



**Continuing Professional Development  
of Allied Health Professionals: A Regional Study**

**Peter John Schenk**

DipAppSc Radiography; BMgt (Hons); GradDip Sonography; MBA

Submitted in total fulfilment of the requirements for the degree of  
**Doctor of Philosophy**

**Federation University Australia**

**Submitted July 2022**

**Federation Business School**

University Drive, Mount Helen

Ballarat Victoria 3353

Australia

This page is intentionally blank

# **Abstract**

## **Background**

The Australian healthcare system is challenged by an ageing population and lifestyle risk factors that disproportionately affect people in regional (non-metropolitan) geographic regions. In addition, the allied health professionals who work in knowledge-intensive occupations in regional Victoria face barriers regarding profession related learning. Allied health professionals provide diagnostic and therapeutic patient care services, and within these professions, healthcare diagnoses and treatments are expected by society and government to be founded on scientific evidence. Therefore, remaining up-to-date with rapidly developing knowledge requires continuing professional development (CPD).

## **Purpose**

This study explores pertinent issues affecting the CPD programs of allied health professionals and the interaction with regional Victorian public hospitals' knowledge management (KM) approaches. Consequently, the study identifies opportunities for improving profession related learning, enhancing evidence-based practice and the efficacy of diagnoses and treatments. The proposed outcome of this study addresses perceived inadequacies of allied health professionals' CPD and its contribution to medical errors. Furthermore, greater availability and effectiveness of profession related learning in these occupations should improve patients' health outcomes. The study described in this thesis answers the primary research question: 1) What factors significantly influence the availability and effectiveness of continuing professional development (CPD) for allied health professionals (radiographers, sonographers and physiotherapists)? In addition, it also answers the secondary research question: 2) How can the findings of this research be represented to improve the CPD of allied health professionals and knowledge management (KM) in regional Victorian public hospitals?

## **Methodology**

This study explores subjective phenomena involving human behaviour; therefore, the philosophical foundations of this study are post-positivist, with knowledge claims of interpretivist research. This research employs multi-site embedded case studies, defined as empirical enquiries investigating contemporary phenomena in real-world contexts.

Therefore, they are suitable for this investigation, where participant experiences and contexts are equally important. Case selection in this study expresses regionalism through remoteness classifications of inner and outer regional areas, and hospital size comparing small/medium and large/referral regional hospitals. The 37 respondents to semi-structured interviews include hospital managers and purposefully selected allied health professionals (radiographers, sonographers and physiotherapists). The interviews were conducted from March to June 2017, with thematic analysis completed thereafter.

## **Results**

Respondents in this study propose a holistic concept of CPD, encompassing all profession related learning opportunities, including learning from CPD activities and practice-based learning. Furthermore, the allied health professionals had various motivations for undertaking CPD, including maintaining and enhancing profession related knowledge, personal interest, supporting hospital needs, and meeting mandatory requirements. In addition, they discussed the factors that influenced their CPD planning, including their preference for formal face-to-face CPD activities, the availability of hospital-provided or local CPD activities, online learning, and overcoming barriers of their regional location. Finally, the factors influencing allied health professionals' CPD include their planning of CPD programs, the influence of hospitals' KM, and the competencies they consider necessary for good practice.

## **Conclusion**

The thematic analysis in this study represents this study's findings as a normative conceptual model in answer to the secondary research question. The Model of Allied Health Professionals' CPD (described in section 6.7) proffers a heuristic framework depicting reflective feedback and the process of deliberative planning of CPD. Extrapolating knowledge from the literature and respondents' experiences with CPD, the model's elements include interrelationships between allied health professionals' CPD planning and activities, hospitals' approaches to KM, and informal workplace learning. Furthermore, the combined outcomes of CPD and KM contribute to allied health professionals' competencies and expertise, presumably contributing to improving patients' healthcare, including diagnoses and treatments.

## Acknowledgements

Peter Schenk was supported by an Australian Government Research Training Program (RTP) Fee-Offset Scholarship through Federation University Australia. In addition, he was awarded a Federation Business School scholarship beginning in February 2015 and ending in September 2018.

I would like to express my sincere gratitude to my supervisory team, Dr Helen Weadon at Federation University Australia and Adjunct Professor Damian Morgan at James Cook University, Australia. These two people's insights, advice, and support have guided me to complete this study. In addition, many others have supported me on the long and winding road toward submitting this thesis. Before renewing my studies, Professor Ian Clark encouraged me to return to university and eventually join the PhD program. In addition, Assoc Prof Jerry Courvisanos and Dr Jacqueline Tuck supported me in the early years of the research project. I also want to thank Dr Rob Watson and Assoc Prof Jim Sillitoe for their part in providing reassurance and encouragement along the way.

I wish to express thanks to my family. Thank you to my wife, Judy, who has been a steadfast source of support and love throughout my life. In addition, supporting me through neurosurgery, two cancer diagnoses and the ongoing COVID-19 pandemic that have hindered my progress as a PhD candidate. I would also like to thank my children, Emily and Jonathan, who have inspired me to keep moving forward despite the many challenges of recent years. I also appreciate the love and encouragement from my wider family and friends, whose conversations over coffees have helped me complete this journey.

I am also extremely grateful to the hospital executives, managers and allied health professionals who have shared their time, knowledge and experiences as respondents in this study, making this research possible.

# Declaration

I hereby declare that this thesis is an original work and that I have not knowingly plagiarised the material or ideas of other authors. Where material or ideas from another author have been used, proper acknowledgement has been made using appropriate referencing for their publication. This work has not previously been presented to attain another degree at this university or for any purpose at another institution. This dissertation has a word limit of 100,000 words in length, excluding the abstract, tables, diagrams, references and appendices.

I acknowledge my responsibilities under the Copyright Act 1968.

I have obtained, where necessary, permission from the copyright owners to use any third-party copyright material reproduced in the thesis.

Signed:

Peter John Schenk

Date:

20 July 2022

# Table of Contents

<b>Abstract</b> .....	<b>iii</b>
<b>Acknowledgements</b> .....	<b>v</b>
<b>Declaration</b> .....	<b>vi</b>
<b>Table of Contents</b> .....	<b>vii</b>
<b>Table of Figures</b> .....	<b>xiii</b>
<b>List of Tables</b> .....	<b>xiv</b>
<b>Table of Appendices</b> .....	<b>xv</b>
<b>Statement of Ethics Approval</b> .....	<b>xvi</b>
<b>List of Acronyms</b> .....	<b>xvii</b>
<b>Glossary</b> .....	<b>xix</b>
<b>1 Introduction</b> .....	<b>1</b>
1.1 Research Questions .....	3
1.1.1 Subsidiary research questions .....	3
1.2 Significance of the Study .....	4
1.3 Research Methodology.....	4
1.4 Project Design .....	4
1.5 Data Analysis .....	5
1.6 Outcomes.....	6
1.7 Thesis Structure.....	7
<b>2 Literature Review</b> .....	<b>8</b>
2.1 The Sociology of Professions.....	9
2.1.1 Characteristics of professions .....	10
2.1.2 Professionalism .....	11
2.1.3 Professions and modern organisational forms .....	12
2.1.4 Allied health professions.....	13
2.1.5 Professionalisation .....	14
2.1.6 The professionalisation of allied health professions .....	15
2.2 Knowledge Management.....	17
2.2.1 The nature of knowledge .....	17
2.2.2 Social Capital Theory .....	19
2.2.3 Knowledge management models .....	20
2.3 Adult Education.....	29

2.3.1	Adult learning – andragogy .....	29
2.3.2	Typology of adult learning.....	30
2.3.3	Social learning .....	30
2.4	Continuing Professional Development (CPD).....	34
2.4.1	Learning-action theories .....	38
2.4.2	Lifelong learning.....	38
2.4.3	Self-directed learning.....	40
2.4.4	Reflective practice .....	41
2.4.5	Models of continuing education and CPD.....	45
2.4.6	CPD activities in allied health.....	46
2.4.7	Communities of practice .....	48
2.4.8	Professional expertise .....	51
2.4.9	Professional competency frameworks .....	56
2.4.10	CPD planning.....	60
2.4.11	Effectiveness of CPD.....	63
2.5	Conclusion.....	67
<b>3</b>	<b>Research Context .....</b>	<b>69</b>
3.1	Australian Healthcare System .....	69
3.2	Regional Healthcare .....	71
3.3	Victorian Public Hospitals .....	73
3.4	Hospitals Participating in this Research.....	74
3.4.1	Case hospital A .....	74
3.4.2	Case hospital B .....	74
3.4.3	Case hospital C .....	75
3.4.4	Case hospital D .....	75
3.4.5	Case hospital E.....	75
3.5	Allied Health Professions in Australia.....	76
3.5.1	Radiography.....	76
3.5.2	Sonography .....	78
3.5.3	Physiotherapy.....	80
3.6	Conclusion.....	82
<b>4</b>	<b>Research Methodology .....</b>	<b>85</b>
4.1	Philosophical Assumptions .....	85



4.1.1	Epistemology – constructionism.....	86
4.1.2	Ontology – relativism .....	86
4.1.3	Interpretivist paradigm.....	87
4.1.4	Hermeneutic phenomenology .....	87
4.2	Embedded Case Studies .....	89
4.2.1	Unit of analysis .....	90
4.2.2	Multi-site case study .....	91
4.2.3	Case selection.....	94
4.3	Methods.....	97
4.3.1	Ethics approval (June 2016 – February 2017) .....	98
4.3.2	Participant recruitment (November 2016 – March 2017).....	99
4.3.3	Questionnaires (February 2017 – March 2017).....	100
4.3.4	Semi-structured interviews (March 2017- June 2017).....	100
4.4	Research Analysis .....	105
4.4.1	Familiarisation .....	106
4.4.2	Indexing .....	107
4.4.3	Charting.....	107
4.4.4	Synthesising the data.....	108
4.5	Conclusion.....	108
<b>5</b>	<b>Thematic Analysis (Findings) .....</b>	<b>111</b>
5.1	Overall Conception of CPD .....	112
5.2	Motivations for CPD .....	114
5.2.1	Mandatory CPD required for professional registration .....	114
5.2.2	Patient care.....	115
5.2.3	Maintenance and enhancement of knowledge and skills.....	117
5.2.4	Evidence-based practice.....	118
5.2.5	Professional advancement.....	120
5.2.6	Personal interest .....	122
5.2.7	Hospital needs.....	123
5.2.8	Regional location demotivating .....	124
5.3	Responsibility for CPD .....	124
5.3.1	Allied health professionals are primarily responsible for CPD .....	124
5.3.2	Hospitals share responsibility for CPD.....	125

5.3.3	Professional associations' role .....	125
5.4	CPD Activities.....	127
5.5	Competencies considered necessary for good practice.....	127
5.5.1	Patient care.....	128
5.5.2	Knowledge for practice.....	129
5.5.3	Interpersonal and communication skills .....	131
5.5.4	Professionalism.....	131
5.5.5	Inter-professional collaboration.....	133
5.6	Hospital Knowledge Management and CPD .....	134
5.6.1	An organisational approach to KM.....	135
5.6.2	The constraining influence of medicine.....	137
5.6.3	Personal approaches to KM .....	139
5.6.4	How best-practice knowledge is shared.....	140
5.7	Planning of CPD Programs .....	142
5.7.1	Hospital accreditation .....	143
5.7.2	Hospital provided CPD .....	144
5.7.3	Hospital support for CPD.....	145
5.7.4	Effect on recruitment and retention .....	146
5.7.5	Reflective practice .....	147
5.7.6	Relying on reactive reflection.....	148
5.7.7	Few examples of long-term strategic planning.....	149
5.7.8	Local availability .....	151
5.7.9	Online learning.....	152
5.7.10	Formal and informal mix .....	153
5.7.11	Interdisciplinary CPD .....	154
5.8	Informal learning in regional hospitals .....	155
5.8.1	Generalist practitioners in small/medium-sized hospitals .....	156
5.8.2	Informal learning: Collaboration with experts.....	157
5.8.3	Informal learning: Challenging practice .....	161
<b>6</b>	<b>Discussion.....</b>	<b>165</b>
6.1	Overall Conception of CPD .....	165
6.2	Motivations for CPD .....	167
6.2.1	Mandatory CPD for professional registration.....	168

6.2.2	Patient care.....	169
6.2.3	Maintenance and enhancement of knowledge and skills.....	170
6.2.4	Evidence-based practice.....	170
6.2.5	Professional advancement.....	171
6.2.6	Personal interest.....	172
6.2.7	Hospital needs.....	173
6.2.8	Regional location can be demotivating.....	174
6.3	Responsibility for CPD.....	175
6.3.1	Allied health professionals primarily responsible for CPD.....	175
6.3.2	Hospitals share responsibility for CPD.....	176
6.3.3	Professional associations' role.....	176
6.4	Competencies considered necessary for good practice.....	177
6.4.1	Patient care.....	178
6.4.2	Knowledge for practice.....	179
6.4.3	Interpersonal and communication skills.....	179
6.4.4	Professionalism.....	181
6.4.5	Inter-professional collaboration.....	182
6.5	Hospital Knowledge Management and CPD.....	183
6.5.1	An organisational approach to knowledge management.....	184
6.5.2	The constraining influence of medicine.....	185
6.5.3	Personal approaches to knowledge management.....	185
6.5.4	How best-practice knowledge is shared.....	187
6.6	Planning of CPD Programs.....	188
6.6.1	Hospital accreditation.....	188
6.6.2	Hospital-provided CPD.....	189
6.6.3	Hospital support for CPD.....	190
6.6.4	Reflective Practice.....	190
6.6.5	Few examples of long-term strategic planning.....	192
6.6.6	Local availability.....	193
6.6.7	Online learning.....	194
6.6.8	Formal and informal mix.....	195
6.6.9	Interdisciplinary CPD.....	197
6.7	Model of Allied Health Professionals' CPD.....	198

6.7.1	Extra-organisational context .....	199
6.7.2	Organisational context .....	199
6.7.3	Knowledge management.....	201
6.7.4	Informal workplace learning.....	201
6.7.5	CPD planning.....	202
6.7.6	CPD activities .....	203
6.7.7	Professional competencies .....	203
6.7.8	Professional expertise and healthcare practice .....	204
6.7.9	Healthcare outcomes .....	204
<b>7</b>	<b>Conclusion .....</b>	<b>206</b>
7.1	Critical Parameters Influencing CPD Programs.....	206
7.1.1	Regional location .....	207
7.1.2	Hospital size.....	208
7.1.3	Professions included in the study.....	208
7.1.4	Professional expertise .....	209
7.2	Summary of the research findings.....	210
7.2.1	CPD – holistic understanding .....	212
7.2.2	Planning of CPD Programs.....	213
7.2.3	Knowledge management.....	214
7.2.4	Professional expertise .....	216
7.2.5	Competencies necessary for good practice .....	217
7.2.6	Model of allied health professionals’ CPD.....	220
7.3	Significance of the Findings.....	224
7.4	Contributions of this Research to Practice .....	226
7.5	Limitations of the Research and Methodology .....	228
7.6	Further Research .....	229
	<b>References.....</b>	<b>231</b>
	<b>Appendices.....</b>	<b>252</b>

# Table of Figures

Figure 1 <i>Foundation Literatures of CPD – Overlapping Sets</i> .....	8
Figure 2 <i>W.R. King - Knowledge Management Process Model</i> .....	21
Figure 3 <i>Knowledge Management Model</i> .....	23
Figure 4 <i>SECI Model of Knowledge Creation</i> .....	25
Figure 5 <i>Conceptual Framework of CPD in Allied Health</i> .....	35
Figure 6 <i>Stages of Skill Acquisition versus Continuum of Skill Acquisition</i> .....	55
Figure 7 <i>Expenditure on Australian Public Hospitals</i> .....	70
Figure 8 <i>Number of Victorian public acute care hospitals by size</i> .....	73
Figure 9 <i>Research Strategy</i> .....	88
Figure 10 <i>Embedded Case Study Design</i> .....	91
Figure 11 <i>Multi-Site Embedded Case Studies</i> .....	92
Figure 12 <i>Theoretical Non-Probability Sampling</i> .....	94
Figure 13 <i>Victoria Remoteness Structure</i> .....	95
Figure 14 <i>Data Collection Methods</i> .....	98
Figure 15 <i>Model of Allied Health Professionals’ CPD</i> .....	200
Figure 15 <i>Model of Allied Health Professionals’ CPD</i> .....	221

# List of Tables

<b>Table 1 Australian Allied Health Professionals .....</b>	<b>14</b>
<b>Table 2 Mandatory CPD for Registration in Australia.....</b>	<b>36</b>
<b>Table 3 Key characteristics of a community of practice .....</b>	<b>49</b>
<b>Table 4 Stages of Skill Acquisition .....</b>	<b>52</b>
<b>Table 5 Taxonomy of Competency Domains for Healthcare Professions .....</b>	<b>58</b>
<b>Table 6 Models of Effective Continuing Education (CE) and Training.....</b>	<b>65</b>
<b>Table 7 Participating case hospital categories .....</b>	<b>96</b>
<b>Table 8 Hospital managers' interviews .....</b>	<b>102</b>
<b>Table 9 Allied Health Professionals' Interviews .....</b>	<b>103</b>
<b>Table 10 CPD activities undertaken by respondents in the previous 12 months .....</b>	<b>127</b>
<b>Table 11 Thematic Analysis.....</b>	<b>210</b>

# Table of Appendices

Appendix A <i>Participant Information / Hospital Managers</i> .....	252
Appendix B <i>Participant Information / Allied Health Professionals</i> .....	255
Appendix C <i>Consent Form</i> .....	258
Appendix D <i>Taxonomy of Competency Domains for Healthcare Professions</i> .....	259
Appendix E <i>Victorian Regional Acute Public Hospitals (2011-2012 Peer Groups)</i> .....	262
Appendix F <i>ASAR Accredited Qualifications</i> .....	264
Appendix G <i>ASAR CPD Activities, Credit &amp; Documentation</i> .....	266
Appendix H <i>Interview Invitation email / Managers</i> .....	268
Appendix I <i>Invitation Presentation Script / Allied Health</i> .....	269
Appendix J <i>Questionnaire Invitation / Allied Health</i> .....	270
Appendix K <i>Interview Schedule / Hospital Manager</i> .....	271
Appendix L <i>Interview Schedule / Allied Health Manager</i> .....	272
Appendix M <i>Interview Schedule / Allied Health Professional</i> .....	273
Appendix N <i>Research Governance Approvals Letter</i> .....	274
Appendix O <i>Framework of Analysis / Manager Questions</i> .....	276
Appendix P <i>Framework of Analysis / Allied Health Manager Questions</i> .....	278
Appendix Q <i>Framework of Analysis / Allied Health Professionals Questions</i> .....	280

# Statement of Ethics Approval

The research presented in this thesis has complied with the ethics requirements and procedures of Federation University Australia, Human Research Ethics Committee (HREC) guidelines. In addition, the Federation University guidelines are in accordance with the National Health and Medical Research Council (NHMRC) guidelines for conducting research with human participants, including personal interviews.

The purpose and objectives of this research were described in the Participant Information plain language information statement (PLIS) provided to each participant and discussed with them prior to interviews commencing (Appendices A & B).

Participation by the individuals interviewed in this research was voluntary and only proceeded after acceptance of an invitation. The participants were advised that it might not be possible to guarantee total anonymity because of the study's small sample size. Each participant was provided with a consent form (Appendix C) before the interview, with any questions answered by the interviewer. The participants signed and dated the consent form prior to their interview commencing.

This research was conducted in Victorian public hospitals and therefore required approval by a Victorian government-appointed committee and the university ethics committee:

1. Austin Health Human Research Ethics Committee

Reference Number: HREC/16/Austin/483

Approval date: 23 January 2017

2. Federation University Australia, Human Research Ethics Committee

Project Number: E17-001

Approval date: 6 February 2017



## List of Acronyms

ABMS	American Board of Medical Specialties
ABS	Australian Bureau of Statistics
ACGME	Accreditation Council for Graduate Medical Education
AHPA	Allied Health Professions Australia
AHPRA	Australian Health Practitioner Regulation Agency
AHSSQA	Australian Health Service Safety and Quality Accreditation Scheme
AIHW	Australian Institute of Health and Welfare
AIR	Australian Institute of Radiography
ASA	Australian Sonographers Association
ASAR	Australian Sonographer Accreditation Registry
ASGS	Australian Statistical Geography Standard
ASMIRT	Australian Society of Medical Imaging and Radiation Therapy
ASUM	Australasian Society for Ultrasound in Medicine
ASUMB	Australian Society for Ultrasound in Medicine and Biology
CAL	Commonwealth Acoustic Laboratories
CAQDAS	Qualitative Data Analysis Software
CE	Continuing Education
CEO	Chief Executive Officer
CoP	Community of Practice
CPD	Continuing Professional Development
CT	Computed Tomography
DDU	Diploma of Diagnostic Ultrasound
DHHS	Department of Health & Human Services
DoH	Department of Health
DSA	Digital Subtraction Angiography
EPA	Entrustable Professional Activity
FTE	Full-Time Equivalent

ICT	Information and Computer Technology
KM	Knowledge Management
KTA	Knowledge-to-Action
M&M	Mortality and Morbidity
MRI	Magnetic Resonance Imaging
MRPBA	Medical Radiation Practice Board of Australia
OECD	Organisation for Economic Co-operation and Development
PAEB	Professional Accreditation and Education Board
PBA	Physiotherapy Board of Australia
PBS	Pharmaceutical Benefits Scheme
PDP	Professional Development Portfolio
PLIS	Plain Language Information Statement
RACR	Royal Australasian College of Radiologists
RMIT	Royal Melbourne Institute of Technology
RWAV	Rural Workforce Agency Victoria
SARRAH	Services for Australian Rural and Remote Allied Health
SC	Social Capital
SCT	Social Cognitive Theory
SECI	Socialisation, Externalisation, Combination and Internalisation
SONAR	Sound Navigation Ranging
TAFE	Technical and Further Education
UK	United Kingdom
VET	Vocational Education and Training
WCPT	World Confederation of Physical Therapy
WIP	Workforce Incentive Program

# Glossary

<b>Affordances:</b>	Workplace opportunities for participation in learning experiences of CPD provided by employers (Billett, 2001).
<b>Analytical:</b>	Examining things in detail, in order to discover more about them (Cambridge University, 2022).
<b>Andragogy</b>	Adult learning concept where adult education programs align with adult needs, being learner-centred and life-driven (Bierema, 2019).
<b>Codify:</b>	Arrange (laws or rules) into a systematic code (Oxford University, 2022).
<b>Community of Practice:</b>	A group of people who share a passion for something they do, learning how to do it better by interacting regularly (Wenger-Trayner & Wenger-Trayner, 2015).
<b>Competency:</b>	<ul style="list-style-type: none"><li>• Ability to complete task effectively or efficiently (Oxford University, 2022); or</li><li>• Categories of knowledge, discrete practical clinical skill-sets, and socially normative attributes to meet a profession's overall goals (Englander et al., 2013; Stefanovski, 2020).</li></ul>
<b>Constructionism:</b>	Considers reality and knowledge as socially constructed, relying on a person's point of view and individual experiences (Creswell & Poth, 2017; Peck & Mummery, 2018).
<b>Context:</b>	The situation within which something exists or happens and that can help explain it (Cambridge University, 2022).
<b>Epistemology:</b>	The theory of knowledge and justified belief; analysing notions of truth and scepticism about knowledge claims and the diversity of conceptions of knowledge (Audi, 2011; Bagnall & Hodge, 2017).
<b>Existentialism:</b>	A philosophy of human existence that emphasises a holistic view of the human condition, correlating personal perspectives and circumstances to historical and social contexts (DeRobertis, 2017; Rumianowska, 2020).
<b>Expertise:</b>	Expert skill or knowledge in a particular field (Oxford University, 2022).
<b>Explicit:</b>	Stated clearly in detail leaving no room for confusion i.e. tangible information such as codified documents and protocol manuals (Hadjimichael & Tsoukas, 2019; van Beveren, 2002).
<b>Framework:</b>	Basic structure underlying a system (Oxford University, 2022).
<b>Healthcare:</b>	The activity or business of providing medical services (Cambridge University, 2022).
<b>Hermeneutics:</b>	Systematic holistic interpretation considering speech and text as data, searching for explicit and hidden meaning considering the distinctive time, place and context in which it appears (Bleicher, 2017; Farin, 2016; Mantzavinos, 2016; Romer, 2016).
<b>Holistic:</b>	Characterised by treating the whole person, taking all factors into account, rather than only symptoms of illness (Oxford University, 2022).
<b>Idiosyncratic:</b>	Having unusual habits or individual ways of behaving (Cambridge University, 2022).

<b>Interrelationships:</b>	The way in which two or more things or people are connected and affect one another (Cambridge University, 2022).
<b>Knowledge management:</b>	The exploitation and development of knowledge in an organisation to meet management objectives (Rowley, 1999).
<b>Metaphor:</b>	a thing regarded as representative or symbolic of something else (Oxford University, 2022).
<b>Motivation:</b>	Desire or willingness to do something; enthusiasm (Oxford University, 2022).
<b>Ontology:</b>	System of belief concerned with social reality. Subjective perspectives view interactions of people within social and temporal contexts (Creswell & Poth, 2017; O’Gorman & MacIntosh, 2015).
<b>Pervasive:</b>	Present or noticeable in every part of a thing or place (Cambridge University, 2022).
<b>Phenomenology:</b>	Purist phenomenology focused on meanings of phenomena with no disregard for the context in which they occurred, enabled by a person’s detailed recall regarding the subject of enquiry (Flood, 2010; Husserl, 1981; J. Smith et al., 2009).
<b>Profession:</b>	Sociological construct applied to occupations that have specialised, well-trained members serving the public interest, high-quality work, a shared ethical code and a strong commitment to CPD (Freidson, 2001; Pekkola et al., 2018; Popkewitz, 1994).
<b>Professionalisation:</b>	Process of giving an occupation or group professional qualities, typically by increasing training or raising required qualifications (Oxford University, 2022).
<b>Professionalism</b>	The concept of professionalism is defined by occupations meeting societal expectations that professionals are knowledgeable, skilful, trustworthy, and exhibit exemplary behaviours (Burns, 2019a; Pekkola et al., 2018).
<b>Reflection:</b>	Serious thought or consideration (Oxford University, 2022).
<b>Relativism:</b>	Theories of knowledge and truth judging that subjective personal knowledge and understanding varies between individuals, with each person experiencing their place and time differently; with reality compared to others (Creswell & Poth, 2017; O’Gorman & MacIntosh, 2015).
<b>Social contract:</b>	Implied agreement among the societies’ members cooperating for social benefits (Oxford University, 2022).
<b>Socialisation:</b>	Process of learning to behave in a way that is acceptable to society (Oxford University, 2022).
<b>Sociological construct:</b>	An idea or theory containing various conceptual elements, typically subjective and not based on empirical evidence, concerning the structure and functioning of society (Oxford University, 2022).
<b>Tacit:</b>	Understood or implied without being stated i.e. intangible, taking place independently of consciousness and operating outside of awareness (Hadjimichael & Tsoukas, 2019; Oxford University, 2022; Reber, 1989).

