical Student Leadership Framework


Theoretical Underpinnings and Assumptions
Transformative Education
Transformational Leadership
Each competency has...
Definition, how it works, and how it links to leadership
Headings
Example learning outcomes
Example teaching and assessment
Assumptions
1. Every medical student and healthcare worker owns innovation and leadership
2. Being a leader indicates acknowledged behaviors that transform and inspire followers to perform beyond expectation
3. Leadership training to occur longitudinally across career from medical student to senior clinician
4. Transformative leadership training requires both education and then practice opportunity in the clinical setting


Concluding statements
This is the first in-depth Australian multilevel study into medical leadership teaching, assessment, and evaluation practice across the medical training continuum in Australia.
It is time to have a national medical student leadership framework with appropriate curricula and teaching / assessment strategies and guidelines. Teaching our students leadership skills will benefit themselves, their colleagues, the community they serve and their patients.
Failing to act is not an option.


Questions?
The proposed MedStudentLead Framework is open for feedback to be informed by a wide range of views from all stakeholders in the medical education process. The process is iterative. All feedback will be considered when finalising the proposed MedStudentLead Framework. This feedback process will be open to Friday 21 July 2023.
Website for review and feedback: www.medstudentlead.com.au
Please also let me know if you would be interested in joining a Community of Practice to develop medical leadership teaching and assessment curriculum
If you prefer to meet, I am happy to have a detailed chat while here.


Medical Student Leadership Framework


Multiphase Study Design