# 1 Introduction

The consensus among the Australian government, academics and healthcare practitioners is that ongoing education will improve the effectiveness and efficiency of practice, resulting in more evidence-based practice. Recognising that well-educated healthcare professionals are integral to effective healthcare services, the availability of professional education has grown dramatically. However, the preference of allied health professionals to participate in formal face-to-face educational activities is frustrated by the limited availability of learning opportunities in regional locations (Rappolt & Tassone, 2002; Stagnitti et al., 2005). As a result, regional healthcare organisations face the combined challenges of addressing the health disadvantages experienced by regional populations (Department of Health, 2012) and managing the continuing education of the healthcare professionals they employ. For healthcare managers to succeed on both fronts, they must understand the mechanisms of healthcare professionals' ongoing learning.

Efforts to maintain currency with rapidly developing knowledge in healthcare requires continuing professional development (CPD), which is the “maintenance and enhancement of knowledge, expertise and competence of professionals throughout their careers” (Madden & Mitchell, 1993, p. 3). The Australian government holds healthcare professionals accountable, requiring mandatory CPD for professional registration. However, although mandatory, the choice of learning activities in their CPD is mainly at the discretion of individual healthcare professionals.

The motivations attributed to allied health professionals regarding their CPD are complex and combine multiple factors (Murphy & Calway, 2007; Stagnitti et al., 2005). However, it is not sufficient that healthcare professionals merely select and undertake CPD activities, but rather that they should implement a planned strategy, including formal and informal activities (Dowds & French, 2008). However, previous research indicates that some allied health professionals have neglected strategy and planning concerning CPD (Henwood & Huggett, 1999; Karas et al., 2020; Phillips, 2011; Schenk, 2014). Furthermore, informal work activities' contribution to professional skill acquisition can be between 70-90 per cent of professional learning; however, this contribution is under-appreciated by government regulators and practitioners (Eraut, 2011). The skills required for competent practice in professions develop incrementally from novice to expert skill levels (Dreyfus et al., 1986). Therefore, models of skill acquisition are suitable tools for

researching the complex practice of allied health professions and have been utilised in the research study detailed in this thesis.

Many of the goals and processes of allied health professionals' CPD also complement hospitals' knowledge management (KM) efforts to control and exploit knowledge (Rowley, 1999). KM collectively includes management processes that enable the exploitation of knowledge for an organisation's benefit to assist in meeting objectives. The primary purpose of KM in hospital settings is to identify, develop and diffuse knowledge for the purpose of increasing the use of evidence based practice. In relation to this study, hospital managers' responsibilities include facilitating knowledge-seeking and sharing among allied health professionals. The interrelationship between the CPD of allied health professionals and the KM of healthcare organisations cannot be ignored if strategic planning for ongoing education is to be effective. At different stages in allied health professionals' careers, they will have differing personal learning preferences and professional learning needs. Furthermore, the knowledge managed by KM processes includes tangible 'explicit' knowledge and intangible 'tacit' knowledge (Nonaka, 1994). These explicit and tacit classifications of knowledge correlate well with skill acquisition models, with relative contributions of explicit and tacit knowledge changing along a continuum of expertise; novices learn more from explicit rules, and experts learn more from tacit sources (Benner, 2004; Dreyfus et al., 1986). In addition, typical approaches to KM emphasise an organisational approach relying on explicit knowledge or a personal approach relying on tacit knowledge. However, many organisations use KM approaches with hybridised combinations of these two knowledge classifications (Brown & Duguid, 1991; Szulanski, 1996; van Beveren, 2002; Yang, 2007). Regardless of the approaches adopted, organisations should aim to motivate employees to participate in knowledge-seeking and knowledge-sharing behaviours.

This research takes an approach to CPD and KM, which is concerned with the professional knowledge and skills that are critical to allied health practice (Chatti, 2012; Kothari et al., 2011; Orzano et al., 2008). However, many of the conceptual models of KM are based on research conducted in large organisations, requiring resources that may not be available in smaller hospital settings, such as some of those in this study (Castillo & Cazarini, 2014; Sajeve & Jucevicius, 2010). Regardless, these models can assist in understanding KM in hospital contexts and explore the value derived from acquiring, sharing and applying knowledge (King, 2009). This research will explore the KM approaches of regional public hospitals and the interrelationship with CPD planning in the

allied health professions of radiography, sonography and physiotherapy. In addition, this research aims to develop a holistic model of allied health CPD and identify opportunities to improve strategies, planning and implementation of CPD and KM.

## **1.1 Research Questions**

The research study detailed in this thesis will attempt to answer the following primary and secondary research questions in the context of regional Victorian public hospitals:

1. What factors significantly influence the availability and effectiveness of continuing professional development (CPD) for allied health professionals (radiographers, sonographers and physiotherapists)?
2. How can the findings of this research be represented to improve the CPD of allied health professionals and knowledge management (KM) in regional Victorian public hospitals?

### **1.1.1 Subsidiary research questions**

In addition, this study aims to answer the following subsidiary questions that will contribute to answering the primary and secondary research questions:

- What understandings of CPD are held by managers and allied health professionals in regional Victorian public hospitals?
- How does the choice between personal, organisational or hybrid approaches to KM in regional Victorian public hospitals impact allied health professionals' CPD?
- Which competencies do hospital managers and allied health professionals consider necessary for good practice?
- What factors influence the planning of CPD programs undertaken by allied health professionals in regional Victorian public hospitals?
- How does working in regional Victorian public hospitals affect allied health professionals' knowledge and expertise?
- How does the size of regional Victorian public hospitals affect the development of professional expertise of allied health employees?

## **1.2 Significance of the Study**

At the commencement of this project, this research aligned with the Australian federal government's research priorities (Science Portfolio, 2015). The study explores the CPD of allied health professionals, which affects the efficacy of healthcare and thus contributes to health outcomes. The issues related to healthcare that require the most attention in regional Australia include the limited availability of CPD activities and the need to improve evidence-based practice (Department of Health, 2012). In addition, by exploring the perception of underdeveloped allied health CPD, this research also aligns with the Victorian government Health Priorities Framework (2012–2022) for regional areas (DHHS, 2011). These priorities were founded on perceived inadequacies of CPD and the contribution to Australia's unacceptably high medical diagnostic error rates (Graber, 2013).

## **1.3 Research Methodology**

This qualitative research study utilises embedded case studies, which are considered suitable for practice-based investigations where context is an essential factor (Yin, 2014). The primary data collection method is semi-structured interviews of hospital managers responsible for KM and allied health professionals responsible for their own CPD programs. In addition, interpretivist hermeneutic analysis will combine the participants' perceptions with knowledge from the literature incorporated into the analytic process (Giddens, 1983).

## **1.4 Project Design**

The research study described in this thesis employs embedded case studies of allied health professionals in regional public hospital settings. The case selection explores Victorian government public hospitals under Department of Health & Human Services (DHHS) oversight. The range of services available in Victorian public hospitals typically depends on community size and distance from urban centres. Therefore, the Australian Statistical Geography Standard (ASGS) was a suitable framework for expressing regionalism in this study. Regions are classified by remoteness, and include major cities; inner regional; outer regional; remote; or very remote areas. The regional hospitals selected for this research include inner and outer regional hospitals, thus allowing for exploration of the differences in access to CPD due to geographical location. In addition, the Australian Institute of Health and Welfare (AIHW) also differentiates hospitals by



peer groups, with the 2011-12 classifications considering hospital size and regional location, appropriate to meet the research objectives. Hospital size was considered relevant to the availability of formal and informal learning opportunities and community of practice availability. Therefore, hospital size in the research design is expressed as a dichotomy between small/medium and large/referral hospitals based on AIHW's public hospital peer group classifications (AIHW, 2013).

The participants in this research include hospital managers with responsibility for KM and allied health professionals who have responsibility for their CPD. Semi-structured interviews were used to explore hospitals' KM approach and the interrelationships with allied health professionals' CPD. The allied health professionals in this research play a crucial role in healthcare by providing diagnostic and therapeutic patient care services. However, allied health professions have differing degrees of professionalisation success and, consequently, differing levels of autonomy in the healthcare system (Eraut, 2000; Richardson, 1999). For the study described in this thesis, autonomy refers to practice decisions, including defining protocols and procedures relating to diagnostic medical imaging and physiotherapy assessment and treatments. This term also includes the degree to which allied health professionals can control their day-to-day practice without direct supervision or undue influence by members of the medical profession. For example, radiographers have been attributed with little autonomy (Sim & Radloff, 2009; Yelder, 2014; Yelder & Davis, 2009); sonographers with moderate autonomy (McGregor et al., 2009); and physiotherapists with high levels of autonomy (Chipchase et al., 2006). Therefore, in this study, these professions serve as a proxy for differing levels of autonomy. The final classification of participants is predicated on the different learning requirements correlated with increasing levels of expertise, resulting in a dichotomy in which early career novices and advanced beginners are compared with competent, proficient and expert professionals.

## **1.5 Data Analysis**

The interpretivist thematic analysis presented in this thesis allows the researcher to identify common themes and differences primarily from semi-structured interview data (Hackett & Strickland, 2018; Sundler et al., 2019; Vaismoradi et al., 2016). Hoepfl (1997, p. 49) describes the commonalities and differences among themes as 'pervasive' or 'idiosyncratic' respectively.

An analytical framework was developed from the literature review and guided the analysis. The initial themes identified from the literature included allied health professionals' CPD motivation, activities and planning, hospitals' KM approaches, and the influence of work structure on profession related learning. In addition to identifying these and other themes, it was crucial to compare and contrast them across the various characteristics of participants in this multi-site case study, thus conserving individuals' perspectives and contextual interrelationships (Gale et al., 2013; Ritchie & Spencer, 2002). Furthermore, thematic analytical processes represented a systematic approach at their core but also relied on the researcher's intuition (Ritchie & Spencer, 2002). Finally, the analytical processes implemented in this study included familiarisation, indexing, charting, and synthesising data (Spencer et al., 2013).

## **1.6 Outcomes**

Previous recommendations for further research have included identifying the types of knowledge required for healthcare professional practice and whether day-to-day work activities support profession related learning (Billett, 2016). The study detailed in this thesis explores gaps identified in the literature regarding allied health professionals' CPD planning, competencies considered necessary for safe and effective healthcare practice and the contribution of informal day-to-day work to professionals' knowledge and skills. In addition, the influence of regional location and hospital size is also examined. These demographic factors may affect the feasibility of hospitals providing challenging day-to-day work and collaboration with expert colleagues, which the literature suggests might improve professional learning (Eraut, 2011). Finally, the use of qualitative methods in this study may also help address the lack of studies expressing the voice of the allied health professionals.

Furthermore, this study has contributed to developing a holistic model of the inter-relationships regarding allied health professionals' CPD. The knowledge derived from this study may lead to practical benefits by identifying opportunities to improve CPD planning and implementation, thus improving the effectiveness and efficiency of allied health professionals' practice. Any resultant improvements in evidence-based practice may contribute to more appropriate and cost-effective healthcare for the approximately 30% of Australians living in regional areas (Department of Health, 2012).

## **1.7 Thesis Structure**

Following this introduction, Chapter 2 reviews CPD-related literature. However, due to the holistic nature of this study, the review encompasses the works of literature regarding the sociology of professions, adult education and KM, contributing to the CPD literature in general and allied health professionals' CPD in particular. In addition, this chapter concludes by summarising the literature and identifying various knowledge gaps. Chapter 3 explores the context of this study into allied health CPD, including the Australian healthcare system; Victorian public hospitals; regional healthcare; allied health professions; and KM in hospital settings. The methodology and methods of this study are described in Chapter 4. In addition, the chapter provides an overview and discussion of the philosophical assumptions, paradigmatic bases, and the research strategy underpinning the use of the embedded multi-site case studies. Finally, Chapter 4 describes research processes, including case hospital and participant selection criteria and the rationale for reliance on semi-structured interviews as the primary data source.

Chapter 5 presents the thematic analysis and findings of the embedded case studies, which outlines the critical differences in CPD related to the various characteristics of case hospitals and professions. In addition, the analysis compares the significant similarities and differences among the cases. These considerations explore the three professions in this study, hospitals' geographical location, inner or outer regional location, and their relative size as either small/medium or large/referral hospitals. The research discussion and overview follow in Chapter 6 and considers the answers to the primary, secondary and subsidiary research questions. First, the thematic analysis and findings of the previous chapter are discussed in light of the existing literature. Next, discussion is structured around answering the subsidiary research questions and encapsulated in answers to the primary and secondary research questions, including proffering a holistic model of CPD for allied health professionals. Finally, the conclusion in Chapter 7 presents a review of the study, the contributions of this research to the theory and practice of CPD in allied health, the limitations of the study and the recommendations for future research.

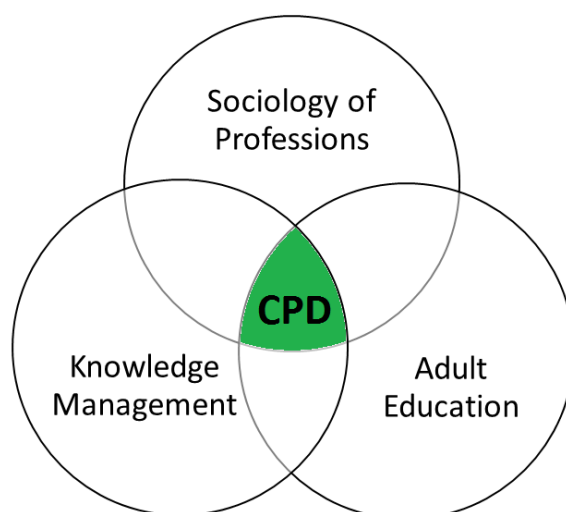
## 2 Literature Review

As mentioned in the introduction (Chapter 1), the research to be reported in the thesis aims to increase knowledge and understanding of allied health professionals' continuing professional development (CPD). The purposefully selected radiography, sonography, and physiotherapy professions participating in this study are integral in providing diagnostic and therapeutic services in hospital settings. Therefore, the members of these professions need to maintain currency in their disciplines, requiring them to implement CPD programs to maintain and enhance knowledge and skills throughout their careers. The context of this research is regional Victorian public hospitals, discussed in Chapter 3, and this study also explores the interaction between CPD and hospitals' knowledge management (KM) approaches. Therefore, the study will explore hospitals' efforts to control and exploit knowledge through KM, which may deliberately or inadvertently affect profession related knowledge-seeking and sharing behaviours. In addition, significant gaps are evident in the literature regarding CPD planning for allied health professionals and the contribution of informal day-to-day work to profession related knowledge and skill acquisition.

The review includes three overlapping works of literature regarding the sociology of professions, KM and adult education, as illustrated in Figure 1.

**Figure 1**

*Foundation Literatures of CPD – Overlapping Sets*



*Note:* Venn diagram of overlapping sets representing the literature related to: sociology of professions, knowledge management and adult education, with the literature related to allied health professions' CPD located in the zone of overlap.

The improved understanding of radiographers, sonographers and physiotherapists' CPD and hospitals' KM from this study is an antecedent for developing a normative model of allied health professionals' CPD. The following sections in this chapter review published research and literature related to allied health professionals' CPD and hospitals' KM. The purpose of the review was to obtain a holistic understanding of CPD within hospital contexts. In addition, the review also includes the topics of allied health professions, CPD activities, CPD in allied health, CPD planning, and taxonomy of professional competencies. The sources of information for this study were peer-reviewed journal publications and books, collected after database and Google Scholar Internet keyword searches, tracking listed references through backward- and forward-snowballing of citations, and obtaining publicly available documents from relevant government and non-government organisations' websites.

The literature review includes peer-reviewed publications, books, and publicly available Internet documents that postdate the research design phase and data collection from the semi-structured interviews for this study (2015-2017). Although the publications facilitate a more up-to-date literature review, the published articles have not necessitated changes to the study design.

The structure of the literature review revolves around three overlapping bodies of work, beginning with the sociology of professions (section 2.1), with subsections including the characteristics of professions; professionalism; professions and modern organisational forms; allied health professions; and professionalisation in allied health. Secondly, the review explores KM (section 2.2), with subsections including the nature of knowledge; and knowledge management models. Thirdly, the review explores adult education literature (section 2.3) with subsections including adult learning (andragogy); and social learning. Finally, the review explores CPD with a more significant focus (section 2.4), containing numerous subsections that detail factors regarding CPD derived from the literature and relevant to the research reported in the thesis.

## **2.1 The Sociology of Professions**

An integral part of the concept of professions is an expectation of meeting highly-valued needs in society, thus elevating an occupation's social standing. To solve some of the challenges that confront day-to-day lives, laypeople often seek help from people with relevant knowledge, skills and experience in specialised occupations. The professionals with whom they engage can apply their expert knowledge and enable people to mitigate

some of the uncertainties challenging them (Evetts, 2013). Moreover, inherent to the notion of professions is a public expectation that professionals will provide solutions for the needs of society that are above and beyond the expectations placed upon other occupational groups (Schön, 1991). The following six subsections explore the sociological construct of professions, the nature of professionalism, and professional roles in modern-day healthcare organisations (2.1.1 - 2.1.3). In addition, the final subsections explore allied health professions, professionalisation generally, and as it relates to allied health professions in particular (2.1.4 - 2.1.6). Therefore, providing important background information to the study presented in this thesis.

### **2.1.1 Characteristics of professions**

Professional occupations require specialised knowledge and expertise to undertake their work safely and effectively, and this requires a solid commitment to ongoing profession related learning. The foundational concept of ‘profession’ is a sociological construct generally applied to occupational groups with specialised, well-trained, dedicated members serving the public interest (Elliott, 1972; Popkewitz, 1994). Freidson (2001) describes the elements of the ‘ideal’ profession, which include having specialised knowledge and skills; exclusive jurisdiction; a credential-based position; formal higher education training; deference for goodness above economic gain and quality above economic efficiency. In addition, other commonly cited characteristics of professions include the requirement for a ‘noble work ethic’; high-quality work; a shared ethical code; autonomy of practice; influence regarding rewards, and a solid commitment to professional development (Pekkola et al., 2018; Popkewitz, 1994; Richardson, 1999). Medicine is considered the archetype ‘profession’ or original model that other professions aspire to emulate (Freidson, 1988; Willis et al., 2016). The profession of medicine achieved social dominance, sustained by a long history of social influence (Butler, 2011; Eraut, 2000). The social and political power of healthcare professions such as medicine derives from a perception of illness and disease being so substantial and of such significant concern that individuals and the state trust these professionals’ specialised knowledge and judgment to determine the best treatment options.

The ideals of being ‘scientific’ and guided by ‘goodness’ were paramount in demarcating occupational domains in the historical development of professions (Burns, 2019a). However, defining the functionalism of professions is now regarded as contributing little to understanding power relationships in healthcare groups such as medicine or

understanding contemporary notions of professionalism in other occupations (Brante, 1988; Burns, 2019a; Evetts, 2013). Nevertheless, authors continue to attempt to define the essence of professions as the political influence that shapes the division of labour:

Professions are simply a historically contingent, useful, invention. They comprise one possible occupational arrangement in the modern division of labour. They are institutions and structures that were invented in Western modernity and then repeatedly reinvented. Professions evidence continuing adaptation and regulatory oversight (Burns, 2019a, p. 24).

Some research findings have a more conspiratorial tone by identifying professions as an expression of male-dominated, privileged, self-interested social elitism (Ayala, 2020; Egetenmeyer et al., 2019; Evetts, 2013; Susskind & Susskind, 2018). Efforts by society and the state to subdue the power and influence of professions through increased government regulation represent a perceived need to curb negative aspects of professional autonomy and self-interest (Martin et al., 2015). However, contemporary theorists usually regard professions as ‘knowledge-based’ occupations that require tertiary education and combine that initial training with ongoing self-directed education (Ayala, 2020).

The evolution of professions has facilitated profound societal changes, with transformations in science, technology and social aspects of the industrialised Western world. Professional disciplines have developed to manage and utilise large volumes of theoretical knowledge and practical expertise. Therefore, the social importance of particular professions reflects the symbolism, economic value, degree of privilege and level of trust endowed to each (Freidson, 2001; Susskind & Susskind, 2018). One component of the reciprocal benefit society expects is that members of professions accept responsibility for maintaining and enhancing their specific areas of specialised knowledge and practical expertise.

In summary, the notion of ‘profession’ is a sociological construct and generally, among various other prerequisites, the term applies to occupations with specialised knowledge and skills. In addition, professionals are expected to produce high-quality work and have a solid commitment to ongoing CPD. Finally, society and the state expect professional disciplines to have the knowledge, skills and expertise to undertake their work safely and with high levels of efficacy.

### **2.1.2 Professionalism**

As described in the previous subsection, society expects members of professions to exhibit ‘professionalism’, defined by the superior performance and behaviour expected in

their day-to-day work. The conceptual dimension of professionalism addresses professionals' values, discourses, identity, and expected normative behaviours (Burns, 2019a, 2019b; Evetts, 2013; Pekkola et al., 2018). Furthermore, professionalism suggests that higher compensation will be forthcoming in return for societies' high degree of trust and the expectation that professionals are knowledgeable, skilful, and trustworthy.

### **Professional Socialisation**

However, societies' expectations regarding professions are not always naturally occurring for all members, requiring some to learn new attitudes and behaviours. The process whereby students and new members of a profession learn their values, attitudes, and beliefs is known as professional socialisation or enculturation. New students begin their university education with a unique worldview; however, undergraduate education strongly influences the enculturation of students. This socialisation occurs through numerous individual social exchanges from which students incrementally assimilate a consensus of acceptable behaviour. However, despite having explicit and implicit normative values, professions can still have 'bad apples' as members (Burns, 2019a; Dixon-Woods et al., 2011), and they may be challenging to identify:

Society needs the service of articulate, clever, society-orientated actors and professionals. But as with any human endeavour, activity and institution – from the microscale such as family to the macroscale such as religious systems and corporations – power corrupts, or can corrupt, and self-interest or absorption distorts the simple delivery of care and benefit (Burns, 2019a, p. 240).

University teaching processes enable convergence toward a 'professional paradigm' to prepare students for future professional responsibilities (Richardson, 1999).

### **2.1.3 Professions and modern organisational forms**

A significant shift in research focus on professions occurred in the 1980s when interest turned towards the system of professions. The foundation of this interest was open systems theory which explained the interconnection between professions and organisational environments (Pekkola et al., 2018). However, this departed from researching how professions are structured to define the tensions between professionals and the organisations that employ them (Freidson, 2001). This approach uses an ecological system metaphor to describe occupational settings and facilitates research of the external social forces that contribute to shaping professions (Ayala, 2020). Western countries' capitalist economies and government bureaucracies also play a role in the ecological metaphor. Hence, Freidson (2001) described three functional systems,



including the market, with activities driven by forces of supply and demand, and the bureaucracy, with control exerted by state administration and influenced by large organisations. In addition, professionalism was described as the third functional system or ‘third logic’, where professional associations influence the work of their members (Freidson, 2001). Theorists hoped that professionalism might counterbalance the power of organisations by working for the benefit of clients.

In contrast, organisations that employ professionals have somewhat of a human resources management dilemma, requiring simultaneous control and development of these employees. Moreover, the factors that socially elevate professions above other occupations, including intellectual supremacy, esoteric knowledge and skills, autonomy of practice, and an intrinsic commitment to professional development, also make professionals less amenable to control measures (Evetts, 2013; Freidson, 2001). In addition, public perception of a lack of transparency in the management of professional organisations has weakened professional credibility when managers prioritise market forces at the expense of professions’ previously held ‘noble work ethic’ (Freidson, 2001; Popkewitz, 1994). Nevertheless, organisations that employ professionals have the opportunity to exploit the ideology of professionalism to encourage self-motivation and a commitment to the ongoing CPD of their employees. Therefore, one aspect of this research study will reveal the interactions between public hospitals and allied health professionals regarding their ongoing learning of profession related knowledge.

#### **2.1.4 Allied health professions**

The division of labour in Australian healthcare settings segregates different professions. For example, specialised knowledge and areas of clinical practice distinguish nurses, medical practitioners and allied health professionals. All healthcare professionals in Australia require an initial intensive education, followed by accreditation to practice within their profession. In addition, they must comply with government regulations to maintain practice standards. The numerous allied health professions play a critical and expanding role in healthcare, providing diagnostic and therapeutic patient care services; the list provided in Table 1 indicates the diversity of allied health disciplines.

Allied health professionals are typically described as having a patient care role; being represented by a professional association; having a code of ethics; needing a university health science bachelor’s degree or higher; and requiring national accreditation to practice (AHPA, 2015).

**Table 1***Australian Allied Health Professionals*

Audiologists;	Occupational Therapists;	Podiatrists;
Chiropractors;	Orthoptists;	Perfusionists;
Diabetes Educators	Orthotists/Prosthetists;	Psychologists;
Dietitians;	Osteopaths;	Radiographers;
Exercise Physiologists;	Paramedics;	Social Workers;
Genetic Counsellors;	Hospital Pharmacists;	Sonographers; and
Music Therapists;	Physiotherapists;	Speech Pathologists.

*Note:* Although some professions meet Allied Health Professions Australia (AHPA) criteria, nursing and private pharmacy professions distance themselves in industrial relations matters from other allied health professions. In addition, some professions listed are also unlikely to be hospital-based, including Chiropractic and Osteopathy. Adapted from Definition of Allied Health, 2015 ([ahpa.com.au/Home/DefinitionofAlliedHealth.aspx](http://ahpa.com.au/Home/DefinitionofAlliedHealth.aspx)). In the public domain.

The complexity of the healthcare system in Australia is such that the distribution of public versus private and hospital versus community allied health professional services may be difficult or impossible to quantify. Although Australian government departments do not have comparable definitions of allied health, government reports provide some information on individual allied health professions, including two in this study. For example, in 2019, 25% of physiotherapists in Australia were employed in private group practices; 14% in private solo practices; 19.5% in hospitals; with the remaining 41.5% working in other government and non-government organisations (Department of Health, 2021). In contrast, 33% of radiographers in Australia worked in private group practices; five percent in private solo practices; 55% in hospitals; with the remaining seven percent employed by other government and non-government organisations (Department of Health, 2021). However, the third group of allied health professionals in this study are regulated by ASAR who do not provide statistics detailing the distribution of workplace settings for sonographers throughout Australia.

### **2.1.5 Professionalisation**

The historical progression of professions demonstrates how some occupations have gained an elite social status through professionalisation. This process encompasses the characteristics that contribute to an occupation's claim for acceptance as a profession and incorporates three social dimensions: 1) power relationships between professions and their clients; 2) relationships with other occupational groups; 3) and relationships between professions, society and government (Pekkola et al., 2018). In addition, the process of

professionalisation requires the active participation of an occupational collective, demonstrating to society that the profession is working towards the ideals of professionalism (Richardson, 1999). The goals of professionalisation include understanding an increasingly complex knowledge base, continually refining practice, and being highly sensitive to ethical issues. Therefore, individuals' engagement in lifelong learning and encouraging ongoing appraisal of professional aspirations in response to societal change are central to professionalisation (Houle, 1961, 1980).

### **2.1.6 The professionalisation of allied health professions**

As discussed previously, in sociological terms the medical profession is considered an archetype of the process by which an occupation achieves social dominance. Once achieved, the profession establishes a monopoly by using the social and political means of role establishment and boundary maintenance (Ayala, 2020; Butler, 2011; Eraut, 2000; Larkin, 1978; Nancarrow & Borthwick, 2021). However, the increasing complexity of technological development has resulted in more sophisticated work processes and increased specialisation in many occupations, including medicine (Rosenberg, 2002; Warner, 2014). These changes have culminated in numerous professional disciplines associated with healthcare, historically labelled as 'professions supplementary to medicine' (Ayala, 2020; King et al., 2015; Larkin, 1978; Nancarrow & Borthwick, 2021; Yelder, 2014). These professions, now collectively known as allied health, are attempting to simulate the ideal professional type, but this has resulted in various degrees of success and disparate levels of autonomous practice (Eraut, 2000). For example, the low independence manifested in radiography has been attributed to a 'subservient mindset' (Sim & Radloff, 2009) and sonography was found to have moderate levels of autonomy (McGregor et al., 2009). In contrast, physiotherapy has exhibited high levels of independence (Chipchase et al., 2006). These three professions have different historical boundary protection challenges with the profession of medicine, some of which continue until the present day and are discussed further in Chapter 3.

Australian radiographers and sonographers have been purposefully exploring career progression in efforts to increase their autonomy for some years. In keeping with international developments of role expansion, these professionals' scope of practice and 'role extension' has extended into areas previously designated as roles of other medical professionals (AIR, 2014; Yelder, 2014). In addition, the Australian government and professional bodies acknowledge advanced practitioner roles in the disciplines of

radiography, sonography (AIR, 2014) and physiotherapy (DHHS, 2016; Thompson et al., 2014).

The professionalisation of radiography, sonography and physiotherapy is a relatively recent phenomenon compared to the long history of professionalisation in medicine. Nevertheless, despite support for advanced practitioner roles, radiographers have demonstrated a culture of subservience and apathy relative to other professions in the broader healthcare field (Sim & Radloff, 2009; Yelder, 2014). The lack of confidence among radiographers is attributable to the continued dominance of medicine (Sim & Radloff, 2009; Yelder, 2014; Yelder & Davis, 2009). In the early 1900s, the medical profession successfully limited the role of radiographers to being subordinate within hierarchical radiology departments (Yelder, 2014). Subsequently, this limitation has developed into a professional identity characterised by feeling under-appreciated and resulting in an inferiority complex (Lewis et al., 2008).

Further evidence suggests that this professional identity remains; “The fight for professional recognition is hampered by feelings of subordination and the ‘just the radiographer’ syndrome which incites low self-esteem, inferiority complex, and apathy” (Naylor et al., 2022). The socialisation of radiographers into a culture of compliance within radiology teams has been suggested as leading to behaviours that discourage innovation and self-improvement (Sim & Radloff, 2009; Yelder, 2014; Yelder & Davis, 2009). The resulting workplace culture may not support the high self-esteem or confidence necessary to have meaningful discussions with other healthcare professionals or engage in an appropriate level of CPD.

In summary, the characteristics contributing to an occupation’s claim to be a profession incorporate, among other things, a preferential relationship between the profession, society and government. History shows that some occupations press to improve their social status through professionalisation, which requires the active participation of an occupation’s collective to understand complex profession related knowledge and refine practice. Therefore, one of the centrepieces of professionalisation is engagement in life-long CPD, which is the focus of the research project detailed in this thesis. However, many allied health professionals work in hospital settings, and their CPD is also affected by the policies and processes of the organisations which employ them. Therefore, hospital processes governing profession related knowledge management are also integral to this study and are discussed in the following section.

## **2.2 Knowledge Management**

The management systems organisations use to control knowledge assets for their benefit are collectively known as knowledge management (KM). One commonly used definition acknowledges managing the link between explicit and tacit knowledge: “Knowledge management is concerned with the exploitation and development of the knowledge assets of an organisation with a view to furthering the organisation's objectives. The managed knowledge includes explicit, documented knowledge, and tacit, subjective knowledge” (Rowley, 1999, p. 418).

Organisational KM has become more relevant due to dynamic and uncertain worldwide social and economic climates (Choi et al., 2008). The main goal of KM is to reduce knowledge deficits by identifying, developing and diffusing knowledge throughout an organisation to increase its competitiveness (Rubtcova & Pavenkov, 2018). Managers’ responsibilities include implementing knowledge seeking and sharing, and learning processes that stimulate the flow of knowledge among individuals and groups in their organisations (Sanchez, 2006). KM efforts also include the social relationships encouraged by the organisation that enable knowledge sharing and allow the linking of tacit and explicit knowledge (Mittal & Kumar, 2019). This research explores whether hospital managers consider the social interactions that facilitate professional learning.

This section of the literature review provides background knowledge to assist in answering the subsidiary research question:

- How does the choice between a personal, organisational or hybrid approach to KM in regional Victorian public hospitals impact the CPD undertaken by allied health professionals?

The following subsections explore the nature of explicit and implicit types of knowledge, followed by a review of social capital theory related to KM (subsections 2.2.1 - 2.2.2). In addition, the final subsection will explore theoretical KM models that aim to maximise the benefits of knowledge management in professional organisations (subsection 2.2.3).

### **2.2.1 The nature of knowledge**

This subsection explores the nature of knowledge and understanding this concept is necessary to understand knowledge seeking and sharing in hospital settings satisfactorily. Professional knowledge and expertise combine profession-specific knowledge from

tertiary study and professional development and the experiential knowledge of practice due to work experience (Markauskaite & Goodyear, 2017). In addition, individual employees of an organisation have implicit knowledge that contributes to business functions and its success (Mittal & Kumar, 2019). Furthermore, employees may also form formal groups and communities of practices (CoPs) representing more specific functions and processes (Wenger-Trayner & Wenger-Trayner, 2015; Wenger, 1990).

Regarding the nature of knowledge, some authors distinguish between ‘information’ and ‘knowledge’, proposing that knowledge always involves the cognition of the human mind (Albán et al., 2020; van Beveren, 2002). Learning new knowledge occurs through classical or operant conditioning from perceived consequences involving practical applications of new information (Bitterman, 2006; Usman & Ogbu, 2019). The distinction between information and knowledge is the foundation for two fundamentally different perspectives of KM, following either an organisational knowledge or personal knowledge approach. Organisational KM approaches rely on explicit and documented information in artefacts such as written policies and protocol manuals. In contrast, personal KM approaches rely on significant amounts of profession related knowledge residing in the minds of individuals, with knowledge sharing enabled through planned interactions.

Exponents of an organisational KM approach espouse formal processes to create and distribute knowledge assets throughout an organisation. These knowledge assets include codified explicit information in documents such as patents, manuals and best-practice databases (van Beveren, 2002). This approach advocates a ‘near tangible view’ of knowledge, assuming that they can articulate the knowledge held by individuals, making this explicit or tangible to others (Hadjimichael & Tsoukas, 2019; Nonaka, 1994; Nonaka & Takeuchi, 1995). Hence, the rise of information and computer technology (ICT) in contemporary professional practice allows explicit forms of knowledge to be dispersed rapidly throughout an organisation or professional discipline (Markauskaite & Goodyear, 2017; Sheng et al., 2013). However, Nonaka (1994) suggests that organisational knowledge results from the complex relationships between explicit codified knowledge and personally held tacit knowledge.

Tacit knowledge has long been considered intangible, “knowing of more than you can tell” (Polanyi, 1961, p. 466), thus making it difficult to articulate and communicate. As a result, the personal knowledge approach towards KM takes a ‘distributed view’ of tacit knowledge (Hadjimichael & Tsoukas, 2019; Tsoukas, 1996), which builds on

assumptions that tacit understanding is integral to all knowledge and, therefore, cannot always be codified or made explicit:

The operations of implicit learning are shown to take place independently of consciousness; their mental products have been demonstrated to be held tacitly; their functional controlling properties have been shown to operate largely outside of awareness (Reber, 1989, p. 233).

Some authors further divide tacit knowledge into 'basic' tacit knowledge, developed by routine everyday experience, and 'complex' tacit knowledge, which is related to more expert and intuitive understanding (Abidi et al., 2005). For knowledge-intensive allied health professions, implementing the personal knowledge approach to solve practice problems requires allowing appropriate time for reflection on previous actions (Nonaka, 1994). Therefore, management practices based on the personal knowledge approach allow time for reflection, create interactions between individuals, and encourage them to share their ideas with others (M. Smith et al., 2009). However, a difficulty with the personal knowledge approach is that an individual's tacit knowledge and expertise will accompany them when they depart an organisation.

In summary, understanding the nature of knowledge is needed to benefit fully from knowledge seeking and sharing in hospital settings. Profession related knowledge and expertise combine theoretical knowledge and on-the-job experience; however, the organisational knowledge approach relies on explicit written protocol manuals whereas a personal KM approach relies on the knowledge residing within individual minds. Therefore, this study explores whether a hospital's KM practices favour an organisational or personal knowledge approach. In addition, if using a personal knowledge approach, the study explores whether the appropriate time is allowed for reflective practice and whether knowledge sharing among allied health professionals is encouraged.

### **2.2.2 Social Capital Theory**

The personal knowledge approach described in the previous subsection suggests that individual employees personally hold tacit knowledge. However, social capital theory proposes another perspective on organisational knowledge retention. This theory proposes that the knowledge embedded in organisational networks is accessible through the social interrelationships among networks of individual employees (Granovetter, 1973; Granovetter, 2003; Nahapiet & Ghoshal, 1998). The shared knowledge within social networks results from social ties and ethical commitment between individual network members (Brown & Duguid, 1991; Duguid, 2005). Related to the study in this thesis, the

personal knowledge approach sometimes adopted in healthcare organisations has been described as comparable to a complex ecological system (Malhotra, 2008) or a complex ‘landscape of practices’ (Wenger-Trayner & Wenger-Trayner, 2015). Therefore, from a social capital perspective, it is unusual for individual turnover or staff mobility to undermine the viability of a social network because the culture of collaboration and knowledge sharing will be preserved (Bourdieu, 2008).

### **2.2.3 Knowledge management models**

As discussed previously, definitions of KM frequently acknowledge organisational efforts to exploit knowledge for their benefit. In addition, various researchers have proffered organisational KM models to analyse knowledge-seeking and sharing behaviours. These models are intended to aid the understanding of cause and effect relationships present in organisational learning processes. However, many KM systems are complex, and sometimes, there are unforeseen effects on strategy and information management. Therefore, it would be unrealistic to expect any KM model to provide an in-depth analysis of all organisational contingencies. These models are typically conceptual and often include diagrammatic representations of those ideas. The literature includes models of KM that exhibit different attributes, which Castillo and Cazarini (2014) grouped as either process-oriented; social/technical enablers; contingency; or knowledge-oriented models. Therefore, these groupings are now described in turn.

#### **Process-oriented models**

Many organisational KM models are classified as ‘process-oriented’ and seek to demonstrate how knowledge adds value by analysing processes such as creating, capturing, sharing and applying knowledge. Working towards a unified framework, Shongwe (2016) assessed twenty published process-oriented models and described the most common KM processes, including knowledge acquisition, creation, transfer, storage, and application.

Firstly, knowledge acquisition involves searching the external environment and introducing any new-found information into the organisation (Shongwe, 2016). In addition, contextualising knowledge is necessary to enhance understanding for those who apply it to their practice. The sources of new knowledge can be customers, competitors and suppliers, and are utilised by “extracting, interpreting and transferring knowledge” to enhance organisational knowledge assets (Pacharapha & Ractham, 2012, p. 726). Once knowledge is acquired, new knowledge creation can enhance existing explicit or tacit



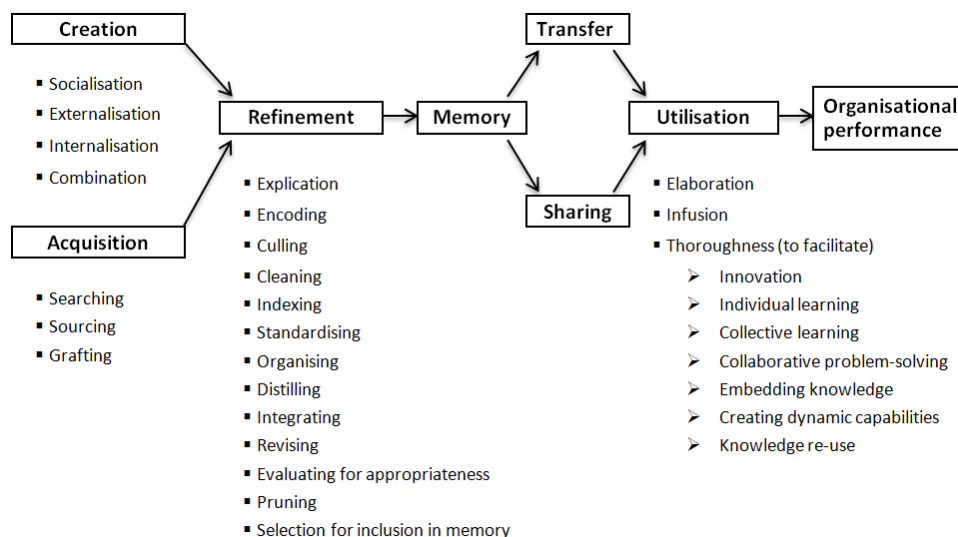
knowledge, thus value-adding to an existing service or product. The knowledge creation process may arise due to in-service education, practice experience and collaborative work with colleagues, and is prominent in the KM models of Nonaka and Takeuchi (1995) and Sheng et al. (2013).

New knowledge then needs to be transferred or communicated to other people in the organisation, through face-to-face interactions such as formal education seminars and informal learning through collegial work. Organisational approaches to KM also require storing knowledge as physical artefacts such as policies and protocol manuals. In addition, knowledge may be stored electronically in ICT databases and portals, contributing to an ‘organisational memory’ (Samoilenko and Nahar (2013). Finally, the application of knowledge in organisational KM approaches occurs through personal use of stored explicit information. Examples of KM models featuring knowledge transfer and application include Holsapple and Joshi (2002) and Gottschalk (2006).

In addition to the models described above, alternative process-oriented KM models offer a more holistic approach, as seen in King (2009) model, presented in Figure 2. The model involves stages of creation or acquisition, refinement, memory, transfer or sharing, and utilisation, culminating in the expectation of improved organisational performance.

**Figure 2**

*Knowledge Management Process Model*



*Note.* Process oriented model of knowledge management. From Knowledge Management and Organizational Learning in Annals of Information Systems (Vol 4, p. 7), by William R. King (Ed), 2009, New York, USA: Copyright 2009 by Springer. Reprinted with permission.

Process-oriented KM models acknowledge the exploitation of both codified explicit knowledge and employees' tacit knowledge. King's (2009) model aims to demonstrate how these processes allow people with less expertise to learn from those with more.

### **Social and technical enabler models**

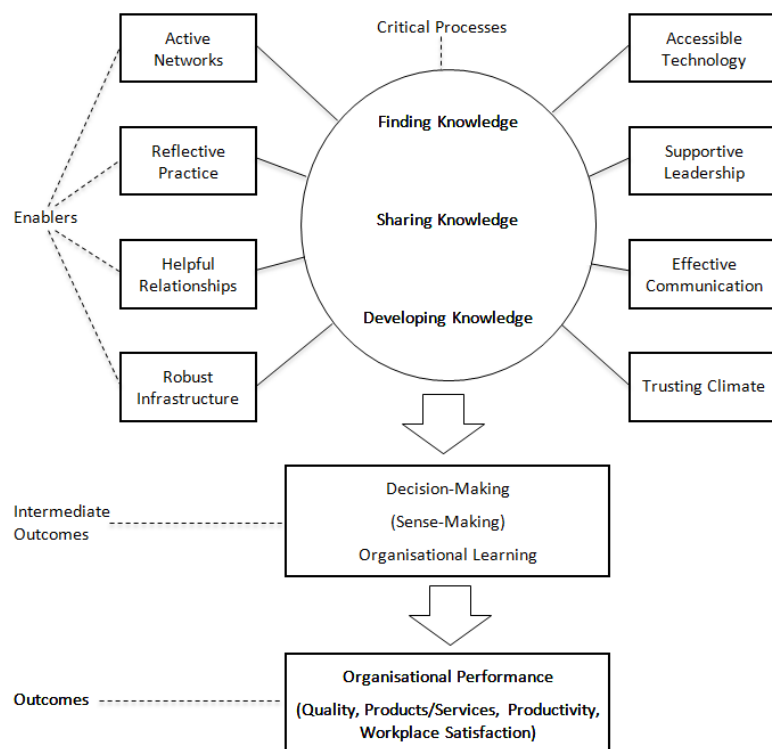
In contrast to temporally-based process models as previously discussed, enabler models seek to identify facilitating or motivating factors in knowledge seeking and sharing. KM models of social and technological enablers are predicated on the tacit aspects of human knowledge. In addition, these models suggest that technology adoption coupled with improved social relationships will positively influence knowledge-sharing behaviour (Nonaka, 1994; Reber, 1989). Various models of this type incorporate the social aspects of interpersonal communication. In addition, they attempt to explain the influence of personal motivation and the need for people to cognitively absorb new information before choosing behaviours that serve their interests best (Fu & Lee, 2005; Orzano et al., 2008; Sussman & Siegal, 2003). Knowledge sharing capitalising on social and technical factors can be crucial to optimising success in professional healthcare organisations.

Among two prominent social and technical enabler models, the social factors specified in a model by Fu and Lee (2005) include emotional responses; perceived consequences; perceived usefulness; perceived ease of use of ICT technology; facilitating conditions; and the degree of trust in management. In addition, this model incorporates many of the social factors discussed in earlier psychological research by Triandis (1980), who attempted to understand motivation and behaviour more generally in social settings.

A second example of enabler models was proposed by Orzano et al. (2008) and described enabling factors necessary for the success of organisational KM systems, as represented in Figure 3. The developers of this KM model suggested that merely having and using the abundantly available operational information was no longer appropriate in rapidly evolving healthcare environments (Orzano et al., 2008). Instead, they suggested a need to understand and exploit the inherent value of profession related knowledge.

**Figure 3**

*Knowledge Management Model*



*Note:* A social and technical enabler model example. From A knowledge management model: Implications for enhancing quality in health care, by Author John A Orzano, Claire R McInerney, David Scharf, Alfred F Tallia, Benjamin F Crabtree, 2008, Journal of the American Society for Information Science and Technology, Volume 59 (3), pp. 489-505, doi:10.1002/asi.20763. Copyright 2007 by John Wiley and Sons. Reprinted with permission.

Therefore, Orzano et al. (2008) developed a KM model considered more appropriate for contemporary healthcare organisations and allied health professionals. The model explores the subjective factors that affect the adoption of KM in a healthcare setting. The KM enabling factors that the authors considered influential in their model include a robust ICT infrastructure; accessible technology; supportive leadership; helpful relationships; a culture of trust; effective communication; reflective practice; and active social networks. In addition, the model suggests that achieving the desired outcomes should result in organisational learning and improved organisational performance. Social and technical enabler models are predicated on motivations serving personal interests. Furthermore, the models suggest that hospital managers should align individual and organisational interests for the best healthcare outcomes.

Unfortunately, empirical research is lacking regarding the effectiveness of enabler models and therefore, these models continue to be theoretically based and aspirational (Panahi et al., 2013). Nevertheless, the social factors that influence the knowledge-seeking and sharing behaviours of allied health professionals are essential to the research reported in this thesis. Based on enabler models' putative assumptions, an individual's motivation should affect the success of hospitals' KM practices.

In summary, social and technological enabler models seek to identify facilitating or motivating factors in KM. These models are predicated on tacit knowledge, suggesting that improving social relationships will increase knowledge-seeking behaviour. Among two prominent enabler models, Fu and Lee (2005) incorporate many social factors discussed in psychological research into human motivation and behaviour. Another example of an enabler model proposed by Orzano et al. (2008) described success factors for organisational KM systems (Figure 3). This model aims to address rapidly evolving healthcare environments needing to exploit profession related knowledge. Therefore, their model explores the subjective factors aligning with this study, affecting the adoption of KM, including supportive leadership, helpful relationships, and reflective practice.

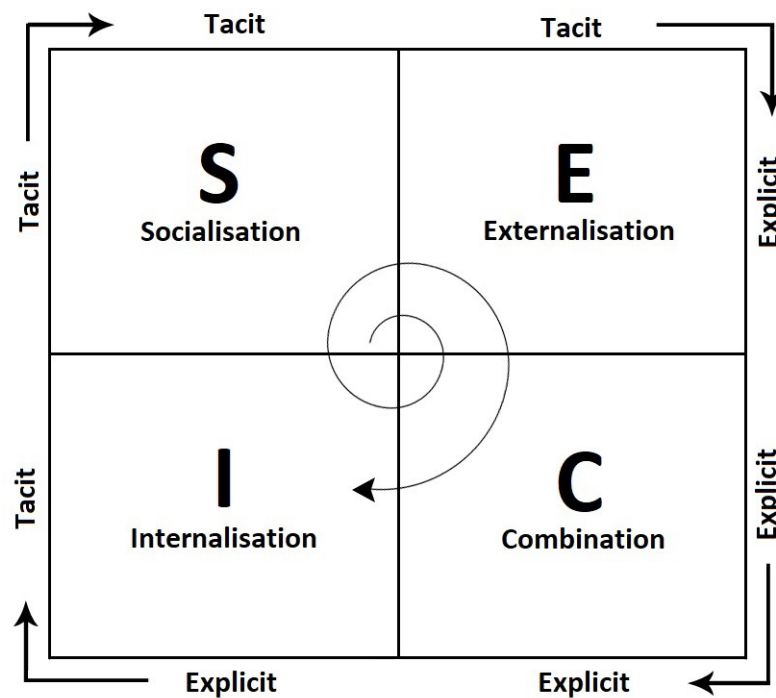
### **Knowledge-oriented models**

Models of social and technological enablers deal with technology adoption and improved interpersonal relationships. In contrast, knowledge-oriented models are based on seminal notions of explicit and tacit knowledge described by Polanyi (1961). The exploitation of knowledge assets is central to knowledge-oriented models of KM, as they focus on the intellectual capital of individual employees and maximising organisational memory. Influential research presented by Nonaka and Takeuchi (1995) as the SECI model of knowledge creation and transfer is represented in Figure 4. In addition, the model also forms the foundation of subsequent knowledge creation and transfer frameworks (Mittal & Kumar, 2019).

The two axes of the grid in Nonaka and Takeuchi's (1995) model depict explicit and tacit knowledge assets in an organisation. In addition, they demonstrate pathways whereby knowledge can be created and shared through intentionally managed interactions between explicit and tacit organisational knowledge. Therefore, the four knowledge conversion interactions facilitate the transfer of knowledge to other people or a different form of knowledge. The conversion processes include socialisation, externalisation, combination and internalisation (Nonaka, 1994; Nonaka & Takeuchi, 1995).

**Figure 4**

*SECI Model of Knowledge Creation*



*Note:* The SECI model of knowledge creation is represented diagrammatically by four significant knowledge conversion processes set out in a grid format. Adapted from *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation* (p. 62), by Ikujiro Nonaka. Hirotaka Takeuchi. 1995, Oxford, UK: Copyright 1995 by Oxford University Press. Adapted with permission.

The process of socialisation relies on tacit to tacit knowledge exchange through face-to-face interactions and the direct observation of colleagues at work. Whereas, externalisation involves tacit to explicit knowledge exchange and is considered a complex but essential process in which personally held tacit knowledge is codified and disseminated throughout the organisation. However, some researchers believe that personally held tacit knowledge is almost impossible to codify and usually fails (Mittal & Kumar, 2019). Furthermore, the combination process for two or more sources of explicit knowledge is the most uncomplicated, where disparate codified knowledge is combined to create new knowledge. Finally, explicit to tacit knowledge conversion is achieved through internalisation, involving learning from codified sources of knowledge coupled with modifying personally held tacit knowledge.

Other knowledge-oriented models present frameworks for building organisational KM capabilities (Abidi et al., 2005; Lee & Kim, 2001). They propose the strategic control of significant knowledge assets, including organisational knowledge; workers' knowledge; and ICT technologies. Abidi et al. (2005) suggest capturing the tacit knowledge of

healthcare workers by utilising the ‘externalisation’ process of Nonaka and Takeuchi (1995). They propose that tacit knowledge could be extracted via ‘crystallization’, using hypothetical clinical scenarios and validating outcomes by experts (Abidi et al., 2005). However, this approach would require substantial resources and a significant time commitment from health professionals, neither of which may be available in the smaller hospital settings that provide the context for the study detailed in this thesis.

Some examples of holistic KM models exist (Castillo & Cazarini, 2014; Sajeve & Jucevicius, 2010); however, many are based on research conducted in large organisations and they are acknowledged as being unsuitable for smaller or public sector organisations. Added to this limitation for small organisations, around 50% of KM projects are known to fail and even more fail to meet expectations (Akhavan et al., 2005).

In summary, knowledge-oriented models build on explicit and tacit knowledge notions, focusing on employees’ intellectual capital. For example, the enduring SECI knowledge creation and transfer model by Nonaka and Takeuchi (1995), presented in Figure 4 details knowledge conversion processes between explicit and tacit organisational knowledge assets. The best outcomes for KM projects depend on a well-considered corporate strategy; understanding the existing sources of knowledge; developing appropriate processes in the organisation; and gaining the support of essential stakeholders (Mittal & Kumar, 2019). However, many knowledge-oriented KM models would require substantial resources and allied health professionals’ time to implement, which may be unsuitable for this study’s small/medium-sized hospitals.

### **Contingency models**

The success of KM systems typically depends on managers’ understanding of KM, their employees’ knowledge-seeking and sharing behaviours, and understanding of organisational learning. Therefore, contingency models of KM suggest that successful implementation depends on contextual considerations. One example of a model by Sanchez (2006) describes the two fundamentally different views of knowledge, taking either a personal or organisational knowledge approach. The personal knowledge approach exploits tacit knowledge, requiring management practices that encourage sharing ideas with colleagues. Alternatively, the organisational knowledge approach provides formal processes to create knowledge assets in documents, standard operating procedures and databases of best practices. Sanchez (2006) recommends that a hybrid combination of the two approaches should be contingent on organisation-specific goals. A

conceptual KM model by Bordoloi and Islam (2012) explores healthcare KM and information science research literature. They propose that networks of practice among healthcare professionals are essential for diffusing ‘best practice’ knowledge throughout organisations (Bordoloi & Islam, 2012). These social networks of practice are relevant to this research, as smaller hospitals may limit allied health professionals’ access to social networks due to organisational size constraints.

As discussed previously, researchers have proposed various organisational KM models to improve managers’ and practitioners’ understanding of cause and effect interactions relating to human resource development (HRD) and organisational learning. The substantial strength of many KM models is that they acknowledge both codified explicit knowledge and employees’ tacit knowledge and provide healthcare managers guidance regarding how best to exploit knowledge for the benefit of organisations and patients. For example, King’s (2009) process-oriented model, Fu and Lee’s (2005) social and technical enabler model, and Sanchez’s (2006) contingency model of KM, that each acknowledge the value of personally held knowledge. The robustness of many models that acknowledge the role of tacit knowledge in KM is their foundation on previous psychological research and an understanding of human motivation and social behaviour and its relationship to profession-related knowledge sharing in the workplace (Triandis, 1980). In addition, these models also recommend providing supportive leadership, helpful relationships, and reflective practice to allied health professionals.

A recent tertiary literature review by Cerchione et al. (2023) analysed and evaluated aggregated literature review data and explored the evolution of KM models. The review found that although enduring and contemporary ‘process-oriented’ models of KM continue to encompass acquisition, storage, and transfer of knowledge, they are however, now more focussed on knowledge creation and sharing. Their analysis suggests that a critical factor in the success of KM programs was that there needed to be support of informal social interactions among employees and encouragement of positive group dynamics.

The review by Cerchione et al. (2023) found that the most enduring ‘knowledge-oriented’ model was the SECI knowledge creation and transfer model by Nonaka and Takeuchi (1995). The SECI model was described previously in this subsection and diagrammatically in Figure 4, representing knowledge conversion processes between explicit and tacit organisational knowledge assets. Their model was based on seminal

notions of explicit and tacit knowledge described by Polanyi (1961), who conceptualised knowledge as an organisational asset. Furthermore, Cerchione et al. (2023) suggest that Nonaka and Konno (1998) also supported the need for enabling conditions for creating and sharing knowledge, but also introduced the notion that information technology could be enhance the processes of KM.

Unfortunately, the literature review from the study described in this thesis, found scant evidence of KM models' effectiveness. In addition, systematic literature reviews have also demonstrated that the KM research into healthcare focuses on 'tame' organisational problems at the expense of the more complex issues. For example, Rittel and Webber (1973) described 'wicked' problems as inherently more challenging to define and resolve (Hujala & Laihonon, 2021).

The weakness of many KM systems lies in their complexity, and the sometimes unforeseen effects on strategy and information management. Many KM models may also require large investments of employee time and capital resources that smaller organisations may not find feasible. Therefore these models may be unsuitable for small/medium-sized hospitals such as some of those explored in this study. Suboptimal outcomes from KM projects can also be derived from ill-considered corporate strategy, poorly devised KM processes and failing to gain the support of key knowledge-holding personnel (Mittal & Kumar, 2019). Cerchione et al. (2023) concluded that the work cultural implications of providing user-friendly and intuitive systems were vital to the success of KM models' implementation.

In summary, the success of KM systems in hospital settings usually depends on managers' understanding of KM models, how they affect their employees' knowledge-seeking and sharing behaviours, and their overall understanding of organisational learning. The best outcomes for KM programs require a well-considered corporate strategy, understanding existing sources of explicit and tacit knowledge, developing appropriate KM processes and recruiting the support of requisite personnel (Mittal & Kumar, 2019). For the study reported in the thesis, the researchers seek evidence of any particular KM model being utilised in participating hospitals. The semi-structured interviews also attempt to elicit whether hospitals focus on either organisational or personal KM approaches. In addition, the research explores whether the KM implemented by hospitals acknowledges the allied health professionals' expertise and hospitals' knowledge needs.



## **2.3 Adult Education**

The previous two sections of this chapter explore the sociological construct of professions (section 2.1) and the organisational factors of profession related KM (section 2.2). In addition, understanding CPD among allied health professionals requires reviewing the foundational literature regarding adult education. Setting the scene for adult learning in Australia, around 96% of 17-year-old children enrol in secondary schools, and 74% of 19-year-olds enrol in tertiary studies (OECD, 2017). The didactic methods of teaching still used today involve a teacher giving information to students in a classroom or lecture theatre, and this may be helpful in dissemination of explicit or propositional knowledge. However, standardised and didactic modes of education may not be the most effective for many CPD activities. Therefore, this section explores adult education and provides an overview of the theory and practice of adult learning. The literature reviewed embraces the stance that successful professional learning for healthcare practitioners requires drawing on the principles of adult learning theories. Therefore, this overview describes how the understanding of adult education has evolved. The following three subsections initially describe adult learning or andragogy (subsection 2.3.1) and a typology of adult learning (subsection 2.3.2). In addition, the final subsection will review social learning literature, including existentialism, social cognitive theory, and situated learning or learning from practice (subsection 2.3.3).

### **2.3.1 Adult learning - andragogy**

People are always learning, whether they are engaged in formal teaching programs or informal learning experiences. For example, informal learning may be achieved by observing others or working alongside colleagues in the workplace. The adult-learning concept of 'andragogy' (Knowles, 1968, 1980) recognises that adult education programs must align with adult needs, being 'learner-centred' and 'life-driven' (Bierema, 2019). Adults are typically able to engage in meaningful reflection, which allows for changing their attitudes and actions based on their belief in evidence and assessing the credibility of the source of any new information. However, this learning also occurs within social and professional contexts of working life and requires ongoing integration with an individual's past experiences. In addition, adults construct their professional knowledge by being responsive to their working environment's culture and the behaviours in their community of practice (Goller & Billett, 2014).

In summary, the literature suggests that people are always learning, even from on-the-job experiences. Andragogy theory tells us that adults can also engage in meaningful reflective practice, incorporating new evidence from credible sources. In addition, adult learning theory proposes that learners are not just passive participants but also active agents in their professional learning (Bandura, 2001). Therefore, CPD can address identified knowledge deficits but may also develop an individual's future potential. Furthermore, Jarvis (2004) suggests that learning is 'existential' in nature and a life-long endeavour for all people. Thus, understanding the nature and motivations of adult learners regarding their profession related learning is essential for the research study described in this thesis (see Chapters 4, 5 & 6).

### **2.3.2 Typology of adult learning**

Adult learning research began in the 1920s, although there is still no unified consensus regarding adult learning theories (Bierema, 2019). Some early research produced a typology of motivations for adult learning. Therefore, people were allocated classifications of goal-oriented, through using education to accomplish an objective; activity-oriented, through participating for reasons not connected to the activity; or learning-oriented, seeking knowledge for its own sake (Houle, 1961). However, a later critique of the typology developed by Houle (1961) suggests that the descriptive motivations to undertake adult education did not anticipate the complexity of motives and lacked predictive capability (Boshier & Collins, 1985; Wlodkowski & Ginsberg, 2017). For example, in research among physiotherapists, motivations to undertake CPD included compliance with professional registration requirements, improved patient care, intellectual challenge, peer approval, fear of litigation, career prospects and reduced job stress (Dowds & French, 2008).

### **2.3.3 Social learning**

In Western societies, traditional education emphasises individual learning of theoretical or propositional knowledge, which is assumed to form the foundation for professional competence. In contrast, contemporary humanistic perspectives of existential learning require more self-development, self-reflection and personally meaningful experiences to be effective (Rumianowska, 2020). The social learning theory by Bandura (1971) was an early example of this perspective, suggesting that knowledge develops from experience in communities of practice, reinforced through social interactions. Wenger-Trayner and Wenger-Trayner (2015) also contend that learning is most useful when derived from

active social engagement in the workplace. Therefore, social learning approaches acknowledge the role of imitating the behaviour of others and considering the thoughts of the individual actors. Furthermore, social learning theories can help explain human behaviour by recognising the mediating factors involved in learning. An overview of the pertinent social learning theories of existentialism, social cognitive theory and situated learning follows.

### **Existentialism**

The philosophy of existentialism originated in Europe during the 19<sup>th</sup> and 20<sup>th</sup> centuries. Definitions of existentialism are often broad in their scope; with one contemporary author proposing the following definition:

A special position in thought regarding education is occupied by existentialism, which can be described as a theory of human development, a philosophy of being, philosophy of existence or life (Rumianowska, 2020, p. 262).

The philosophers that are central to existentialist thinking include Soren Kierkegaard (1813-1855); Friedrich Nietzsche (1844-1900); Martin Heidegger (1889-1976); and Paulo Freire (1921-1997). Heidegger (1962) greatly influenced modern thought and expressed ideas on the critical existentialist concerns of ‘existence’, ‘anxiety’ and ‘the crowd’. The recurring theme of existence acknowledges heterogeneity in the human condition, while the crowd theme expresses a social and political dimension that influences contemporary education and learning. In addition, existentialism often refers to ‘situatedness’, correlating personal worldviews and circumstances to historical and social contexts (DeRobertis, 2017). Collectively, existentialist themes emphasise a holistic view of each person’s environment, interpersonal social life, and subjective perceptions of education and profession related learning discussions. In addition, the term ‘becoming’ is also used by DeRobertis (2017) and describes how learning becomes an integral part of an ever-changing human being. This usage of becoming is similar to the human need for ‘self-actualisation’ described earlier by Maslow (1943) and the ‘growth’ Alderfer (1972) describes in his Existence, Relatedness, Growth (ERG) theory of motivation. These motivation theories consider developing an individual’s full potential as a human need of the highest order, only satisfied by continually increasing workplace competence through self-improvement and CPD.

## **Social Cognitive Theory**

Evolving from an earlier social learning theory, Social Cognitive Theory (SCT) has contributed significantly to education theory (Bandura, 1986b). Similarities with existentialism are evident, with SCT describing human learning as dynamic, with reciprocal interactions between the individual, the environmental context and human behaviour. For example, individuals' past experiences and social influences contribute to their behaviour. In addition, SCT draws attention to the collaborative approach among professional colleagues, with purposive grouping enabling observational learning. For example, a person can learn by witnessing the behaviour of others and observing the consequences. Thus, learning from the successes and mistakes of others and then 'modelling' successful behaviours by adopting "conceptual schemes that can offer better explanations and solutions" (Bandura, 2005, p. 10). Therefore, social learning enables co-constructed knowledge, facilitating a more holistic, context-based understanding of evidence-based practice (Hughes et al., 2019).

SCT proposes that people involved in social learning are not merely passive participants in the learning process but can exert power and intentionality to achieve their goals. Bandura (2001) accepts that learners exercise agency, with their actions governed by intention, forethought, self-reflection and subjective meaning. However, the agency that participants exert in the processes of social learning has differing modes of influence:

In these agentic transactions, people are producers as well as products of social systems. Social cognitive theory distinguishes among three modes of agency: direct personal agency, proxy agency that relies on others to act on one's behalf to secure desired outcomes, and collective agency exercised through socially coordinative and interdependent effort (Bandura, 2001, p. 1).

Cognitive factors allow some people to successfully navigate a complex social world with all its challenges; making informed judgments about their capabilities, anticipating the effects of different actions, evaluating opportunities and barriers, and governing their responses (Bandura, 2001). As a result, individuals will behave in ways they believe will produce positive outcomes and avoid adverse consequences. In addition, people will also undertake actions that give them personal satisfaction and an improved feeling of self-worth. The strongest motivations will come from self-development and professional development activities with challenging short, medium or long-term goals (Bandura, 2001).

An individual's beliefs in their capacity to exert control over themselves and their environment are also essential for the success of human agency (Bandura, 2001). In contrast, if people do not believe they can produce their desired outcomes, they have little motivation to continue their particular behaviour. These self-efficacy beliefs may result in unwarranted pessimism or optimism and hinder or enhance efforts at self-development, respectively. However, Bandura (2001) believes that employees should take control of their professional development and "cultivate multiple competencies to meet the ever-changing occupational demands and roles for a variety of positions and careers over the full course of their worklife" (p. 11). Therefore, although an individual's perception of self may be partially socially constructed, exercising agency makes it possible to exert influence over the environment and allow the proactive re-shaping of professional life.

### **Situated learning (Learning from Practice)**

Regardless of geographical region or cultural effects, learning from practice has historically been the most common learning method for many occupations. Another form of social learning is 'situated learning', in which knowledge and skills are acquired in the workplace and affect how knowledge and skills are understood. The search to be more productive with labour and capital resulted in the first industrial revolution in Britain between 1750 and 1850 (Mokyr, 2018). However, the industrial revolution was disruptive to the labour force as the balance shifted from focusing on personal knowledge and skills to increasing mechanisation in factory settings. Nevertheless, for many occupations, learning from practice is still a necessary part of work-related education and "the majority of that learning seems based on mimesis: observation and imitation, then practise (i.e. rehearsal)" (Billett, 2014, p. 676). Therefore, knowledge constructed in real workplaces may lead to a more authentic understanding and a more comprehensive integration of new knowledge and skills for professional practice.

In summary, this thesis section has reviewed social learning related to CPD. In contrast to traditional education systems of Western societies, humanistic learning perspectives suggest that more self-reflection and meaningful, practical experiences are necessary for learning to be effective. Knowledge from on-the-job training is now considered more authentic and comprehensive for healthcare professionals. Therefore, social learning theories provide a more holistic, context-based understanding of professional practice and can be a valuable guide for effective CPD programs. Aspects of social learning are central to the study described in this thesis. For example, the study will question: whether allied

health professionals have a strategic approach to CPD; whether their everyday practice is challenging; and whether they are afforded the opportunity to work alongside experts.

## **2.4 Continuing Professional Development (CPD)**

Historically, continuing education (CE) through didactic teaching has been the primary model of post-qualification learning in many professions worldwide (Micallef & Kayyali, 2019). However, the processes of ongoing continuing professional development (CPD) provide a shift towards learner-focused, self-reflective models of learning. One definition of CPD from the literature is widely adopted and succinct:

The maintenance and enhancement of knowledge, expertise and competence of professionals throughout their careers to a plan formulated with regard to the needs of the professional, the employer, the profession and society (Madden & Mitchell, 1993, p. 3).

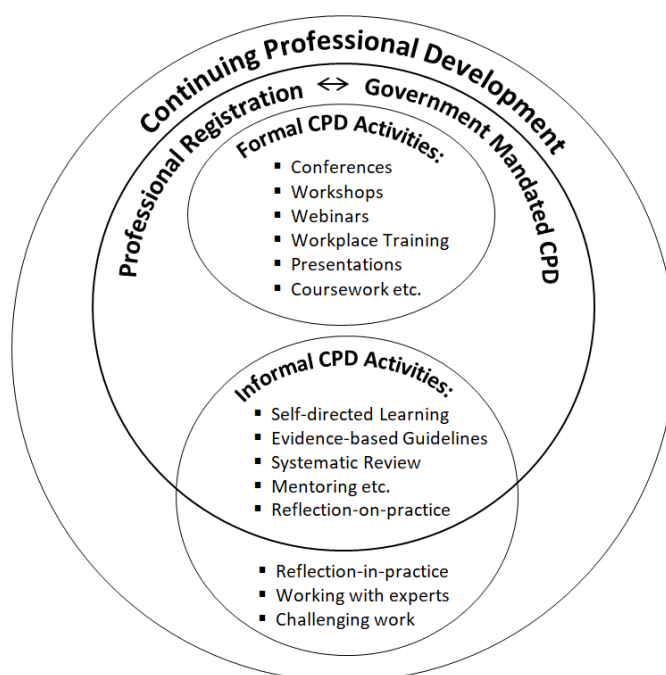
In contrast, another definition of CPD relates more explicitly to healthcare professions; therefore, it is a better fit for purpose than other more general definitions and suitable for this research project:

CPD refers to an array of educational activities that health professionals undertake to maintain, develop, and enhance the knowledge, skills, professional performance, and relationships they use to provide care for patients, the public, and the profession. CPD ... addresses not only the clinical domain, but also additional professional practice competencies (e.g. communication, collaboration, professional); and emphasizes self-directed lifelong learning and learning from practice (Sargeant et al., 2011, p. 167).

Comprehensive definitions of CPD encompass all learning related to the successful undertaking of each profession, including the formal and informal CPD activities required to meet professional registration requirements. In addition, it also includes activities that contribute to knowledge and expertise drawn from workplace practice. Being mindful of these definitions and the criteria they contain, a conceptual framework of CPD in allied health professions is proffered, as depicted in Figure 5.

**Figure 5**

*Conceptual Framework of CPD in Allied Health*



Note: The conceptual framework diagram portrays a Venn diagram of the relationships between various components of CPD. In addition, the diagram demonstrates overlapping sets, with the outermost set (Continuing Professional Development) representing the comprehensive and inclusive definition of CPD adopted for this study. That definition encompasses all profession related learning, including formal and informal CPD activities and on-the-job activities that contribute knowledge and expertise.

The Australian Government requires allied health professionals to undertake a minimum number of CPD hours in prescribed time frames to maintain registration to practice. Therefore, the next sizeable set in the diagram (Professional Registration – Government-Mandated CPD) includes all formal and informal learning activities eligible for inclusion in CPD programs for professional registration.

Finally, the remaining two centrally placed sets in the diagram represent formal and informal CPD activities, respectively. The uppermost of these two sets (Formal CPD Activities) represents the formal learning activities that are relatively easy to document and submit for professional registration purposes, due to the certificates of attendance that are typically provided to attendees. However, programs of CPD may combine learning from formal and informal activities (Dall’Alba & Sandberg, 2006). Therefore, the lowermost of these two sets (Informal CPD Activities) represents informal learning, some eligible for documented CPD programs, but many valuable learning opportunities remain outside mandatory CPD prerequisites. In addition, many of these informal activities

contribute substantially to profession related skills, including reflection-in-practice; working with expert colleagues; and undertaking challenging work.

Although CPD is considered an implied social responsibility for allied health professionals, governments and professional associations are increasingly concerned with demonstrating currency with best practice (Billett & Hodge, 2016; Webster-Wright, 2009; Wenger-Trayner & Wenger-Trayner, 2015). As a result, Australian government regulations include mandatory CPD requirements for allied health professionals' registration. Current mandatory CPD input requirements for the allied health professions participating in this study are listed in Table 2.

**Table 2**

*Mandatory CPD for Registration in Australia*

<b>Profession</b>	<b>CPD In-put</b>	<b>Time-frame</b>	<b>Governing Body</b>
Radiography	60 hours*	3 years	MRPBA
Sonography	60 hours	3 years	ASAR
Physiotherapy	20 hours	1 year	PBA

*Note:* \*Radiographers must complete mandatory hours over a 3-year triennium, with 10 hour minimum per year. A minimum of 35 hours must be substantive learning activities with significant intellectual or practical content relevant to current or emerging practice (ASAR, 2022; MRPBA, 2022; PBA, 2022).

Many Australian allied health professions also prescribe combinations of formal and informal activities to ensure diversity in learning experiences, while requiring CPD to be relevant to their scope of practice (ASAR, 2022; MRPBA, 2022; PBA, 2022). Although there are minimum mandatory CPD inputs for allied health professionals, their choices of CPD activities are largely discretionary.

Research regarding the reasons allied health professionals are motivated to undertake CPD activities found combinations of: professional registration and hospital accreditation requirements; progression towards evidence-based practice; professional advancement; and development of a specialist status (Murphy & Calway, 2007; Pool et al., 2016; Stagnitti et al., 2005). In contrast, deterrents to participation in CPD include: disengagement; lack of good quality CPD; family constraints; cost of CPD activities; perceived lack of benefit; and work-related limitations (Chau et al., 2012; Scanlon & Darkenwald, 1984). In addition, allied health professionals working in regional areas also suffer increased costs and inconvenience, with many CPD activities being inaccessible due to the distance from their workplace or home (AIHW, 2014; Stagnitti et al., 2005).



Therefore, they will judge the combination of personal motivations and deterrents they perceive as relevant to CPD and which activities to include in their learning program.

In summary, contemporary CPD is shifting towards learner-focused, self-reflective learning models. Among the various definitions of CPD in the literature, the idea of maintaining and enhancing profession related knowledge and expertise is common. However, some definitions cling to sociological constructs, including the ‘noble work ethic’ (Popkewitz, 1994) and meeting employers, professions, and societies’ needs (Madden & Mitchell, 1993). In contrast, a more contemporary definition of CPD from the literature seemed more befitting allied health professions, and the research described later in this thesis. The more apt definition includes maintaining and enhancing profession related knowledge and expertise but adding profession related soft competencies and emphasising the need for “self-directed lifelong learning and learning from practice” (Sargeant et al., 2011, p. 167). Therefore, comprehensive definitions of CPD encompass all profession related learning, including the formal and informal CPD activities, including learning from everyday workplace practice.

The author’s conceptual framework of CPD in allied health professions, is depicted Figure 5 as a diagram. The framework’s most notable feature is that the lowermost of the two small centrally located sets (Informal CPD Activities) represents informal learning, some of which remains outside mandatory CPD prerequisites but contributes substantially to profession related knowledge and skills. In addition, although there are mandatory CPD inputs for professional registration, allied health professionals’ choices are still mostly at their discretion.

This research explores the CPD of allied health professionals working in regional Victorian public hospitals and considers the social aspects required to encourage and facilitate profession related learning. This section of the literature review will provide much of the background for the primary research question:

- What factors significantly influence the availability and effectiveness of continuing professional development (CPD) of allied health professionals (radiographers, sonographers and physiotherapists) in regional Victorian public hospitals?

The following eleven subsections explore various learning theories including learning-action theories; lifelong learning; self-directed learning; and reflective practice (subsections 2.4.1 - 2.4.4). In addition, the subsections will review theoretical models of

continuing education (CE) and CPD; CPD activities in allied health; and communities of practice (CoPs) (subsections 2.4.5 - 2.4.7). Furthermore, the subsections will explore the professional expertise related to CPD and the application of professional competency frameworks (subsections 2.4.8 - 2.4.9). Finally, the remaining subsections review the need for CPD planning and effectiveness measures (subsections 2.4.10 - 2.4.11).

### **2.4.1 Learning-action theories**

Individual allied health professionals' profession related learning being at their discretion means they can exert agency, ultimately affecting the outcomes of their CPD activity choices. Poell and Van Der Krogt (2016) describe their 'learning-action theory', which suggests that employees can modify their professional development over time as they learn to apply personal values to their CPD decisions. These researchers have identified four value groups that serve as motivation for professional development. The value groups include: profession-driven learning based on professional identity; person-driven learning based on personal qualities; work-driven learning as a consequence of perceived obligations; and socially-driven learning based on seeking social acceptance (Poell & Van Der Krogt, 2016). Within learning-action theory, employees progressively learn how to organise their professional development, becoming more aware of other working colleagues who support their learning efforts. In addition, they also acknowledge that different people have individual career pathways, and a primary focus on patient care is the critical common goal among healthcare practitioners (Micallef & Kayyali, 2019).

In summary, allied health professionals' CPD being discretionary means these individuals can exert agency on their CPD programs. 'Learning-action theory' (Poell & Van Der Krogt, 2016) suggests that allied health professionals can progressively modify their CPD by applying their values to motivate CPD choices. Furthermore, this theory suggests that people gravitate towards others who support their learning.

### **2.4.2 Lifelong learning**

The definitions of CPD mentioned previously propose either a career-long or lifelong commitment to profession related learning. However, with eligibility for an age pension for many Australians now being 67 years, means there may be a growing need for many people to be employable for longer (Australian Government, 2019). In addition to potential career longevity, the pace of change in professional disciplines requires updating knowledge to maintain currency with contemporary best-practice. Furthermore, many socio-economic imperatives have affected 'lifelong learning' notions, including the

increasing importance of a knowledge-based economy and employers' increasing workforce expectations (Bollington, 2015; OECD, 2007).

As mentioned previously, lifelong education was historically associated with educational institutions and was often limited to formal didactic educational experiences at universities, conferences or workplaces. The era in which adult education facilitated workplace learning has given way to a more comprehensive view of learning that includes all purposeful learning activities. Billett (2018) describes access to educational programs and learning opportunities that an organisation has provided its employees as 'affordances' or 'invitations to change'. However, formal educational activities only contribute to learning sporadically throughout working life. The affordances from employers described by Billett (2018) can also include accessing complex and challenging practice and working alongside peers or mentors. These informal learning activities provide an opportunity for learning from everyday practice.

From the perspective of professional organisations such as hospitals, there is a need to maintain employees' best-practice capabilities, which requires understanding adult learning principles. It also needs to be understood that moment-by-moment on-the-job learning or 'microgenetic development' contributes significantly to an individual's personal and professional development (Arievitch, 2017). However, the learners are not passive recipients of knowledge, with learning being mediated by how they perceive the experience of any learning opportunity (Avby, 2016; Bandura, 2001, 2005; Billett & Hodge, 2016). Therefore, how individuals 'construe and construct' what they experience will determine the take-home message from learning experiences (Billett, 2018). In contrast to lifelong education, lifelong learning is derived from any learning opportunity, including professional practice. In addition, the current consensus of lifelong learning includes all purposeful learning activities, formal or informal, improving learners' knowledge, skills, and attributes. Therefore, the contemporary concept of lifelong learning is imperative in a healthcare environment of rapid change, with results benefiting from being proactive and keeping up-to-date with best-practice knowledge.

In summary, previously cited definitions of CPD propose a lifelong commitment to profession related learning. Typical formal education occur infrequently throughout a person's working life; however, employers have the opportunity to facilitate ongoing on-the-job workplace learning (Billett, 2018). These informal CPD activities can contribute

substantially to profession related learning, and hospitals should ensure that allied health professionals can access everyday learning.

### **2.4.3 Self-directed learning**

The allied health professionals participating in this study have discretion in selecting CPD activities and exerting agency within CPD programs, thus affecting overall learning outcomes. This subsection provides an overview of self-directed learning (SDL). SDL involves adult learners taking the initiative in defining and executing their own learning needs, deciding which knowledge or skills they believe they need most and then proactively seeking them out.

Understanding the knowledge necessary for practice through reflection is a crucial component of SDL. Recent research found that self-reflection may facilitate meeting learners' personal goals while also fulfilling societal expectations (Morris, 2019; Tan, 2017). An early definition of SDL acknowledges that processes that may also involve other people:

In its broadest meaning, "self-directed learning" describes a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes (Knowles, 1975, p. 18).

However, finding adequate knowledge may not happen in a timely fashion and that scenario may require experimentation with the unknown:

Importantly, the learner may deem, or choose, that no established knowledge or skill is fully fitting to his or her inquiry project. In such a case, the learner could attempt to be creative to design novel knowledge or skill that may be more appropriate (Morris, 2019, p. 62).

A spectrum of personal motivations for adult learners who undertake SDL represents individually meaningful needs, values and interests, with motivations including attempts to improve job satisfaction or work/life balance (Morris, 2019; Rigby & Ryan, 2018). Although learners' personality traits may also influence their inclination to undertake SDL, there is a correlation between self-directedness and a perceived need to adapt to change (Kirwan et al., 2014; Morris, 2019). The advantages of SDL include: avoiding the obsolescence of knowledge, skills and attributes; allowing upskilling; and providing a degree of protection against a changing workplace (Morris, 2019). In addition, the

adaptive potential derived from SDL makes it indispensable for positively affecting long-term career success (Ward et al., 2018).

Contemporary workplaces have the opportunity to provide employees with access to SDL opportunities through Internet-based technologies. The rapid evolution of ICT has led to Web 2.0 technology, including Internet search engines such as Microsoft Edge™, Google Chrome™, social-network communities such as Facebook™ and video sharing via YouTube™ (Caruso, 2018). Research conducted with healthcare professionals (including doctors, nurses, pharmacists & social workers) found that digital and mobile technologies were critical in supporting their SDL (Curran et al., 2019). However, some research respondents are uncomfortable using social media for professional learning, citing a lack of credibility or evidence-base (Curran et al., 2019; Davis et al., 2015; Herron, 2015).

Continuous changes in the knowledge, skills, and attitudes underpinning healthcare suggest that it is vital for hospitals to encourage and support SDL for healthcare professionals (Kläser, 2018). For people working in regional or rural communities, the lack of access to good quality Internet services is a potential barrier to using Web 2.0 and mobile technologies. However, where reliable access is available, these technologies can support SDL and CPD (Curran et al., 2019). Therefore, restrictive hospital policies that limit Internet access or mobile devices during working hours may hinder opportunities for SDL that would otherwise enhance patient care.

In summary, allied health professionals have discretion in selecting their CPD activities and exerting agency that affects learning outcomes. SDL involves learners proactively managing and executing their CPD programs, deciding which knowledge or skills they need through reflective practice and recruiting the help of other people when needed. Successful SDL abates knowledge and skills becoming obsolete but can also be used to upskill for a desired future practice specialisation, thus providing protection against a changing workplace environment and improving long-term career success. Therefore, contemporary workplaces should encourage and support SDL in rapidly changing knowledge and skills environments, such as healthcare (Kläser, 2018).

#### **2.4.4 Reflective practice**

Reflective practice is integral to SDL, but unconscious and conscious reflections in healthcare almost certainly predate the appearance of the phrase ‘reflective practice’ in the literature. Human nature would not allow reacting entirely without emotion when

encountering people in distressing situations without at least wondering about the event at a later time (Eaton, 2016). The concept of reflective practice emerged in the literature in the 1980s and was later defined as a “learning and development process that includes the self-examination of one’s professional practice, including experiences, thoughts, emotions, actions and knowledge that enrich it” (Dubé & Ducharme, 2015, p. 91).

Effective reflective practice is essential in professions where evidence-based practice and client-centred care are crucial. Reflection allows professionals to connect current observations and past experiences and use informed judgment in clinical decision-making (Plack & Greenberg, 2005). In addition, as mentioned previously, the reflection can occur at both an unconscious and conscious level, with Mezirow (1991) proposing that reflection can occur at different levels of intensity, including habitual action, thoughtful action/understanding, or critical reflection. Applying deliberate critical reflection promotes more in-depth learning, encouraging re-evaluation of clinical encounters and personally held assumptions (McDermott et al., 2018; Plack & Greenberg, 2005).

Over time numerous theoretical models of reflective practice have been developed by authors from different disciplines. The most popular reflective practice models have often had common themes; however, they exhibit differences in nomenclature and the number of stages included in the models. For example, Kolb's Experiential Learning Cycle (1984, 2015) was based on human cognition and learning, focusing on developing understanding through practice experiences. It included four stages: concrete experience, reflective observation, abstract observation, and conceptualisation and active experimentation.

Similarly, Gibbs’ Reflective Cycle (Gibbs, 1988) attempts to provide a structural framework for reflective practice. His proposed framework allows for examining either novel or repetitive experiences that facilitate learning from positive or negative outcomes. This is one of the more complex models of reflection, having six stages comprising description, feelings, evaluation, analysis, conclusion and action plan. The conclusion stage defines learning from the experience, and the action plan suggests alternatives that may achieve more appropriate outcomes in similar contexts and circumstances. Gibbs' Reflective Cycle is an enduring model of reflective practice with continuing applications in teaching and allied health.

Another example of a reflective practice model developed within health care and incorporating lessons is the ERA reflective cycle of Jasper (2003, 2013). By exploring previous models, this new conceptualisation provides one of the simplest models of

reflection, involving only three reflective practice cycle stages: experience, reflection, and action. The model suggests that the end result of reflection on experience will differ for each individual and that each action will result in more experiences, initiating further reflective cycles.

Reflection can occur during or after facing a unique or ambiguous problem in the clinical setting. Describing different types of reflection, Schön (1991) distinguishes between ‘reflection-in-action’ and ‘reflection-on-action’. Reflection-in-action requires intuitive knowledge applied during practice by drawing on a repertoire of examples from experience and mentally creating new scenarios to meet the current circumstances (Börjesson et al., 2015; Schön, 1991). In addition, in responding to ‘wicked problems’ that are difficult to solve because of incomplete or ambiguous information, it may be necessary to perform ‘on-the-spot experimentation’ or modify practice (Eaton, 2016; Plack & Greenberg, 2005). In contrast, ‘reflection-on-action’ allows professionals to review or figuratively look back at their work and make sense of it, analysing the events and outcomes to enhance future patient care (Eaton, 2016; Plack & Greenberg, 2005).

Allied health professional associations generally encourage members to adopt deliberative reflective practice in their CPD programs so that practitioners might maintain and enhance their knowledge, skills and professional attributes. For example, the MRPBA (2020) refers to ‘evidence-informed’ practitioners in radiography. In addition, they detail radiographers’ responsibility to be critically aware of their actions through reflection and suggest developing the capability to resolve challenges through critical thinking. Similarly, the ASAR (2022) expects sonographers to reflect on how CPD learning activities may change or reinforce current clinical practice or impact their ongoing education. Finally, the PBA (2015) considers reflective practice for physiotherapists essential for professional competence. Therefore, reflection for CPD activities can include information sharing at in-service clinical meetings and informal discussions with work colleagues. As part of life-long learning and professional development, reflective practice encourages allied health professionals to recognise knowledge gaps and plan their own learning needs (Plack & Greenberg, 2005).

Allied health professionals may learn from personal experience; however, by reflecting on observed workplace occurrences, it is also possible to learn vicariously from other people’s mistakes and successes (Koshy et al., 2017). Much of reflective practice revolves around near misses and medical errors in real-world settings. In those instances, it is

crucial to explore whether changes in practice would improve healthcare outcomes for future patients. In contrast, reflecting on good practice may also be rewarding as it can build confidence regarding current practice (Koshy et al., 2017).

Research shows that reflection in small informal groups is preferable in some contexts and that more relaxed settings may stimulate reflective conversations with colleagues (McDermott et al., 2018). Group reflective practice allows ‘multi-layered reflectivity’, developing collective knowledge and improving healthcare quality (Börjesson et al., 2015). The importance of social groups in the learning process usually benefits practice:

Interaction between an individual and the environment takes place continually, forming the basis for the learning process. Thus, an action takes place in a context primarily determined by others through rules, values, attitudes and expectations. This practical and social basis for learning is in direct opposition to a traditional view of a separate and – from the practical context – isolated individual as the centre of the learning process (Svensson et al., 2004, p. 479).

For example, research conducted in a hospital trauma centre discovered that healthcare professionals found that deliberative reflection involving discussion and evaluation as a group benefits future treatments (McDermott et al., 2018). However, collective reflective learning efforts are not always positive experiences, with some hospitals blamed for undermining collegiality and informal knowledge sharing (Börjesson et al., 2015). In addition, some organisational cultures or sub-cultures may actively discourage reflection due to concerns that perceptions of competence may be diminished by admitting mistakes. However, the willingness to acknowledge gaps in profession related knowledge is considered a crucial component of reflective practice (McDermott et al., 2018).

Reflection also extends to contemplating professional identity and the more abstract constructs of professionalism (Plack & Greenberg, 2005). Therefore, self-reflection is essential for allied health professionals’ technical knowledge and skills, but individual needs also exist alongside collective needs in each profession.

In summary, reflective practice is an integral part of SDL, with literature defining it as self-examining professional practice experiences, thoughts and emotions. Effective reflective practice is beneficial in evidence-based professions, and it informs clinical decision-making based on past experiences. In addition, reflection can occur subconsciously or consciously; deliberate critical reflection leads to a more in-depth understanding and challenges previously held assumptions. Therefore, different types of reflection coexist; ‘reflection-in-action’ uses intuitive knowledge drawn from a repertoire of examples from experience and then tailored to meet the current circumstances (Schön,



1991). In contrast, ‘reflection-on-action’ allow allied health professionals to review their work with hindsight and analyse the outcomes to refine future practice (Eaton, 2016).

The allied health professions participating in this research encourage reflective practice, life-long learning, and CPD, encouraging allied health professionals to plan their learning needs proactively. Learning from personal experience is well and good; however, by observing others’ work allows vicarious learning from other people’s mistakes and successes. Furthermore, reflective practice in small informal groups may stimulate colleagues’ conversations and facilitate social learning and collective professional knowledge. The research described later in this thesis will explore the role of reflective practice in the CPD programs of the participants.

#### **2.4.5 Models of continuing education and CPD**

The reflective practice discussed in the previous subsection is often a precursor to developing an individual’s CPD program. The following section provides an overview of continuing education (CE) and CPD models, many of which draw on iterative representations to depict the activities involved. Research in Vocational Education and Training (VET) has identified four continuing education models (Billett et al., 2014). These include supported work-based experiences in day-to-day work; unassisted work-based experiences; work-based experiences with educational interventions involving expert classroom-taught theory; and wholly academic institution-based education. The research found that to maintain practice currency, managers and employees prefer using practice-based models of CE and CPD (Billett et al., 2014); the advantages being “because the context and activity comprise the authentic deployment and enactment of what is learned” (Choy et al., 2016, p. 227). In addition, the benefit of workplace activities is that they commonly reflect the attributes of adult learning, including peer engagement and deliberative goal-directed learning (Horn et al., 2019).

Although managers prefer employer-sponsored training, employees choose not to rely solely on workplace education but instead control their learning by seeking co-workers’ support when needed (Billett et al., 2014). In addition, Billett and Hodge (2016) reported a preference by managers to have employees participate in training that might help develop pre-specified competencies that benefit the organisation. In contrast, employees often wish to learn knowledge and skills aligned with their interests and goals.

One CPD model by Moore Jr et al. (2009) focused on changing practice at organisational and practitioner levels in the healthcare sector. The underlying study identified five individual and intuitive learning steps: recognising learning opportunities; searching for resources; engaging in learning; trialling learning; and then incorporating learning into practice. A further healthcare CPD model proposed a seven-step method for translating knowledge into practice (Graham et al., 2006), identifying variables that influence planned actions and affect individual behaviour. The seven steps in the knowledge-to-action (KTA) cycle include: identifying a problem; adapting knowledge to the local context; assessing any barriers to knowledge use; selecting, tailoring and implementing interventions; monitoring knowledge use; evaluating outcomes; and then sustaining knowledge use (Graham et al., 2006; Sargeant et al., 2011).

In summary, research in the VET sector found that managers and employees prefer using practice-based models of CPD because of the authenticity of context and work activities (Billett et al., 2014; Choy et al., 2016). However, employees preferred to control their learning and learn knowledge and skills aligned with their goals. Different CPD models have been explored, but they focus on changing organisational and practitioner practice, with the underlying studies identifying various stages of stepwise learning.

Twenty-first-century employees need to be strategic when responsible for their professional development, acquiring the competencies that will enable them to advance throughout their careers (Poell & Van Der Krogt, 2016). Employees must also interact with others involved in their CPD, such as government bodies, managers, work colleagues, and clients with vested interests. The research study presented in this thesis explores whether allied health professionals strategically use CPD to enhance knowledge and skills to benefit their current practice or enable career progression.

#### **2.4.6 CPD activities in allied health**

Whether CPD programs are based on any particular model of CPD or are ad hoc, allied health professionals are required to undertake CPD activities. Australian government bodies and allied health professional associations consider both formal and informal learning as legitimate for meeting CPD requirements for professional registration (ASAR, 2022; MRPBA, 2022; PBA, 2022). Formal CPD activities can be satisfied through conferences, meetings and workshops, and informal activities, including research, reading journals, mentoring, and involvement with learning networks (Allen et al., 2019; Horn et al., 2019). In addition, the contribution of work structure is central to improving

professionals' expertise, achieved through challenging practice or learning alongside more experienced professionals. However, well-structured day-to-day work lacks government and professional associations' recognition as part of mandatory CPD requirements (Benner, 2004; Dreyfus et al., 1986; Eraut, 2007, 2011).

This under-appreciation of the contribution of informal learning by healthcare regulators ignores the estimated 70-90 per cent of professional learning that results from this sub-set of informal work (Eraut, 2011). Collaboration with other more expert professionals facilitates vicarious experience, compounding understanding from experience and learning from the mistakes of others (Allen et al., 2019; Bandura, 1986a; DeTormes Eby et al., 2014). Despite the value of collaboration, hospital size may contribute to whether workplace learning alongside more experienced professionals is available for regional allied health professionals.

As described in previous research, allied health professionals have a preference for formal face-to-face CPD activities (Allen et al., 2019; Benwell & Fowler, 2017), but access is frustrated in regional locations due to their limited availability (Edward et al., 2019; Horn et al., 2019; Stagnitti et al., 2005). Nevertheless, the potential to increase uptake in CPD activity in regional contexts by accessing online material is underutilised, with limited levels of participation identified in web-based and computer-assisted CPD (Mathur et al., 2005; Micallef & Kayyali, 2019; Sandars et al., 2007). However, research on the feasibility of social media as a platform for CPD found that while there are inherent privacy risks, social media provides new networking opportunities (Lawson & Cowling, 2015; Palonen & Hakkarainen, 2014).

In summary, both formal and informal CPD activities are legitimate for meeting professional registration requirements for allied health professionals. However, the structure of everyday work is central to improving professionals' expertise. The benefits from day-to-day practice may be optimised by participating in challenging practice and vicarious learning alongside more expert professionals. However, well-structured working environments are under-appreciated for contributing to effective profession related learning. Knowing the value of challenging practice and vicarious learning, the research project detailed later in this thesis explores the effects of hospital size on whether these opportunities are available for regional allied health professionals. In addition, this study will explore whether access to CPD activities is frustrated in regional locations.

### **2.4.7 Communities of practice**

In addition to formal CPD activities, further profession related learning opportunities may be available through emergent 'community of practice' (CoP) groups (Wenger, 1990). CoPs have their “roots in attempts to develop accounts of the social nature of human learning inspired by anthropology and social theory” (Wenger, 2010, p. 179). Although the literature lacks a consensus definition of CoP, it typically describes a group with a common interest in increasing their knowledge and expertise through ongoing interaction (Agrawal & Joshi, 2011; Wenger-Trayner & Wenger-Trayner, 2015). Earlier definitions of CoPs suggested they were often informally formed, with membership emerging rather than created for a task (Brown & Duguid, 1991; Nonaka, 1994; Wenger, 1990). Therefore, the informal nature of CoPs means that community members volunteer their time and effort on a discretionary basis.

The composition of CoPs often includes a range of individuals; experts, novices and some in transition between these levels of expertise. The concept of ‘legitimate peripheral participation’ is crucial to a functioning CoP (Lave & Wenger, 1991). It describes a hierarchy of membership with experts most centrally located within the community and novices more peripherally positioned, their relative metaphorical position changing with increasing experience. However, CoP theory suggests that knowledge acquisition and knowledge flows from the practice and collective actions of individuals but may “amount to more than the sum of those actions” (Duguid, 2005, p. 115). Therefore the benefits of CoPs extend beyond the initial workplace induction and dialogue with colleagues about professional practice; they also reduce feelings of isolation (Wilson et al., 2017). In addition, CoPs have been found to increase empowerment and self-advocacy (Barbour et al., 2018; Henwood et al., 2017).

To aid the identification of CoPs in real-world situations, Wenger (1998) proposes a list of ‘indicators’ for detecting a CoP in a social or organisational setting, listed in Table 3. The indicators describe mutual engagement, whereby group members build community and practice; joint enterprise; collective negotiation of meanings; and a shared repertoire of routines, symbols, and actions (Wenger, 1998). The literature describes two structural forms of CoP. Firstly, stratified CoPs, where the community differentiates between novice, intermediate and experts with permitted activities dependent on hierarchical standing; secondly, an egalitarian form, where the community tends to accord all members fair and equal participation (Klein et al., 2005).

**Table 3**

*Key characteristics of a community of practice*

- Shared engagement in doing things together
- The rapid information flow and propagation of innovation
- Conversations and interactions that merely continue an ongoing process
- Speedy setup of a problem to be discussed
- A substantial overlap in participants' descriptions of who belongs
- Knowing what others know, what they can do, and how they can contribute
- Mutually defining identities
- The ability to assess the appropriateness of actions and products
- Specific tools, representations, and other artefacts
- Local lore, shared stories, and inside jokes
- Jargon and shortcuts to communication
- Particular styles recognised as displaying membership
- A shared discourse reflecting a particular perspective on the world
- Sustained mutual relationships (harmonious or conflictual)

*Note:* Wenger (1998, pp. 125-126)

Regardless of the structural form of CoPs they usually provide less experienced members with access to the explicit and tacit knowledge held by the community. In addition, they are enhancing individuals' learning from knowledge sharing with other CoP members. These interactions are dynamic and are affected by each person's career stage and professional development; therefore, their contributions will vary over time (Klein et al., 2005; Roberts, 2006; Wenger, 2010).

The term 'strategic CoP' differentiates intentionally created CoPs within an organisation (Bolisani & Scarso, 2014). Cross et al. (2006) propose that formalised strategic CoPs can succeed when focused on improving knowledge flow; responding to critical problems or opportunities; driving innovation; nurturing value-adding interactions; and engaging with employees. Various notable companies have implemented strategies to deal with knowledge and its transfer to improve business performance, for example, Shell™, Allianz™, Ford™, Caterpillar™, Ernst & Young™, IBM™, and HP™ (Bolisani & Scarso, 2014). Agrawal and Joshi (2011) believed that strategic CoPs could be successful under the right 'seeding conditions'.

Although the notion of 'cultivation' departs from the seminal view of CoPs as spontaneous and informal, (Wenger et al., 2002) eventually acquiesces to this approach Wenger et al. (2002) outlined an evolving approach that provides design guidelines for

building and managing the CoP effectively, proposing new roles of community leaders, champions, and facilitators to manage CoP activities. It has been suggested that managers who attempt to facilitate these communities should grant strategic CoPs some autonomy and minimise any obstacles to participation; “[w]hat is required is engaging with them without attempting to control them” (Wenger, 2006, p. 4).

Whether informally or formally constituted, CoPs require supportive measures to succeed in an organisational setting; “the most successful communities have always combined bottom-up enthusiasm and initiative from members with top-down encouragement from the organisation” (Wenger, 2004, p. 6). Conversely, the factors that constrain the effectiveness of CoPs include lack of leadership; inappropriate power dynamics; lack of management sponsorship; and lack of members’ commitment (Agrawal & Joshi, 2011).

Within the symbolism that defines CoP membership, the tacit knowledge meaningful to insiders might be difficult for outsiders to absorb (Burt et al., 2013). The healthcare sector has seen mixed results from efforts to use strategic CoPs. For example, a UK NHS example failed to formalise pre-existing informal professional networks (Addicott et al., 2006). The strategic CoP objective of having participants conform to set protocols to achieve performance targets had an unintended consequence by degrading existing informal knowledge exchange and learning networks. Despite the mixed results of strategic interventions, CoPs are still considered necessary for the human-oriented approach that considers knowledge inseparable from members’ experience of social networks (Bolisani & Scarso, 2014; Wenger-Trayner & Wenger-Trayner, 2015). CoPs in allied health provide an opportunity to foster the flow of evidence-based knowledge and contribute to professional skill acquisition.

In summary, further opportunities for profession related learning due to CoPs are based on social networks (Wenger, 1990). CoPs typically describe groups with a common interest in increasing knowledge and expertise through ongoing social interactions. In addition, the early mentions of CoPs in the literature discussed them as being informal, with members volunteering their time to participate. The members typically had various levels of expertise; however, the idea of ‘legitimate peripheral participation’ implies a hierarchical membership structure (Lave & Wenger, 1991). Notwithstanding the CoPs form, they can enhance profession related learning due to knowledge sharing, and their contributions will vary over time due to career progressions and CPD.

Successful, profession related CoPs require organisational support combining members' enthusiasm with managerial encouragement. In contrast, dysfunctional CoPs are likely to lack leadership or have inappropriate power dynamics among the members. Nevertheless, despite mixed results of strategic CoPs, they are considered to instil a human-oriented approach predicated on profession related knowledge being inseparable from workplace experiences. Therefore, the research study described in this thesis will explore whether CoPs in allied health contribute to evidence-based knowledge and skill acquisition.

#### **2.4.8 Professional expertise**

The formal and informal CPD programs of allied health professionals contribute to developing profession related knowledge and expertise. Traditionally recognised professions have been central to providing some classes of specialised knowledge and skills for many years. However, as discussed earlier in the literature review, many professions in contemporary society no longer hold the social and legal privileges previously afforded to them. As a result, many expert tasks have been disaggregated into tasks suitable for non-professional workers (Susskind & Susskind, 2016). However, there is still a demand for some occupations with more specialised knowledge fuelled by scarcity and economics (Burns, 2019b). The efficiency and effectiveness of performing occupational tasks are related to workers' knowledge, expertise, and attributes in many specialised domains:

The basic claim of Skill Acquisition Theory is that the learning of a wide variety of skills shows a remarkable similarity in development from initial representation of knowledge through initial changes in behaviour to eventual fluent, spontaneous, largely effortless, and highly skilled behaviour, and that this set of phenomena can be accounted for by a set of basic principles common to the acquisition of all skills (DeKeyser, 2007, p. 94).

Contemporary explanations of professional skill acquisition frequently arise from cognitive psychology studies, and approaches are often conceptually represented as stage-models. The number and nature of stages vary in different models, but all proffer stages achieving progressively higher knowledge, skills, and attribute acquisition (Dall'Alba & Sandberg, 2006).

One of the enduring stage-models of skill acquisition was initially proposed by Dreyfus and Dreyfus (1980). Their understanding evolved over subsequent years and the Dreyfus et al. (1986) version is frequently cited in the literature. Their model suggests figurative step-wise progression in professional development as individuals become increasingly skilled at their job (Table 4). The biological age of the 'novice' is not presumed; however,

the more advanced stages of ‘proficient’ and ‘expert’ (Dreyfus et al., 1986) infer that the professional has worked in the profession for an extended time. The Dreyfus et al. (1986) model also discusses that a professional may simultaneously be an expert in some skills but have less expertise in others.

### Stages of skill acquisition

Research into skill acquisition processes has revealed that people usually pass at least five and sometimes six qualitatively different stages characterising task performance and decision-making modes with increasing experience (Benner, 2004; Dreyfus & Dreyfus, 1980, 2008; Dreyfus et al., 1986). The stages identified are detailed in Table 4.

**Table 4**

*Stages of Skill Acquisition*

<b>Stage 1: Novice</b>	People with no practical experience rely heavily on rules-based guidance for their practice. Typically, instructors break down tasks into context-free features that are easily recognised.
<b>Stage 2: Advanced Beginner</b>	People continue to expect to be provided with definitive answers, but with more experience, contexts and general truths are more easily identified,
<b>Stage 3: Competence</b>	With more experience, potentially relevant procedures are less misconstrued. As a result, competent professionals restrict themselves to focusing on pertinent features, increasing understanding, and decide to adopt more planning.
<b>Stage 4: Proficiency</b>	People now move on to synthesise knowledge and skills, trusting intuition and developing a holistic understanding of the practice. They learn to accept the anxiety of intuitive responses with an understanding of skills replaced by more decisions regarding the salient aspects of practice.
<b>Stage 5: Expertise</b>	The expert intuitively understands context with practice no longer governed by rules. The expert’s extensive repertoire of perspectives allows prompt, effortless responses that require little deliberation.
<b>Stage 6: Mastery</b>	The mastery stage requires reflective practice that is more holistic. In addition, mastering domain specialist’s skills require natural talent and a willingness to persevere beyond that of other experts.

*Note:* Stages of skill acquisition from novice to mastery. (Dreyfus & Dreyfus, 2008; Dreyfus et al., 1986).

Stage one of the Dreyfus et al. (1986) model of skill acquisition is when a ‘novice’ looks for objective facts and features relevant to the skill, learning mainly from rule-based information to determine their actions. Unfortunately, people without practical experience rely heavily on generalisable rules to guide their practice. In addition, they prefer each particular situation to be clearly and objectively defined. Therefore, the novice does not refer to the overall context in which they occur. Instead, they judge their performance



based on whether they adhered to the rules; however, these domain-independent rules typically produce poor quality, real-world performances.

Stage two of the Dreyfus et al. (1986) model is that of 'advanced beginner', achieved through practical experience in real-world situations. While recognising some practice patterns, people at this stage still have limited experience and still prefer rules to follow. However, the real-world experience provides a new understanding of specific contextual features, and after witnessing enough examples, the advanced beginner learns to recognise relevant distinctions.

Stage three of the Dreyfus et al. (1986) model is 'competence', which comes with more numerous recognisable experiences, but still contains context-free aspects of practice. Therefore, people need to adopt hierarchical decision-making to prevent becoming overwhelmed, involving planning and examining fewer but more important factors to guide their performance of tasks. Unfortunately, some people may become attached to rule-based thinking in the first three stages of skill acquisition. As a result, being risk-averse, they may remain at the competence stage, tending to be highly analytical and typically preferring rules-based practice. On the upside, this equips them to be good teachers of novices and advanced beginners (Dreyfus & Dreyfus, 2008). Research has shown that the competence stage is commonly achieved after two to three years of practice experience (Benner, 2004).

Stage four of the Dreyfus et al. (1986) model of skill acquisition is 'proficiency' when people will be deeply involved in their tasks and note which job features are salient while ignoring less critical elements. The proficient professional's extensive library of past experiences will prompt memory of previously successful responses, with an almost effortless understanding of situations. In addition, this stage requires synthesising knowledge and skills while developing a more holistic understanding of practice. Finally, proficient professionals often exhibit greater involvement and intuition in daily practice.

Stage five of the Dreyfus et al. (1986) model is 'expertise', where the expert has a mature and practised understanding of their skill-set. In addition, experts are no longer solving problems of everyday practice; instead, they become autonomous and non-reflective. However, not all professionals achieve an expert level of skill (Benner, 2004; Dreyfus & Dreyfus, 2008), and Benner (2004) suggests that allied health professionals without a holistic understanding of practice may never progress to expert status. For individual skills that are more difficult to master, deliberation by an expert may involve critically

reflecting on their intuitions. Expert actions may confuse novices because they require an ‘intuitive perspective’, and experts often have difficulty teaching novices and early beginners (Dreyfus & Dreyfus, 2008). However, the renowned problem of so-called ‘experts’ in communicating with other people due to the disparity of expertise has sometimes been attributed “to psychological factors such as arrogance” (Selinger & Crease, 2002, p. 255).

After determining the initial five stages of skill acquisition (Dreyfus et al., 1986), the stage-model was augmented with an additional step of ‘mastery’, which was reintroduced from earlier research (Dreyfus & Dreyfus, 1980, 2008). The sixth stage requires a distinctive manner of deliberative reflection that requires exceptional natural talent and a conscious decision to excel in the chosen profession. In addition, mastery requires being willing to persevere to become more than an ordinary expert, only achieved by a small fraction of experts (Dreyfus & Dreyfus, 2008). The original Dreyfus et al. (1986) stage-model also discusses how a professional can be an expert in one domain while still a novice in others, suggesting that life-long learning does not progress at the same pace for all aspects of practice. Other research also acknowledges that professionals may do some things expertly, some competently, and others as a novice (Weadon, 2007). Despite the demarcations in skill acquisition stage-models, they allude to a continuum of profession related learning.

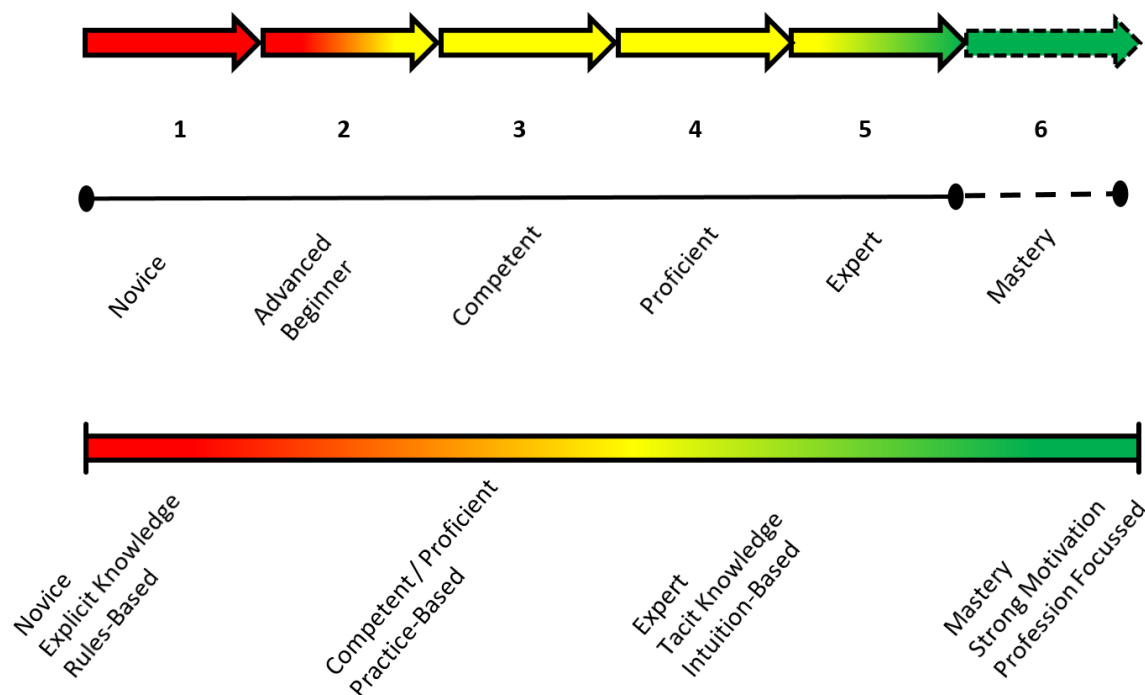
### **Continuum of skill acquisition**

Many skill acquisition models propose sequenced stages, suggesting stepping up to progressively higher levels of knowledge, skills and attribute acquisition (Dall’Alba & Sandberg, 2006; Dreyfus et al., 1986). However, the concept of a continuum is also a common explanation for progress between novice and expert practitioners (Attri, 2019). Therefore, the stepwise stage-models of skill acquisition are compared to a continuum based representation in Figure 6.

The learning necessary to enhance professional knowledge and expertise may be derived from either explicit or tacit knowledge sources (Nonaka, 1994). Differentiation between explicit and tacit knowledge correlates well with skill acquisition models, with the relative contribution from the most valuable knowledge sources changing with increasing professional expertise; novices learning more from explicit rules, and experts learning more from tacit sources (Benner, 2004; Dreyfus & Dreyfus, 1980; Dreyfus et al., 1986).

**Figure 6**

*Stages of Skill Acquisition versus Continuum of Skill Acquisition*



Note: The figure expresses the rules-based learning preferred by novices and advanced beginners in red; increasingly tacit intuition-based learning in yellow; and more holistic deliberative reflection in green (Attri, 2019; Dreyfus & Dreyfus, 1980, 2008; Dreyfus et al., 1986).

Therefore, learning from tacit knowledge, derived directly from challenging experience and vicarious learning from skilled colleagues, becomes increasingly crucial as professional expertise increases. Eraut (2011) estimated that as much as 70-90 per cent of professional learning occurs through tacit knowledge exchange from informal on-the-job activities. Therefore, the contribution of work structure, including challenging practice and learning alongside experts, is central to experienced professionals' expertise and development.

As discussed previously, maintaining and enhancing profession related knowledge and expertise may be derived from explicit or tacit knowledge sources. There is compatibility with the distinction between explicit and tacit knowledge and skill acquisition models; these knowledge sources' contribution changes as professional expertise increases. Therefore, novices learn best from explicit rules-based information, whereas experts learn more from tacit knowledge derived from challenging practice and vicarious learning. Skill acquisition models provide tools for presenting a dichotomy of allied health professionals' expertise relative to their preferred learning styles as a pertinent factor to

be explored in this study. In addition, the contribution of work structure to profession related expertise is central to the research described later in this thesis. Therefore, the study in this thesis explores whether challenging practice and learning alongside expert colleagues are available for more experienced professionals in regional hospitals.

#### **2.4.9 Professional competency frameworks**

This research also explores hospital managers' and allied health professionals' perspectives regarding the knowledge, skill-sets, and attributes required for high-quality practice. In addition, this study explores whether those necessary competencies are present in the CPD programs of allied health professionals.

This subsection of the literature review will provide background for the subsidiary research question:

- Which competencies do hospital managers and allied health professionals consider necessary for good practice?

The education of professionals typically focuses on achieving knowledge, skills and attributes identified as necessary for competent practice in the workplace. After completing profession-specific tertiary training, the expectation is that newly qualified practitioners possess sufficient knowledge and skills to be competent for their initial scope of professional practice. However, the self-directed nature of CPD introduces unique challenges to professionals who must then establish their own goals and objectives. Therefore, professional practice may vary considerably among individuals as their careers progress, and any attempts to address CPD needs collectively may be misguided. Hence, self-identified gaps in knowledge, skills, and attributes should focus on designing and implementing a personalised learning program (Sachdeva, 2016).

Being 'competent' is a generic term referring to a person's overall capacity to safely carry out the work in their chosen occupation. However, the term 'competencies' has also been used to categorise the knowledge, skill-sets, and attributes required to meet the profession's overall goals (Englander et al., 2013). As described earlier in this thesis (subsection 2.4.8), individual professional competencies may also be considered as skill-sets. These competencies can describe either 'hard' skills typically relating to the technical aspects of the job and the performance of tasks, or higher-level 'soft' generic skills, including personal attributes that enhance self-awareness, self-management, interpersonal communications and social awareness (Johnston & McGregor, 2004;

O'Byrne & Dell'Aquila, 2014; Stefanovski, 2020). Therefore, as an alternative to task-based classifications, CPD has been proposed to address these discrete skill-sets or competencies, each combining theoretical knowledge, practical clinical skills and socially normative behaviours (Englander et al., 2013).

It would be impossible to fully define all of the competencies of competent allied health professionals. However, competency frameworks provide a more holistic, organised and structured representation of interrelated and purposeful competencies or generic skill-sets (DHHS, 2016). Competency frameworks aggregate 'domains of competence' with distinguishably similar areas of competence grouped under one heading (Englander et al., 2013). In addition, competency-based CPD does not view the notion of competence as static or merely aiming to maintain knowledge and skills but also seeks to develop capabilities in response to an uncertain future (Campbell et al., 2010; DHHS, 2016).

The concept of capability refers to the capacity to function under ambiguous and unfamiliar circumstances. Therefore, capability development requires non-traditional and unstructured methods that would otherwise inhibit learners when exploring the complexities of modern-day healthcare (DHHS, 2016). Efforts by government and professional associations to develop competency standards attempt to provide representations of competent practice within an occupation or profession (Hager, 2017). Hence, they describe the occupation's main tasks and set standards for satisfactory performance and preferred practitioner attributes (Hager, 2017).

The Victorian Government's Allied Health: Credentialing, Competency and Capability Framework is one standard implemented within organisational settings (DHHS, 2016). The first component, credentialing, involves judging a person's suitability to provide healthcare services by verifying tertiary and post-graduate qualifications. The second component, or 'competency framework', aims to supplement CPD and governance processes within an organisation (DHHS, 2016). Finally, the third component, capability incorporates skills, knowledge and attitudes, including professional expertise developed over time through formal and informal learning. The 'capabilities' in this document are comparable to the discrete competencies described earlier, combining theoretical knowledge, practical clinical skills and socially normative attitudes (DHHS, 2016; Englander et al., 2013).

The hospitals in which allied health professionals work use various competency measures. Most common are binary scales such as competent versus not competent or

satisfactory versus unsatisfactory (DHHS, 2016). These measures require allied health professionals to meet the criteria for performance specified in a competency framework. For example, an ‘Entrustable Professional Activity’ (EPA) is a binary measure in which a person must demonstrate the competence necessary to undertake an activity unsupervised successfully (ten Cate, 2017). In addition, EPAs may require an allied health professional to integrate several discrete competencies from different competency domains.

Alternatives to binary scales are skills’ stage-models, which allow for mapping the progression of individual allied health professionals or groups. As discussed previously, an example of a stage-model is the Dreyfus et al. (1986) model of skill acquisition, which progresses through sequential stages from novice to expert. These models can help determine the most appropriate type of CPD activities for people with various levels of professional expertise.

To accommodate all healthcare professions and compile a common taxonomy of competencies, Englander et al. (2013) articulated the core competencies common to a wide range of healthcare competency frameworks, presented in Table 5.

**Table 5**

*Taxonomy of Competency Domains for Healthcare Professions*

1. **Patient Care:** Provide patient-centred care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health;
2. **Knowledge for Practice:** Demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioural sciences, as well as the application of this knowledge to patient care;
3. **Practice-Based Learning and Improvement:** Demonstrate the ability to investigate and evaluate one’s care of patients, appraise and assimilate scientific evidence, and continuously improve patient care based on constant self-evaluation and life-long learning;
4. **Interpersonal and Communication Skills:** Demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals;
5. **Professionalism:** Demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles;
6. **Systems-Based Practice:** Demonstrate an awareness of and responsiveness to the larger context and system of healthcare, as well as the ability to call effectively on other resources in the system to provide optimal healthcare;
7. **Interprofessional Collaboration:** Demonstrate the ability to engage in an interprofessional team in a manner that optimizes safe, effective patient- and population-centred care;
8. **Personal and Professional Development:** Demonstrate the qualities required to sustain lifelong personal and professional growth.

*Note:* This taxonomy of competency domains was developed for use by all healthcare professions (Englander et al., 2013, pp. 1091-1092).

The resulting taxonomy builds on the foundational work of the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Medical Specialties (ABMS). The research resulted in eight competency domains and 48 higher-level generic competencies (Appendix D). The competency domains include patient care; medical knowledge; interpersonal and communication skills; professionalism; practice-based learning and improvement; systems-based practice; interprofessional collaboration; and personal and professional development (Englander et al., 2013). The final competency domain listed includes personal development, which might not typically fall under the professional CPD umbrella; however, a close interrelationship can exist between CPD and individual personal development (Englander et al., 2013; Meyers et al., 2015).

In addition, personal development may also be treated as a purposive activity, resulting in personal growth and increasing emotional intelligence. Traditionally, personal development interventions have focused on addressing people's deficiencies or weaknesses (Swanson & Holton, 2001). However, targeting unique strengths is also likely to affect motivations positively. In addition, increasing emotional intelligence from personal development also reinforces socially acceptable attitudes and behaviours integral to allied health professional practice.

The objective of CPD is to maintain and enhance best-practice knowledge, skills and attributes to support professional competence and increase professional expertise. Therefore, a deliberative strategy for knowledge, skills and attribute acquisition employing a taxonomy of professional competencies could enhance the holistic understanding of allied health professionals and improve the outcomes of their CPD programs. With talent, motivation and effective CPD, health professionals can progress beyond being merely competent to more expert levels of knowledge, skills and attributes.

In summary, newly qualified practitioners should possess sufficient knowledge and skills to enable safe practice within their graduate positions. However, CPD is self-directed and introduces new challenges to allied health professionals who must determine their own goals and learning objectives by identifying gaps in their knowledge and skills in designing and implementing a personalised learning program. Competency frameworks allow a holistic and structured representation of generic profession related skill-sets and preferred practitioner attributes. CPD programs with a deliberate strategy for acquiring knowledge, skills and attributes may benefit from employing a taxonomy approach to professional competencies such as the taxonomy provided by Englander et al. (2013).

Therefore, the research study described in this thesis explores whether competency domains from the Englander et al. (2013) model are contemplated or included in the CPD programs of interviewees.

#### **2.4.10 CPD planning**

This subsection of the literature review will briefly explore deliberative planning related to allied health professionals' CPD programs and provide background for the subsidiary research question:

- What factors influence the planning of CPD programs undertaken by allied health professionals in regional Victorian public hospitals?

Typically CPD schemas portray a cycle of reflection, planning, learning and evaluation. However, government bodies and professional associations are increasingly relying on input measures of CPD to provide evidence that professionals are maintaining their clinical competence. For example, a UK study found that government bodies and professional associations acknowledge the importance of reflective practice by suggesting some component of reflection-on-practice or making it a mandatory element of CPD (Karas et al., 2020). However, there was little evidence of future planning for learning needs being expected by regulators or undertaken by individuals.

As discussed previously, Billett (2001) describes workplace affordances or opportunities for participation provided by employers in the learning experiences of CPD. These learning opportunities can be part of a guided workplace curriculum, including modelling, coaching, questioning, and analogies to enrich work activities. Organisations demonstrate various levels of willingness to offer a variety of affordances to their employees, depending on their perceptions of strategic value:

The degree by which workplaces provide rich learning outcomes through everyday activities and intentional interventions will be determined, at least in part, by its readiness to afford opportunities and support for learning (Billett, 2001, p. 210).

For the full benefits of CPD to be realised, organisations and individuals need to plan CPD programs while being mindful of their current work circumstances and future career aspirations (Eddy et al., 2015; Henwood & Huggett, 1999). It is no longer sufficient that people merely undertake CPD activities in an ad hoc fashion; instead, more significant benefits flow from developing individual strategic learning plans (Dowds & French, 2008; Eddy et al., 2015; Eraut, 2001; Poell & Van Der Krogt, 2016).



It sometimes seems forgotten by organisations and individuals that formal CPD activities are not the only source of professional learning. However, Eraut (2004) found that some day-to-day work activities result in significant knowledge acquisition. Examples of this type of work includes participating in team projects such as policy reviews; working alongside others, vicarious learning; tackling challenging tasks; working directly with clients. However, the learning opportunities available at work often go unnoticed and are taken for granted (Eppich et al., 2016; Eraut, 2004). Despite the significant contribution of informal learning through day-to-day work activities, the management of opportunities to facilitate tacit knowledge transfer is worthy of inclusion in organisational and individual strategic learning programs.

For allied health professionals, deciding which CPD activities will contribute to more effective practice is challenging. Of course, research evidence and anecdotal advice from colleagues can improve practice, but a deliberative reflection on current practice is the key to a strategic approach to CPD (Dowds & French, 2008; Englander et al., 2013; Eraut, 2000; Plack & Greenberg, 2005).

The professions explored in this research advise their members to implement a strategic approach to self-directed CPD programs. For example, the CPD guidelines from the Medical Radiation Practice Board of Australia (MRPBA), which governs the profession of radiography, suggest self-reflection where practitioners review their knowledge and skills, and monitor the effectiveness of CPD activities (MRPBA, 2015). This approach also aligns with professionals contemplating their CPD needs in response to personal strengths, limitations and career aspirations (Eddy et al., 2015; Wareing et al., 2017). Planning of CPD programs has been found to be insufficient in radiography; however, managers and allied health professionals have opportunities to discuss departmental objectives and individual needs, negotiating areas of responsibility between them (Henwood & Huggett, 1999).

In another example, sonographers also have a wide range of CPD activities permitted in fulfilling mandatory CPD requirements for professional registration. The Australian Sonographer Accreditation Registry (ASAR) provides CPD guidelines that encourage self-reflection on CPD activities and day-to-day practice (ASAR, 2022). Although there is a belief in the sonography profession that planning CPD programs are worthwhile, less than 50 per cent of sonographers reported planning for CPD (Phillips, 2011). In addition, many sonographers did not plan or felt they did not plan well,

preferring to use ad hoc learning opportunities when available. Personal circumstances, including family commitments, the costliness and time involved with formal CPD activities, are also identified as preventing sonographers from planning (Phillips, 2011).

Finally, the Physiotherapy Board of Australia (PBA) provides CPD guidelines that suggest that planning of CPD should result from reflection-on-practice and reflection-on-learning after CPD activities are completed (PBA, 2022). In addition, the concept of professional development portfolios (PDPs) proposed for physiotherapy involves identifying learning needs and developing a strategic approach (Dowds & French, 2008; Kardos et al., 2009). In conclusion, the guidelines and tools available from the professions involved in this study should facilitate CPD planning and documentation; their ideals may also contribute to broader lifelong learning for career and personal progression.

In summary, typical CPD models portray a cycle of reflection, planning, learning and evaluation. Australian government bodies and professional associations are increasingly aware of the importance of reflective practice, including it as an eligible informal element of CPD. However, there is little evidence in the literature of deliberative planning for CPD undertaken by allied health professionals. Therefore, individuals need to move away from ad hoc arrangements and plan CPD programs to maximise their benefits from profession related learning. In addition, organisations and individuals sometimes forget that formal CPD activities are not the only source of professional learning. For example, Eraut (2004) found that everyday work activities such as tackling challenging tasks, working alongside colleagues, and team projects can result in meaningful learning. However, despite the contribution of informal learning through deliberately planned day-to-day work activities, many managers and individuals miss out on these opportunities to learn from tacit knowledge sources.

Planning CPD programs may be challenging; however, deliberative planning based on reflective practice is crucial to maximising learning outcomes (Dowds & French, 2008; Englander et al., 2013). In contrast, CPD planning has previously been deemed insufficient in the professions in this study and many allied health professionals in this study feel they do not plan well, using ad hoc learning instead (Henwood & Huggett, 1999; Karas et al., 2020; Phillips, 2011; Schenk, 2014). The research study detailed later in this thesis will explore the status quo regarding hospital and allied health professional participants' involvement in the planning of CPD programs. In addition, the study will

determine whether hospitals or allied health professionals exploit informal learning opportunities from everyday practice.

#### **2.4.11 Effectiveness of CPD**

People with professional occupations expect to engage in CPD activities to maintain and enhance their knowledge, skills, and professional attributes to provide safe and effective services to society. There is a need to demonstrate the efficacy of CPD programs; however, identified obstacles to measuring CPD outputs include the inherent difficulties in measuring high-level generic or 'soft' professional skills (Johnston & McGregor, 2004). Measuring 'effectiveness' alludes to comparison against a chosen outcome; however, internationally, current CPD requirements for professional registration favour quantitative evaluation of CPD programs using input-based minimum hours (Allen et al., 2019). The downside of this system is that input-based CPD schemes do not guarantee any learning or change in practice (Friedman & Woodhead, 2008).

The difficulty in measuring outputs has resulted in CPD participation being recorded as inputs and documenting CPD hours undertaken per annum. Various government and professional bodies mandate a minimum number of hours of participation each year (examples previously depicted in Table 2), with limitations on certain CPD activities or a requirement for participation in a diverse mix of activities. However, documenting inputs presumes that all CPD activities will benefit the knowledge or skills of the individual, when this may not be true (Sargeant et al., 2011). Input-based approaches provide an easily demonstrable and quantifiable record of CPD with relatively low implementation costs. Although, many consider this a 'tick-box' approach rather than providing tangible evidence of enhancing professional knowledge and skills (Friedman & Phillips, 2004).

What constitutes effective CPD is still contested (Karas et al., 2020). Many commonly used learning outcomes are detailed as 'categories of impact' by Allen et al. (2019) and include knowledge, as the most widely measured; practice change; skill; confidence; attitudes; career development; networking; personal change; organisational change; and scholarly accomplishments. Therefore, when CPD activities address intended outcomes and are assessed successfully, they achieve educational 'alignment' (MacDougall et al., 2017). However, others believe that the 'effectiveness' of CPD is so complex and multi-dimensional that assessment may be an impractical proposition (Schostak et al., 2010).

Madden and Mitchell (1993) present examples of input-based and output-based systems. These antithetical systems are bolstered by a 'sanctions model' with negative consequences for breaching mandatory requirements, or a 'benefits model' with positive reinforcement for compliance with output-based systems. The input or sanctions model emphasises the public demonstration of compliance with CPD requirements. Generally, sanctions models are compulsory and monitored by government or professional associations, with non-compliance sanctioned with some form of rebuke or punishment. In contrast, benefits models are used infrequently but are usually voluntary and focused on learning outputs such as professional knowledge, hard and soft skills, and personal attributes that benefit professional practice (Friedman & Phillips, 2004; Friedman & Woodhead, 2008). Regardless of the model used, CPD programs in allied health should satisfy professional registration requirements and promote best-practice knowledge and skills (Ramani et al., 2019). However, because the CPD activities undertaken by allied health are largely discretionary, the emphasis placed on content and the focus on hard or soft competencies is self-determined.

Assessment of the impacts of CPD that focus on knowledge, behaviour, confidence and skills are frequently based on the four levels of evaluation as described in Kirkpatrick and Kirkpatrick (2006). The model developed for use in management describes four levels for assessing CPD programs: 1) Reaction; 2) Learning; 3) Behaviour; and 4) Results. Level 1 measures participants' reactions or customer satisfaction, and Level 2 represents how much participants gain new knowledge, improve their skills or change their attitudes. Furthermore, the impacts on outcomes in these two levels are easily defined and relatively easy to measure; however, levels 3 and 4 are less clearly defined and more difficult to measure (Allen et al., 2019).

Level 3 of the Kirkpatrick and Kirkpatrick (2006) model attempts to measure behavioural change on return to the workplace. In addition, it classifies organisational climate that enables or constrains any difference in practice; described as preventing, discouraging, neutral, encouraging, or requiring. In addition, Level 4 of the model attempts to measure the overall results of the CPD activity and includes wide-ranging tangible improvements in quality, staff turnover, human relations, productivity, and profits or reduced costs. However, the authors acknowledge that it is not easy to measure intangible outcomes such as leadership, communication, motivation, empowerment and decision-making (Kirkpatrick & Kirkpatrick, 2006). Changes in an individual's knowledge and skills are

measurable by testing and assessment after a formal CPD activity. However, teaching new knowledge and skills does not always improve practice (Allen et al., 2019).

As mentioned previously, the multi-dimensional nature of CPD effectiveness is not easily defined when attempting to simultaneously satisfy individual, group and organisation interests. For example, managers are concerned with the effectiveness of CPD activities in achieving organisational objectives; however, employees focus on the learning required to improve workplace performance and advance their careers (Billett et al., 2015; Billett et al., 2014). Nevertheless, the expectations of managers and employees underpin four predominant models that (Billett et al., 2015) determined as effective for work-related training, as depicted in Table 6.

**Table 6**

*Models of Effective Continuing Education (CE) and Training*

<b>Models of effective CE &amp; training</b>	<b>Summary description</b>
Wholly work-based experiences	Learning through on-the-job experiences in everyday work; learning on one's own and/or supported by more experienced co-workers.
Work-based experiences with direct guidance	Learning at work is supported by the direct guidance or mentoring of more experienced co-workers or supervisors through joint work activities and supported activities, for learning that cannot be acquired without the assistance and demonstration of more experienced workers.
Work-based experiences with educational interventions	Learning which combines learning undertaken through workplace activities and interactions supported by expert input from trainers; or using projects, such as action learning to extend this learning and enhance practice aspects of work. The learning is often accredited and leads to certification.
Wholly education institution-based experiences	Continuing education and training through programs based in education institutions or offered online. Experiences provide the kinds of learning individuals require for specific goals, such as changing occupations or developing new skills which cannot be learned through current work.

*Note:* Adapted from Towards more effective continuing education and training for Australian workers by Stephen Billett, Sarojni Choy, Darryl Dymock, Ray Smith, Amanda Henderson, Mark Tyler, Ann, 2015 (p. 15) ([ncver.edu.au/research-and-statistics/publications](http://ncver.edu.au/research-and-statistics/publications)). In the public domain.

Three CE and training models were considered the most effective by Billett et al. (2015). These included work-based experiences with direct guidance, such as mentoring; wholly work-based experiences, through everyday work experiences, alone or supported by

experienced colleagues; and work-based experiences with educational interventions, combining on-the-job learning and supported by expert trainers. Billett (2014) concluded that training is most useful when supported through workplace-oriented expertise and one-on-one instruction, reinforced with follow-up guidance, allowing time for reflection, and then being assessed for effectiveness.

The need for CPD in healthcare professions is widely acknowledged; however, the effectiveness of CPD on professional development is under-researched (Allen et al., 2019). The literature contends that effective CPD programs require flexible learning options based on individual learning needs, focussing on reducing the theory-practice gap, and integrating with everyday working practices (Gristi & Jacono, 2006; Schostak et al., 2010). In addition, effective CPD programs exhibit contextual considerations, integrating organisational and individual workers' learning needs. The most effective CPD for allied health professions should meet the combined needs of individual practitioners, patient cohorts, workplaces, professional associations and government agencies (Schostak et al., 2010; Yardley & Dornan, 2012). However, the complexities of healthcare settings and competing goals may mean that assessing on-the-job CPD effectiveness may be unsuitable for quantitative measurement and, therefore, infeasible. Furthermore, many desirable CPD outcomes for allied health professions also reside in level 4 of the Kirkpatrick and Kirkpatrick (2006) model, including interpersonal relationships, collaboration, networking, CoPs and organisational change. Therefore, some personal and professional attributes suffer neglect as output measures of CPD (Allen et al., 2019; Yardley & Dornan, 2012).

In summary, government and allied health professional bodies typically prefer input-based 'sanctions models' of CPD. Input-based approaches postulate that all CPD activities are beneficial, and these models provide quantitative measures of CPD, relying on negative consequences for breaching mandatory requirements. However, some people do not believe they provide enough tangible evidence of enhancing profession related knowledge and skills (Friedman & Phillips, 2004). In contrast, output-based 'benefits models' propose positive reinforcement as a reward for compliance. However, quantifying the benefits of CPD activities requires measuring the effect on professional practice, especially high-level 'soft' professional skills, which may make these models infeasible.

The complexity of allied health CPD arises from the need to improve practitioners' knowledge, skills, and attributes while meeting the expectations of numerous other stakeholders (Gristi & Jacono, 2006; Schostak et al., 2010). Effective CPD should be self-directed; however, workplace support is also required to develop organisational learning cultures (Manley et al., 2018). Therefore, CPD programs should encourage a more comprehensive range of CPD models beyond the limitation of quantifiable input-based measures of knowledge, skills and attributes. Future mechanisms to measure the impacts of CPD programs should encourage qualitative measures of soft competencies that are otherwise difficult to assess. An underlying assumption of the study described in this thesis is that broader conceptualisations of CPD include informal everyday learning opportunities that should improve the effectiveness of CPD in a broad spectrum of 'impacts' on work-related learning and workforce development (Allen et al., 2019).

## **2.5 Conclusion**

This study's allied health professional respondents participate in CPD programs to maintain professional registration and enhance their knowledge and expertise. In addition, the study explores hospitals' KM regarding profession related knowledge and its effect on the respondents' CPD programs. The preceding sections review published literature that informs the study presented in this thesis.

The literature review begins by exploring the sociology of professions. Members of professions hold high social standing because they satisfy the highly-valued needs of society and commit to maintaining their specialised knowledge and expertise. Therefore, society and the state expect them to work with high levels of safety and efficacy, and commit to ongoing CPD programs. In addition, professionals are expected to exhibit exemplary performance and behaviour in their everyday work.

The second section of this review explores KM of profession related knowledge and hospitals' KM systems and the facilitating factors that enable knowledge-seeking and sharing behaviours among allied health professionals. Furthermore, fundamentally different perspectives of KM were identified in the literature review, following an organisational approach relying on explicit knowledge or a personal approach relying on personally held tacit knowledge. The literature also includes models of KM that exhibit different attributes. Enabler models of KM are predicated on the tacit aspects of human knowledge and these models suggest that improving social relationships will increase knowledge-seeking and sharing behaviours. Whereas, knowledge-oriented models rely on

notions of explicit and tacit knowledge, exploiting knowledge assets and maximising organisational memory. In contrast, contingency models of KM depend on managers' understanding of contextual considerations and employees' knowledge-seeking and sharing behaviours. For example, Sanchez (2006) describes the fundamental personal or organisational knowledge approaches; however, he recommends hybrid forms that align with organisational goals. The study described in this thesis explores whether hospitals focus on organisational or personal KM approaches. In addition, the study will explore whether hospitals' KM approaches incorporate allied health professionals' learning needs. Unfortunately, the literature review found scant evidence of KM models' effectiveness. However, many KM models require time and resources that the hospitals in this study may not find feasible.

The third section of the literature review explores adult and social learning research, which suggests adopting adult learning the principles for successful profession related learning. In addition, andragogy (adult learning) theory suggests that adults engage in reflective practice and that people constantly learn from their own workplace experiences and observing colleagues while working. Furthermore, social learning theories such as existentialism give credence to individuals' subjective perceptions of their learning. Finally, existentialism complements theories of motivation, whereby developing a person's full potential is a high-order human need, only satisfied by improving professional competence.

The final section of the literature review explores CPD. Contemporary definitions of CPD emphasise that CPD is self-directed and includes developing soft competencies and learning from everyday practice as an integral part of learning. In this section of this thesis a conceptual framework of CPD in allied health professions is represented as a Venn diagram (Figure 5). One of the framework's notable features includes informal CPD activities that contribute substantially to profession related knowledge and skills; however, many informal activities remain outside mandatory CPD prerequisites. To conclude, the literature review explores the planning of allied health professionals' CPD programs, with typical CPD schemes portraying reflection, planning, learning, and evaluation cycles. However, there is little previous empirical evidence that the allied health professions in this study undertake medium or long-term CPD planning.

The following chapter describes the research context of the Australian healthcare system, Victorian public hospitals, and a brief review of radiography, sonography and



physiotherapy professions. These allied health professions were purposefully selected to participate in the research study described later in this thesis (Chapters 4, 5 & 6).

### **3 Research Context**

Human health is affected by a range of complex interactions between peoples' genetic make-up, lifestyle impacts and experiences, and their social environment. A person's overall well-being depends on the determinants or factors that influence their health and the interventions undertaken to maintain good health. Despite Australia's health system being touted as one of the best globally, healthcare experiences and outcomes differ depending on socio-economic status and geographical location (AIHW, 2020b).

The World Health Organization (WHO) recommends that National healthcare systems provide effective, efficient and equitable healthcare for the population (Terwindt et al., 2016). Australia's healthcare system exists in its unique socio-political environment, comprised of a historical legacy and contemporary circumstances affecting how well the healthcare system functions (Daire et al., 2020).

This context chapter provides background regarding the geographical location and characteristics of the hospitals participating in the study described in this thesis. The first section of this chapter will provide a brief overview of the Australian healthcare system. In addition, sections of the chapter will explore the Australian healthcare system, regional healthcare generally and Victorian public hospitals' role in providing healthcare services to regional communities (sections 3.1 - 3.3). The final sections of the context chapter will provide a brief background of the purposeful selection of hospitals and allied health professions participating in this study (section 3.5). The attributes of the case study hospitals and allied health professions selected for this study are elaborated further in the methodology chapter (Chapter 4).

#### **3.1 Australian Healthcare System**

Australia's healthcare system serves a widely dispersed population, providing services by combining a welfare-based taxpayer-funded public system and a market-driven private system (Daire et al., 2020). The healthcare system includes various primary healthcare services provided by doctors and allied health professionals. It is financed through a complex arrangement between the Australian federal, state and territory governments, with additional contributions from private health insurance companies and patients. The

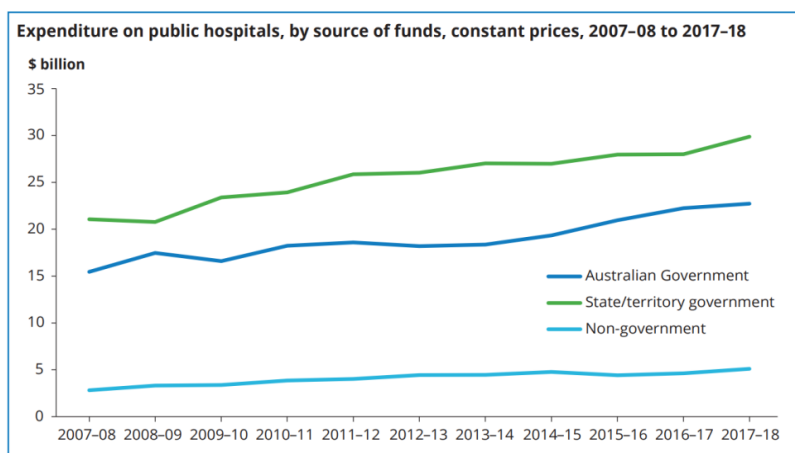
primary roles of the Australian government concerning the healthcare system include developing the national healthcare policy agenda; funding Medicare and the Pharmaceutical Benefits Scheme (PBS); providing funds for state-run public hospitals; and supporting and regulating private health insurance (AIHW, 2020a). Australia's Medicare system provides free or subsidised services from medical practitioners and other health professionals, including hospital treatments and many prescription medicines available to eligible people. However, Medicare services are only accessible to Australian or New Zealand citizens, permanent residents, or those covered by reciprocal healthcare agreements with other countries.

From a systems theory perspective, healthcare is a 'complex system' composed of numerous interacting and dynamic components, collectively affecting healthcare provision and health outcomes (Alibrahim & Wu, 2020; Engelseth et al., 2021; Page & Zelner, 2020). Australia's healthcare system constantly reacts to accommodate demographic, socio-economic and environmental changes (Daire et al., 2020). Factors such as an ageing population, changing disease patterns, greater expectations by the public and the pursuit of greater efficacy and efficiency all contribute to ongoing government responses which attempt to improve the population's health outcomes.

Hospitals are a crucial component in Australia's healthcare system and account for a large proportion of government healthcare expenditure (Duckett & Willcox, 2015). For example, Figure 7 depicts hospital funding from 2007-2008 to 2017-2018.

**Figure 7**

*Expenditure on Australian Public Hospitals*



*Note.* AIHW: Australia's hospitals at a glance 2018-19. 2019. Canberra, ACT: Australian Institute of Health and Welfare from [aihw.gov.au/getmedia/c14c8e7f-70a3-4b00-918c-1f56d0bd9414/aihw-hse-247.pdf](http://aihw.gov.au/getmedia/c14c8e7f-70a3-4b00-918c-1f56d0bd9414/aihw-hse-247.pdf) p. 3. In the public domain.

The most recently available figures (2017-2018) found that Australia's annual spending on public hospitals was \$57.7 billion (AIHW, 2019a). In addition, state and territory governments are responsible for public hospitals contributing \$29.9 billion in the financial year.

### **3.2 Regional Healthcare**

This section of the thesis provides further background information regarding the general status of regional healthcare in Australia. The estimated resident population of Australia is around 25.7 million people, of whom approximately 30% or 8.3 million people live in regional locations (ABS, 2020). Due to the distances between many regional communities and major regional centres and metropolitan cities, residents in regional areas have a higher risk of adverse health outcomes (Tham & Ward, 2016). Furthermore, some regional communities also have less access to critical social determinants of health, such as fresh food, housing, education, fulfilling employment, and public transport. However, the populations of regional Australia are not homogeneous groups. There are disparities in health status and access to healthcare between urban and rural populations' which is considered objectionable in a relatively high-income country (Ward & Tham, 2020). The problems associated with access to healthcare services are complex issues. The inequity is usually described in relative terms, often related to the lack of available healthcare professionals in regional areas (AIHW, 2019b; Duckett & Willcox, 2015).

The health of regional Australian people is also adversely affected due to changing demographics, an ageing population, increased chronic disease and lifestyle risk factors exacerbated by rural lifestyles (AIHW, 2020b). In addition, members of regional, rural and remote communities have higher rates of injury, hospitalisation and deaths, with more limited access to primary healthcare services than people living in metropolitan centres (AIHW, 2019b). Healthcare in regional areas is also affected by a reduction in the local services because funding for public hospitals is partly dependent on their proximity to metropolitan centres (ABS, 2014). In addition, access to hospital services has long been a problem in regional areas due to increased travel distances required to attend more specialised healthcare services (Duckett & Willcox, 2015).

Equitable access to healthcare is a principal concern for Australia's healthcare system, described as the 'fit' between healthcare providers and the ability of the population to utilise the needed services (Cu et al., 2021). Levesque et al. (2013) developed a framework that allowed researchers to explore healthcare systems' complex and dynamic

processes. Levesque's dimensions of access include 'availability and accommodation', referring to having appropriate healthcare facilities and the skilled personnel available to provide services for particular geographical locations. However, among most healthcare professions, there has been a noticeable decline in the availability of full-time equivalent (FTE) healthcare professionals per capita outside metropolitan centres (AIHW, 2020a).

In response to the problem of inequitable access to healthcare, the Australian government introduced a Workforce Incentive Program (WIP) as part of the Stronger Rural Health Strategy (Department of Health, 2019). The WIP's stated aim is to achieve targeted improvements in the regional population's access to medical, nursing and allied health services in regional, rural and remote areas. The strategy's primary focus is to incentivise medical practitioners to practice in regional locations, targeting problems with regional disadvantages; however, the program's limited scope excludes many allied health professions (Ward & Tham, 2020).

Despite the WIP being instituted, doctors are reportedly relocating away from regional Australia with "more than 50% in the last six months of 2022" leaving their positions in rural general practitioner (GP) clinics, (Attwool, 2023). The Department of Health and Aged Care (DoH) confirmed to Community Affairs Legislation Committee (2023) in Senate Estimates hearings that during 2020 a total of 448 GPs relocated away from regional centres. This trend continued in during 2021 with a total of 510, and again during 2022 with a total of 559 GPs relocating to larger population centres. In response, the Department of Health categorised the recent shift in GP relocations away from rural areas as 'a slight increase' because the only GPs included in the statistics are those doctors who had been obliged to work in regional Australia and that the Covid19 pandemic also affected the figures (Community Affairs Legislation Committee, 2023).

Regional healthcare professionals continue to face numerous barriers to working in rural locations, including excessive workload and accessing professional development (Department of Health, 2019; Stagnitti et al., 2005; Tham & Ward, 2016). In addition, an ongoing problem for allied health professionals is that their preferred face-to-face continuing education is often metropolitan-based (Berndt et al., 2017; Stagnitti et al., 2005).

Previous investigations of CPD and KM in healthcare organisations have focused on larger metropolitan organisations, leaving a significant research gap regarding regional and rural hospitals disadvantaged by size and geographical location (Castillo & Cazarini,

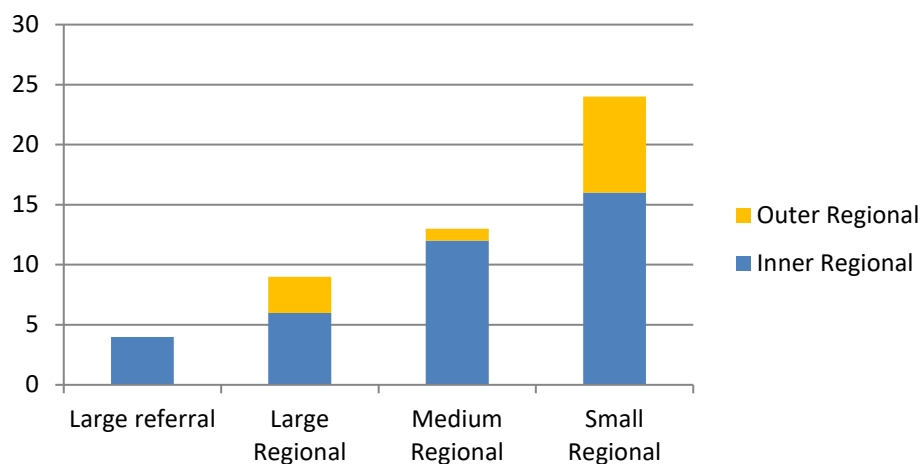
2014; Sajeve & Jucevicius, 2010). The problems of these locations compound because the allied health professionals working in regional areas often suffer professional isolation and limited CPD opportunities (Department of Health, 2012, 2019). Furthermore, inadequate CPD in Australian healthcare contributes to unacceptably high rates of medical diagnostic errors (Graber, 2013).

### 3.3 Victorian Public Hospitals

The following section provides further background information regarding Victorian public hospitals and is directly relevant to the study described in this thesis. The state of Victoria has over 300 healthcare services, including public and private hospitals, rural and regional health services, and psychiatric hospitals (DHHS, 2021). One of Australia’s conventional hospital classifications distinguishes between ‘public’ and ‘private’ hospitals; however, these categories may oversimplify their differences. For example, public hospitals receive government funding to provide services to public patients; however, they commonly supplement revenue by offering fully private services to private patients (Duckett & Willcox, 2015).

**Figure 8**

*Number of Victorian public acute care hospitals by size*



*Note:* The Australian Institute of Health and Welfare (AIHW) differentiates hospitals by peer groups, with the 2011-12 classifications reflecting hospital size by average bed numbers. From Australian hospital statistics 2012-13. Appendix C: Public hospital peer groups, 2013 ([aihw.gov.au/getmedia/52244d6a-1f44-4f52-a20f-16c90951cc81/16772-apc.pdf.aspx](http://aihw.gov.au/getmedia/52244d6a-1f44-4f52-a20f-16c90951cc81/16772-apc.pdf.aspx)). In the public domain.

Victorian public hospital funding is administered under agreements between the Australian federal and Victorian state governments (AIHW, 2020a). For example, the

current Australian Government National Health Reform Agreement specifies an activity-based system with funding based on the estimated cost of typical hospital activities (AIHW, 2020a). The public hospitals covered by this agreement are an essential component of the healthcare system, with Australians provided with fee-free hospital care when admitted as public patients (AIHW, 2020a). Victoria has fifty regional acute-care public hospitals among Australia's healthcare services, with this category of public hospitals providing the context for this research project (Figure 8 & Appendix E).

### **3.4 Hospitals Participating in this Research**

The selection process and happenstance resulting in the inclusion of two inner regional small/medium-sized hospitals in this study are outlined in the methodology chapter (Chapter 4). The following subsections briefly describe the individual characteristics of the five de-identified hospitals participating in this study (3.4.1 - 3.4.5).

#### **3.4.1 Case hospital A**

Hospital A is a large/referral inner regional public hospital in Victoria (ABS, 2016; AIHW, 2013). It is the main referral hospital within its State government region and serves a population of over 100,000 people (ABS, 2021). The hospital is part of a multi-campus healthcare service provider, which offers a comprehensive range of healthcare disciplines and specialist services, including medical imaging and physiotherapy. The executive management structure at the hospital consists of a Chief Executive Officer (CEO) and eight subordinate executive directors. During the data collection stage of this study, 32 radiographers, 12 sonographers and 39 physiotherapists worked at this hospital.

#### **3.4.2 Case hospital B**

Hospital B is a medium-sized inner regional public hospital in Victoria (ABS, 2016; AIHW, 2013). The hospital is one campus of a healthcare service covering two rural communities with a combined regional population of 12,000 people (ABS, 2021). The hospital offers a range of healthcare and specialist services, including short-term inpatient hospital stays for midwifery, surgery and treatment of acute illnesses. In addition, a range of allied health services is available, including medical imaging, physiotherapy, occupational therapy, oncology, palliative care, diabetes education, dietitian services, podiatry and speech pathology. The executive management structure at the hospital consists of a CEO and six subordinate executive directors. During the data collection

stage of this study, two radiographers, two sonographers, and five physiotherapists worked at this hospital.

### **3.4.3 Case hospital C**

Hospital C is also a medium-sized inner regional public hospital in Victoria (ABS, 2016; AIHW, 2013). Again, the hospital is one campus of a dual-campus healthcare service; however, covering a single rural community serving a regional population of fewer than 10,000 people (ABS, 2021). The hospital offers a range of healthcare and visiting specialist services, including short-term inpatient hospital stays for midwifery, surgery and treatment of acute illnesses. In addition, a range of allied health services is available, including medical imaging, physiotherapy, occupational therapy, pharmacy, pathology, audiology, podiatry and speech pathology. The executive management structure at the hospital consists of a CEO and four subordinate executive directors. During the data collection stage of this study, two radiographers, two sonographers and four physiotherapists worked at this hospital.

### **3.4.4 Case hospital D**

Hospital D is a large outer regional public hospital in Victoria (ABS, 2016; AIHW, 2013). It is the main hospital within its State government region and serves a population of over 45,000 people (ABS, 2021). The hospital is one campus of the healthcare service provider, which offers a comprehensive range of healthcare disciplines and specialist services, including medical imaging and physiotherapy. The executive management structure at the hospital consists of a CEO and six subordinate executive directors. During the data collection stage of this study, 12 radiographers, four sonographers and nine physiotherapists worked at this hospital.

### **3.4.5 Case hospital E**

Hospital E is a small public hospital in an outer regional location in Victoria (ABS, 2016; AIHW, 2013). The hospital is one campus of a healthcare service covering six small rural communities with a combined regional population of fewer than 7,000 people (ABS, 2021). The hospital offers a range of healthcare and specialist services, including short term inpatient hospital stays for surgery and treatment of acute illnesses. In addition, a range of allied health services is available, including medical imaging, physiotherapy, occupational therapy, diabetes education, dietetics, maternal and child health, podiatry and speech pathology. The executive management structure at the hospital consists of a

CEO and six subordinate executive directors. During the data collection stage of this study, two radiographers, two sonographers and four physiotherapists worked at this hospital.

### **3.5 Allied Health Professions in Australia**

The final section of the context chapter provides a brief background of the allied health professions participating in this study. Healthcare occupations are represented by numerous professions, each with specialised training, distinct work practices, and a different ethos regarding how their profession interacts with society and the public. Furthermore, healthcare workers' division of labour has altered in recent decades, with increasing specialisation in some professions, such as medicine, nursing, and medical imaging (Duckett & Willcox, 2015). Finally, changes in government regulation have attempted to control costs, reform healthcare, and curb the medical profession's control. One such regulatory change by the Australian federal government in 2009 was the establishment of the Australian Health Practitioner Regulation Agency (AHPRA), which centralised the national registration of many healthcare professions (Willis et al., 2020).

Allied health professionals play a critical role in healthcare, supplementary to medical and nursing practice. In hospital settings, allied health professionals provide diagnostic and therapeutic services in diverse disciplines, including medical imaging (radiography and sonography), physiotherapy, audiology, occupational therapy, podiatry, social work and speech pathology. In addition, allied health professionals accept personal responsibility for maintaining the specialist knowledge of their profession (Quinn et al., 1996; Richardson, 1999). A historical overview regarding the professionalisation of the allied health professions participating in this study follows (subsections 3.5.1 - 3.5.3).

#### **3.5.1 Radiography**

The accidental discovery of X-rays by German scientist Wilhelm Rontgen in 1895 became a globally significant finding for medical science. The person who produced the first X-ray images in Australia is arguable, with three likely contenders being Sir. Thomas Lyle, Walter Filmer, and Father Joseph Slattery (Smith, 2009). These scientists were interested in electricity and photography, allowing them to assemble rudimentary X-ray equipment based on the descriptions provided in newspaper articles. Furthermore, other scientifically minded people quickly found medical applications for this technology, and



the X-ray equipment of Walter Filmer continued to operate at Newcastle hospital for fourteen years (Smith, 2009).

Early radiography involved images created by focusing X-rays through the body directly onto film inside a holding cassette; however, technological developments resulted in fluorescent screens that improved image quality and required less radiation. During World War I (1914-1918), the Red Cross Radiology Service director, Marie Curie, reasoned that X-rays could save soldiers' lives by visualising broken bones, bullets, and shrapnel. As a result, she was instrumental in developing mobile X-ray units transported in modified cars. Further technological developments included computerised digital imaging being implemented in the 1970s, improving the quality of angiographic imaging of blood vessels and paving the way for Computed Tomography (CT) scanners. In the following years, conventional X-ray systems upgraded to digital technology, resulting in radiation dose reductions and higher-quality images. In addition, networked computers have improved image accessibility and allowed image archiving for later retrieval.

The profession related knowledge of early radiography was primarily provided through research and evidence from other disciplines, including medicine and physics (Decker & Iphofen, 2005). However, in Victoria, the Royal Melbourne Institute of Technology (RMIT) trained radiographers from 1928 onwards, providing lectures in physics, anatomy and X-ray practice (Baird, 1992). In 1950 the Conjoint Board of the Royal Australasian College of Radiologists (RACR) and the Australian Institute of Radiography (AIR) was formed. This composite board of radiologists and radiographers was responsible for training standards and examinations for radiography and radiotherapy courses. However, in 1986, the Conjoint Board was replaced by the Professional Accreditation and Education Board (PAEB), making the radiography profession solely responsible for radiographers' education policy and accreditation. In addition, at that time, RMIT provided the first university degree for radiographers in Australia, with the other Australian States implementing this change in subsequent years. The introduction of degree programs saw vocational training for radiographers replaced by a program of study in keeping with university and professional ideologies:

The fundamental philosophical change in the degree program was to educate the undergraduate student in the medical radiations profession instead of training the undergraduate student for employment in a narrowly defined occupational field (Baird, 1992, p. 407).

From July 2010 onwards, the Australian federal government required national registration for ‘medical radiations practitioners’, including diagnostic radiographers, with supervised practice governed by the Medical Radiation Practice Board of Australia (MRPBA). As of March 2021, there were 14,822 registered diagnostic radiographers in Australia, with 3,503 practicing in Victoria (MRPBA, 2021). Radiographers today assist in a diverse range of diagnostic imaging techniques and may utilise a range of modalities, including x-ray, computed tomography (CT), digital subtraction angiography (DSA) and magnetic resonance imaging (MRI).

The MRPB approves accredited programs for radiography qualifications to ensure that education providers provide students with the knowledge, skills and attributes to practice competently as radiographers. Victorian radiographers must also hold a ‘radiation use licence’ to operate X-ray equipment legally. The CPD registration standard for medical radiation practitioners (radiographers and radiotherapists) was revised in December 2015. It required radiographers to complete 60 hours of CPD per triennium (three-year period) to maintain their registration. In addition, at least 10 hours of CPD must be completed annually, with 35 hours each triennium being ‘substantive’ or practice-related (MRPBA, 2022). The MRPBA dictates that CPD should be self-determined by each practitioner, responsible for planning their CPD activities based on a balanced self-assessment of their skills and knowledge.

### **3.5.2 Sonography**

Ultrasound applications used in healthcare built on successive technological advances, beginning in 1880 with French physicist Pierre Curie’s discovery of the piezoelectric effect. The discovery found that certain crystals converted electrical energy into sound waves and vice versa, allowing transmitting and receiving sound. The same technology was used to detect submarines, and in 1915, Dr Paul Langevin developed sound navigation ranging (SONAR) as used in World War II naval warfare (Baker, 2005). From the 1950s onwards, the principles of sonar were exploited for diagnostic medical imaging, with research conducted in countries including the USA, the UK, Europe, Japan and Australia. Subsequently, in 1959 the Commonwealth Acoustic Laboratories (CAL) in Australia established an ultrasonics research institute comprising a team of physicists, engineers and clinicians. Commercial ultrasound equipment has been available in Australia since the mid-1970s, and early operators were usually nurses or radiographers. The ultrasound equipment companies provided several days of nominal training for

proposed equipment users (Hassall, 2007). However, the growing use of ultrasound created the need for a significantly increased workforce with the skills to undertake specialised ultrasound scans.

The medical profession dominated the early history of ultrasound in Australia. Originally the Australian Society for Ultrasound in Medicine and Biology (ASUMB) was established in 1970. Subsequently, the group changed its name to the Australasian Society for Ultrasound in Medicine (ASUM), representing medical practitioners performing ultrasound studies. The diversity of doctors from different disciplines involved in ultrasound prompted the establishment of a Diploma of Diagnostic Ultrasound (DDU); however, this was only available to medical practitioners, requiring only self-directed learning and no tuition. Furthermore, before 1994, medical practitioners with full membership of ASUM had little regard for the accomplishments of sonographers (Hassall, 2007). However, this entrenched and contentious viewpoint was supplanted at the ASUM's 1994 Annual General Meeting, when members decided that sonographers should be acknowledged as full members of the professional body. Therefore, medical practitioner members recognised sonographers as competent professionals.

The Australian Sonographers Association (ASA) was established in 1992 to form a professional body that exclusively represented sonographers' interests, with their first National Conference held in Sydney in 1994. In the following years, ASA membership grew until, in 2012, approximately 70% of the profession had enrolled as members. Furthermore, the association implemented a strategic plan from 2012 to 2015 which emphasised activities that advanced the profession, including instituting a code of professional conduct and competency standards for sonographers. In 2014, the association's name was changed to the Australasian Sonographers Association to recognise the growing numbers of New Zealand members. In addition, several professional development initiatives were introduced, including webinars, online learning, and an ASA peer-reviewed journal.

Furthermore, the Australian Sonographer Accreditation Registry (ASAR) was established in October 1994 and is responsible for the accreditation of academic programs. In addition, the registry maintains details of accredited sonographers and monitors the CPD of the professions' members. The establishment of the ASAR profoundly affected sonographers' education because university graduates received professional recognition.

The allied health disciplines of radiography and sonography are historically linked. Many staff already working in medical imaging practices can satisfy the clinical placement requirements of ultrasound postgraduate degrees more simply than people trying to enter the profession from other backgrounds. Additionally, the profession related knowledge often extends radiographers' pre-existing knowledge and skills. However, Australian government, health professions, and employers now recognise the specialised knowledge and skills required, affirming that sonography should be a discrete profession.

The first university-based education course for sonographers was offered in 1979 by New South Wales Technical and Further Education (TAFE) and was only 15 hours in duration (Hassall, 2007). However, in 1980, the RMIT established a Graduate Diploma in Ultrasonography, providing an off-campus qualification and a two-year part-time clinical placement. Today, most sonography programs approved by the ASAR are postgraduate diplomas from Australian universities (Appendix F). As of July 2021, there were 6809 accredited medical sonographers in Australia, with 1474 registered in Victoria (M. Lascelles, ASAR, personal communication, 19th July 2021).

To maintain registration, practicing sonographers in Australia must comply with an ASAR recognised CPD program, being either: ASAR's CPD program; Australian Sonographer's Association (ASA) program (PD-ASA); Australian Society of Medical Imaging and Radiation Therapy program (ASMIRT CPD); or the Australasian Society for Ultrasound in Medicine program (myASUM). These programs provide a system for documenting CPD points accrued and allocating eligible CPD activities categories.

The ASAR CPD program was revised effective January 2017, and its requirements underpin all other programs. The revisions to the program intended to simplify compliance by allowing more online and self-directed learning, and more equitable work experiences. In addition, the changes allow for a broader range of acceptable CPD activities, including formal, informal and self-directed activities relating to the practice and encourage reflective practice (ASAR, 2022).

### **3.5.3 Physiotherapy**

Much of a physiotherapist's practice requires treatments such as massage, joint manipulation and developing therapeutic exercise plans to reduce pain and increase physical mobility. However, the physiotherapists' scope of practice is not limited to treating only muscles and joints but includes the healthy functioning of systems such as

the urinary tract, vascular circulation, chest and lungs. Physiotherapy definitions often describe its contribution to physical mobility:

... services to individuals and populations to develop, maintain and restore maximum movement and functional ability throughout the lifespan. This includes providing services in circumstances where movement and function are threatened by ageing, injury, pain, diseases, disorders, conditions or environmental factors (WCPT, 2011, p. 1).

The history of physiotherapists can be traced from 19th-century origins in massage therapy to their current status as largely autonomous allied health professionals requiring a university degree for registration to practice under Australian law. By the late 19th century, massage therapy had achieved credibility as a legitimate form of physical therapy and was the predecessor to the discipline of physiotherapy (Chipchase et al., 2006). Physiotherapy became a discrete profession at the beginning of the 20th century and was dominated by women seeking respectable gainful employment while not provoking social norms (Short, 1986). Australia's strong historical links to the United Kingdom (UK) and the emigration of therapists were instrumental in developing the physiotherapy profession in Australia (Chipchase et al., 2006).

The University of Queensland first offered a Diploma in Physiotherapy in 1939, with other Australian states following their lead in subsequent years. However, government reforms implemented in the mid-1960s resulted in physiotherapy and other allied health professions moving to a university degree qualification as a requirement for registration to practice.

However, it was a legal requirement that patients be referred to physiotherapists by medical practitioners for many years, but in 1976 that requirement was rescinded, thus providing physiotherapists with full autonomy (Chipchase et al., 2006; Struber, 2003). The evolution of the physiotherapy profession in Australia has aligned with other developed countries, adhering to World Confederation of Physical Therapy (WCPT) guidelines. In response to the Australian federal government's introduction of the Health Practitioner Regulation National Law Act, 2009, states and territories introduced legislation to facilitate national physiotherapy regulation. As a result, Australian physiotherapists must maintain Physiotherapy Board of Australia (PBA) registration associated with AHPRA. In addition, the PBA approves accredited programs for physiotherapy qualifications aiming to ensure that education providers prepare students with the knowledge, skills and attributes required to practice competently. As of March

2021, there were 36,911 registered physiotherapists in Australia, with 9,050 practicing in Victoria (PBA, 2021).

The mandatory CPD requirements for professional registration as a physiotherapist includes completing 20 hours of CPD annually. Physiotherapists in Australia must maintain a portfolio of evidence, recording CPD inputs and reflective practice. In addition, physiotherapists must submit an annual declaration to the board that they meet professional development requirements (PBA, 2022). CPD activities should demonstrate maintenance and improvement in the physiotherapist's competence in their chosen scope of practice and extension of their knowledge. In addition, the PBA mandates that CPD should be self-determined and that practitioners are responsible for planning their programs based on self-assessment of their knowledge and expertise.

### **3.6 Conclusion**

This chapter provides a brief background of the Australian healthcare system and the role of Victorian public hospitals. In addition, it also delivers a brief background of the hospitals and allied health professional groups participating in this study as a prelude to further elaboration in the following chapter. Despite having a highly rated healthcare system, disadvantages persist regarding healthcare in regional communities, affecting approximately 8.3 million people who live in regional Australia (ABS, 2020; AIHW, 2020b). Disparities in health and healthcare between metropolitan and regional populations are partly due to a lack of doctors and other healthcare professionals in rural areas (AIHW, 2019b; Duckett & Willcox, 2015; Ward & Tham, 2020). These disparities compound due to risk factors associated with regional lifestyles, including higher injury rates, hospitalisation and deaths (AIHW, 2019b, 2020b).

Australia's healthcare system is a dynamic 'complex system' composed of many interacting parts (Alibrahim & Wu, 2020; Engelseth et al., 2021; Page & Zelner, 2020). For example, public hospitals are a critical component of the healthcare system and require significant government healthcare expenditures (Duckett & Willcox, 2015). However, regional healthcare still faces significant barriers despite increasing government expenditures, including increasing workloads for allied health professionals, professional isolation and reduced access to CPD (Department of Health, 2019; Tham & Ward, 2016).

This chapter provides background information regarding the Victorian public hospitals participating in this study. Among Victoria's 300 healthcare services, there are fifty

regional acute-care public hospitals. In addition, five de-identified hospitals provide the context for the study described in this thesis, and their relevant inherent characteristics are discussed. The participating public hospitals included a large/referral inner regional hospital serving 100,000 people; two medium-sized inner regional hospitals serving populations of 12,000 people and fewer than 10,000 people, respectively; a large outer regional hospital serving over 45,000 people; and a small outer regional hospital serving a regional population of fewer than 7,000 people (ABS, 2016, 2021; AIHW, 2013).

The final section of the chapter briefly describes the history and professionalisation of radiography, sonography and physiotherapy. In 2009 a regulatory change by the Australian federal government established AHPRA, centralising the national registration of many allied health professions (Willis et al., 2020). In addition, the oversight by AHPRA formalised the requirement for CPD inputs to maintain professional registration.

The fortuitous discovery of X-rays by Wilhelm Rontgen in 1895 was the precursor of modern-day conventional digital X-ray systems, CT scanners, DSA and interventional medical imaging technologies. However, the profession related knowledge of early radiography relied on other disciplines, such as medicine and physics. It was not until 1986 that the responsibility for education policy and accreditation was entrusted to radiographers (Baird, 1992; Decker & Iphofen, 2005). Today, the MRPB approves university-based bachelor's degrees and postgraduate qualifications in medical imaging, ensuring that students have the knowledge and expertise to practice competently. In addition, CPD for radiographers is now self-determined based on a self-assessment of knowledge and skills (MRPBA, 2022).

The history of medical sonography was founded on successive technological advances, beginning with Pierre Curie's 1880 discovery of the piezoelectric effect. By the mid-1970s, commercial ultrasound equipment was available in Australia (Hassall, 2007). However, the medical profession slowed the professionalisation of sonography, with doctors displaying little regard for the work of sonographers (Hassall, 2007). However, in 1994 sonographers were finally acknowledged as full members of ASUM. Australian government and professional bodies now recognise the profession related knowledge and skills required to be a competent sonographer. Today, Australian sonographers must comply with an ASAR recognised CPD program and document their mandatory CPD inputs aligned with ASAR's wide range of eligible activities.

Physiotherapy's history in Australia can be traced from the 19th-century to its current status as a largely autonomous allied health profession. Government reforms of the mid-1960s resulted in physiotherapy requiring a bachelor's degree qualification for professional registration. However, until 1976 referrals by medical practitioners were still legally required for a physiotherapist to treat patients (Chipchase et al., 2006; Struber, 2003). The Australian federal government's Health Practitioner Regulation National Law Act, 2009 saw the introduction of national physiotherapy regulations. Therefore, the PBA now oversees training, and physiotherapists must complete 20 hours of CPD annually to maintain professional registration (PBA, 2022). The CPD activities of physiotherapists are self-determined and based on self-assessment of knowledge and expertise.

Previous research studies of healthcare professionals' CPD and KM in hospitals have usually been in the context of larger metropolitan organisations. Therefore, a significant research gap exists regarding smaller hospitals and those in regional settings that may be disadvantaged by size and geographical location. In addition, there is little research exploring the learning needs of allied health professionals working in regional hospitals, where size may also affect informal on-the-job learning opportunities (Eraut, 2011). The following chapter elaborates on this study's methodology and research methods.



## 4 Research Methodology

The literature review in Chapter 2 provides the foundation for this investigation into the processes of continuous professional development (CPD) for allied health professionals and knowledge management (KM) in regional Victorian public hospitals. This chapter deals with research methodology and methods and is presented in five sections, providing an overview of the research project design. The first section (4.1) describes the underlying philosophical assumptions and the researcher's knowledge claims. In addition, it outlines the justification for hermeneutic phenomenology as the philosophical methodology. Section two (4.2) justifies the selection of embedded case studies for this research project and provides the rationale for selecting the participant groups. The following section (4.3) discusses the practical methods and describes the data collection methods of questionnaires and semi-structured interviews. Section four (4.4) discusses the analytical research techniques employed. Finally, section five (4.5) concludes by exploring the justification for this research's overall approach and methods.

### 4.1 Philosophical Assumptions

The philosophical assumptions concerned with researchers' ethical value judgments and fundamental beliefs about the world are defined as axiology. The researcher's previous experiences as an allied health professional and manager in public hospitals have influenced his axiological worldview. As a result, this personal history has induced an egalitarian stance that respects each respondent's moral right to have their experiences and opinions valued. Therefore, knowing there is a need for reflexivity ensures that the research analysis does not merely reflect his values and preconceptions. However, it is impossible to entirely free one's mind of the subconscious influences that prompted the initial choice of subject considered worthy of investigation. The researcher's relevant expertise has been a valuable guide to enquiry, his experience aiding this study.

There is little consensus in the literature regarding the definition of knowledge (described in subsection 2.2.1); however, a commonly used and informative definition has proposed knowledge as:

... a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes practices, and norms ... Knowledge exists within people, part and parcel of human complexity and unpredictability (Davenport & Prusak, 2000, p. 5).

The public hospital contexts of this research have been described previously (section 3.3); however, the implementation of allied health professionals' CPD and hospitals' KM is carried out by individual people. Therefore, the knowledge sought from the respondents in this study is subjective and socially constructed, as elaborated in the following subsections (4.1.1 - 4.1.4).

#### **4.1.1 Epistemology – constructionism**

This research explores subjective social phenomena of human behaviour, focusing on the perceptions and meaning that participants ascribe to their experiences of CPD and KM in the workplace. Therefore, the notion of a single absolute truth seems inappropriate in an individually perceived reality encompassing different meanings for each person, as each seeks understanding from their point of view. However, the theory of knowledge and justification, that is epistemology, asks, among other things; what can we know about reality, and what knowledge do we find acceptable and valid? In answer, the notion that people derive meaning from their subjective perspectives is consistent with an epistemology of constructionism and is appropriate for this research (Bonaccorsi, 2022; Creswell & Poth, 2017; Peck & Mummery, 2018).

Understanding respondents' disparate realities allow a more sophisticated understanding of the research subject. Much of the data for this research derives from familiar sources of non-inferential knowledge: perception; memory; consciousness; reason; and testimony of the participants (Audi, 2011). The participants' different understanding of the research phenomena is valued as 'multiple knowledges' that co-exist, rather than one objective truth (Guba & Lincoln, 1994). Audi (2011) holds that testimony-based information can be a valid source of knowledge because the participants are well acquainted with the phenomena. Without any evidence to the contrary, a putative assumption is that there is no reason to doubt the credibility of the participants. Thus, this research's sources of critical knowledge are the managers and allied health professionals most acquainted with CPD and KM in regional Victorian public hospitals.

#### **4.1.2 Ontology – relativism**

As previously described, this research investigates subjectively constructed meanings based on the perceptions and the social frameworks of the people that use and interact with CPD and KM systems. Each person's assumptions about the nature of the world; how they perceive reality; the kind of things that exist; the conditions of their existence; and the relationships between them are all encompassed in a philosophical ontology.

Importantly for qualitative research, ontology concerns the nature of social reality (Creswell, 2013). Whereas public hospitals provide an environmental context for this research, the knowledge and learning of interest affect people. Therefore, the subjective nature of personal knowledge and understanding supports a philosophical ontology of relativism, with each participant's reality compared to others. Furthermore, the resulting relativist knowledge also implies a more ephemeral quality, being time, place and context-dependent (O'Gorman & MacIntosh, 2015).

#### **4.1.3 Interpretivist paradigm**

This research explores subjective social phenomena of human behaviour, and therefore the notion of absolute truth is inappropriate. The philosophical foundations of this research are post-positivist, with 'knowledge claims' contextualised within the interpretivist paradigm (Creswell, 2013) (Figure 9). Interpretivism evolved from the earlier philosophy of Husserl (1981), who espoused a descriptive phenomenological approach to research enquiry. In addition, the constructivist discourse underpinning the interpretivist paradigm advocates individually subjective descriptions to expand understanding of the human experience. Contemporary forms of interpretivism can be applied to explore everyday life experiences, providing a "rich description of phenomena as concretely lived" (Finlay, 2013, p. 172). Therefore, having an overarching interpretivist paradigm for the qualitative study detailed in this thesis, hermeneutic phenomenology was suitable as the research methodology (Figure 9).

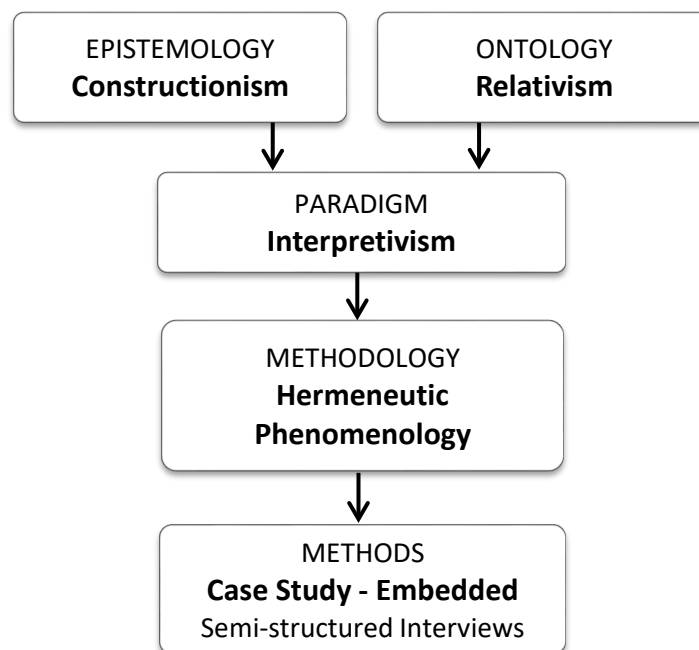
#### **4.1.4 Hermeneutic phenomenology**

The various approaches to qualitative research include grounded theory, ethnography, action research, narrative research and phenomenology. Although these disparate approaches share some commonalities, they each emphasise different perspectives and purposes. The most commonly utilised qualitative research approaches are grounded theory and hermeneutic phenomenology (Strandmark, 2015; Urcia, 2021). Grounded theory requires collecting data and developing theories inductively through an emergent iterative process (Lincoln et al., 2018). In contrast, phenomenology employs a second-order perspective to describe and interpret participants' voices as this is considered the most valuable data source regarding their lived experiences (Yates et al., 2012). The hermeneutic phenomenology guiding this study allows the search for meaning in the data and considers the time and context in which this appears. Application of this method also

addresses the paucity of studies exploring allied health professionals' CPD and KM, from study participant perspectives.

The applications of phenomenology have evolved, with successive scholars adapting the early approach of Husserl (1981). Husserl's purist phenomenology sought to establish the substantial essence of subjective experience, enabled by individuals' accurate and detailed recall regarding the object of enquiry (Flood, 2010; J. Smith et al., 2009). The practice of interpretation as a systematic activity is now known as hermeneutics and dates back to Greek antiquity, where 'allegoresis' employed non-literal interpretation of literary works (Mantzavinos, 2016). Hermeneutics initially focused on interpreting biblical texts but later expanded to include 'judicial hermeneutics' for law and 'philological hermeneutics' for literature (Ormiston & Schrift, 1990, p. 11).

**Figure 9**  
*Research Strategy*



*Note:* For this qualitative study, the philosophical foundations of constructionist epistemology and relativist ontology support an interpretivist paradigm and hermeneutic phenomenology as methodology.

Within hermeneutics, the search for explicit and hidden meaning considers the distinctive time, place and context in which it appears. Ast (1990) and Schleiermacher (1990) were influential in developing contemporary general hermeneutics, providing philosophers with universal interpretive techniques. In addition, these contributions laid the philosophical foundation for interpreting a broader range of data sources. Thus,

hermeneutic methods find more profound meaning and “understand the discourse just as well as and even better than its creator” (Schleiermacher, 1990, p. 93). Following Schleiermacher’s (1990) work, Dilthey (1990) envisioned hermeneutics as a way of understanding all forms of human expression and aspects of cognitive awareness:

Seen in the context of the theory of knowledge, logic, and the methodology of the human studies, the theory of interpretation becomes an essential connecting link between philosophy and the historical disciplines, an essential component in the foundation of the human studies themselves (Dilthey, 1990, p. 114).

Heidegger (1962) was a former student of Husserl but found pure phenomenology too theoretical and abstract, questioning whether social knowledge could be known without interpretation (Flood, 2010; J. Smith et al., 2009). He also asserted that people are so entrenched in their lived experience that social contexts and their agentic actions influence every aspect of life:

... the “hermeneutic situation” is the historically existing interpretative space at a particular time, the constellation of inherited and present understandings, insofar as it provides the possibility for a new move in the ongoing interpretation of life (Farin, 2016, p. 38).

Therefore, for Heidegger (1962) all perceptions are interpretive because people always have preconceptions about phenomena of interest (Ormiston & Schrift, 1990). In addition, self-critical reflection is necessary for hermeneutic interpretation, and an “awareness of the conditions for the possibility of systematically distorted communication” is suggested (Habermas, 1990, p. 267). Contemporary hermeneutics proffers a holistic and comprehensive interpretation, considering text and speech as “the phenomena of expression of their authors” (Romer, 2016, p. 87). In addition, modern interpretivist research investigations such as those using grounded theory, participatory action research or hermeneutic phenomenology as utilised in this study, often occur in naturalistic settings, and the research reported in this thesis meets that criteria, being conducted in the respondents’ workplaces.

## **4.2 Embedded Case Studies**

Interpretivist research encompasses various strategies and methods; however, case studies were chosen for this research and are defined as empirical enquiries investigating contemporary phenomena in real-world contexts (Yin, 2014). The contemporary phenomena under investigation within this study are CPD and KM, while the real-world contexts are allied health departments in regional Victorian public hospitals. The case study strategy is considered suitable for investigations of healthcare and practice-based

problems, where participant experiences and contexts are considered equally important (Yin, 2014). The embedded case studies in this research occurred in regional Victorian acute-care public hospitals, including small/medium and large/referral hospitals.

The context of hospital-based allied health professions may determine whether a hospital's KM efforts support or constrain an individual's CPD program. Therefore, the context may prove significant in this study, with various possible effects from organisational structure, KM approach and organisational affordances related to CPD. The reasoning that guided the selection of hospitals and allied health professions involved in this study is discussed in the following subsections (4.2.1 - 4.2.3).

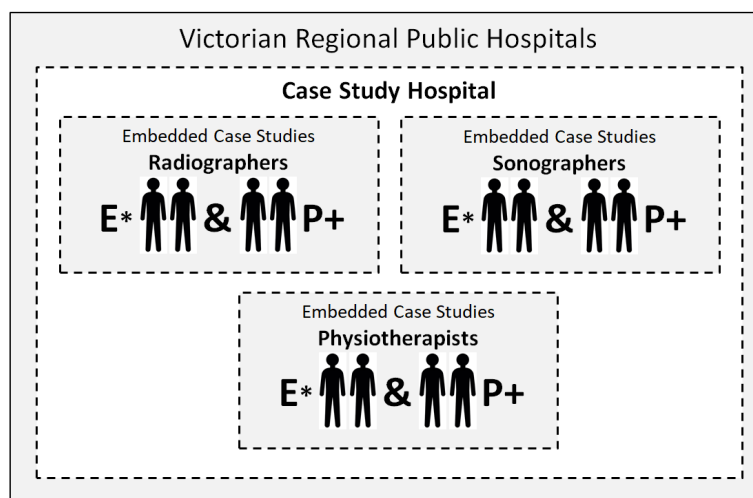
#### **4.2.1 Unit of analysis**

Defining the unit of analysis is a necessary part of case study methodology. The 'classic' case study typically focuses on a single person, the primary analysis unit (Yin, 2014). An individual focus is common in social science research; however, describing and explaining social behaviours can involve analysing collective behaviours. In addition, case study methodology can also be 'perspective focused' among people who share a common experience (Patton, 2015; Yin, 2012). This study's embedded case study design explores multiple nested units of analysis in hospital settings (Creswell, 2013; Creswell & Poth, 2017; Yin, 2003). Furthermore, embedded case studies help explore administrative and organisational phenomena.

The allied health professionals participating in this research are the primary units of analysis for the embedded case study described in this thesis because people assimilate and apply knowledge individually (described in subsection 2.2.1). Figure 10 depicts an example case study hospital set in the Victorian public hospital system, with professional groups as nested units of analysis. In addition, a dichotomy of participant expertise relating to beneficial learning styles is considered in the research design (Dreyfus et al., 1986) (described in subsection 2.4.8).

**Figure 10**

*Embedded Case Study Design*



*Note:* E = Early career (Novice to Competent); and P+ = Proficiency Plus (Proficient to Expert) denotes a dichotomy of allied health professional expertise. In addition, a maximum of two participants from each expertise level in each profession (i.e. maximum of four per profession) were interviewed at each hospital.

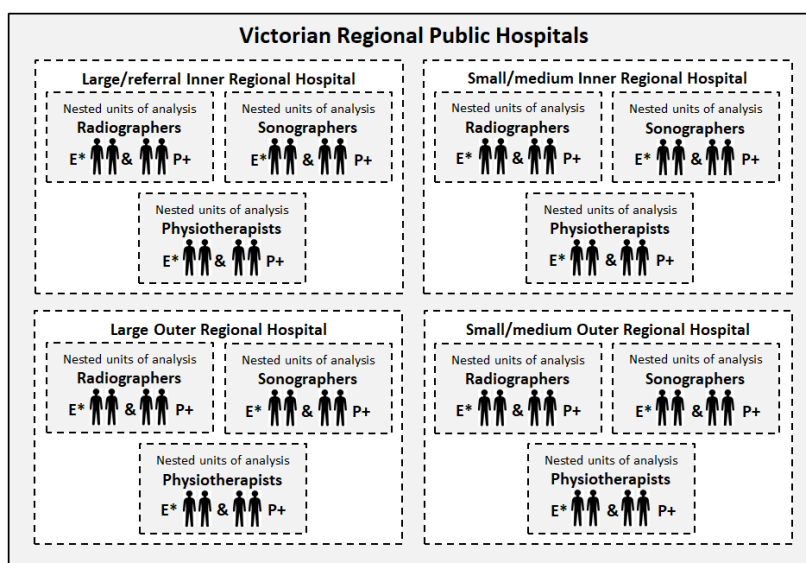
It is infeasible to include all allied health professionals working in the case study hospitals within the constraints of resources and time available for a three-year equivalent PhD study. Therefore, the study detailed in this thesis explores radiographers, sonographers, and physiotherapists' collective social behaviours. Including only these three professional groups is an acknowledged limitation of this research and reflected in the research questions. The research design criteria guided selecting these professions, proposing that the three disciplines serve as an acceptable proxy for differing practice autonomy (Chipchase et al., 2006; Eraut, 2000; McGregor et al., 2009; Sim & Radloff, 2009). However, this proposition may be subject to further investigation in future research. In addition, the managers participating in this study might influence the CPD of allied health professionals at case hospitals. Many of the goals and hospitals' KM are presumed to complement CPD processes (Rowley, 1999).

#### **4.2.2 Multi-site case study**

A further decision in case study design is whether single or multi-site cases will best answer the research questions. Therefore, the research detailed in this thesis is a multi-site case study (Figure 11) that should be more compelling and robust, allowing a more detailed analysis between different sites and professions (Patton, 2015; Yin, 2014).

**Figure 11**

*Multi-Site Embedded Case Studies*



*Note:* E = Early career (Novice to Competent); and P+ = Proficiency Plus (Proficient to Expert) denotes a dichotomy of allied health professional expertise. The multi-site nature of the case study hospitals explores dichotomies of hospital size and regional location.

The proposition being explored is that large hospitals might have more significant financial and human resources supporting CPD programs. In addition, geographical location may be significant due to increased CPD activities being available in metropolitan centres. Therefore, a stratified analysis provides richer explanations than could otherwise be achieved.

The participants for this research were purposefully selected using theoretical non-probability sampling. The participants “are not selected because they fulfill [sic] the representative requirements of statistical inference but because they can provide substantial contributions to filling out the structure and character of the experience under investigation” (Polkinghorne, 2007, p. 139). The following subsection provides a brief background of case hospitals, participants’ attributes, and their purposeful selection, depicted in Figure 12.

### **Participating Hospitals**

There are fifty regional acute-care public hospitals in Victoria (Appendix E). The Victorian government funds public hospitals, providing services dependent on community size and the Department of Health & Human Services maintains oversight of service



provision and governance of these hospitals. Regarding case hospital inclusion in the study described in this thesis, compliance with various selection criteria includes:

1. Classified as an acute care public hospital (all);
2. Employing three target professions; radiography, sonography and physiotherapy (all);
3. Classified by geographical location as regional Victoria (all);
4. Classified as either a) inner regional or b) outer regional based on distance from metropolitan Melbourne and services available utilising ASGS remoteness areas; and
5. Classified as either x) small/medium hospital or y) large/referral hospital based on hospital size according to AIHW 2011-12 classifications.

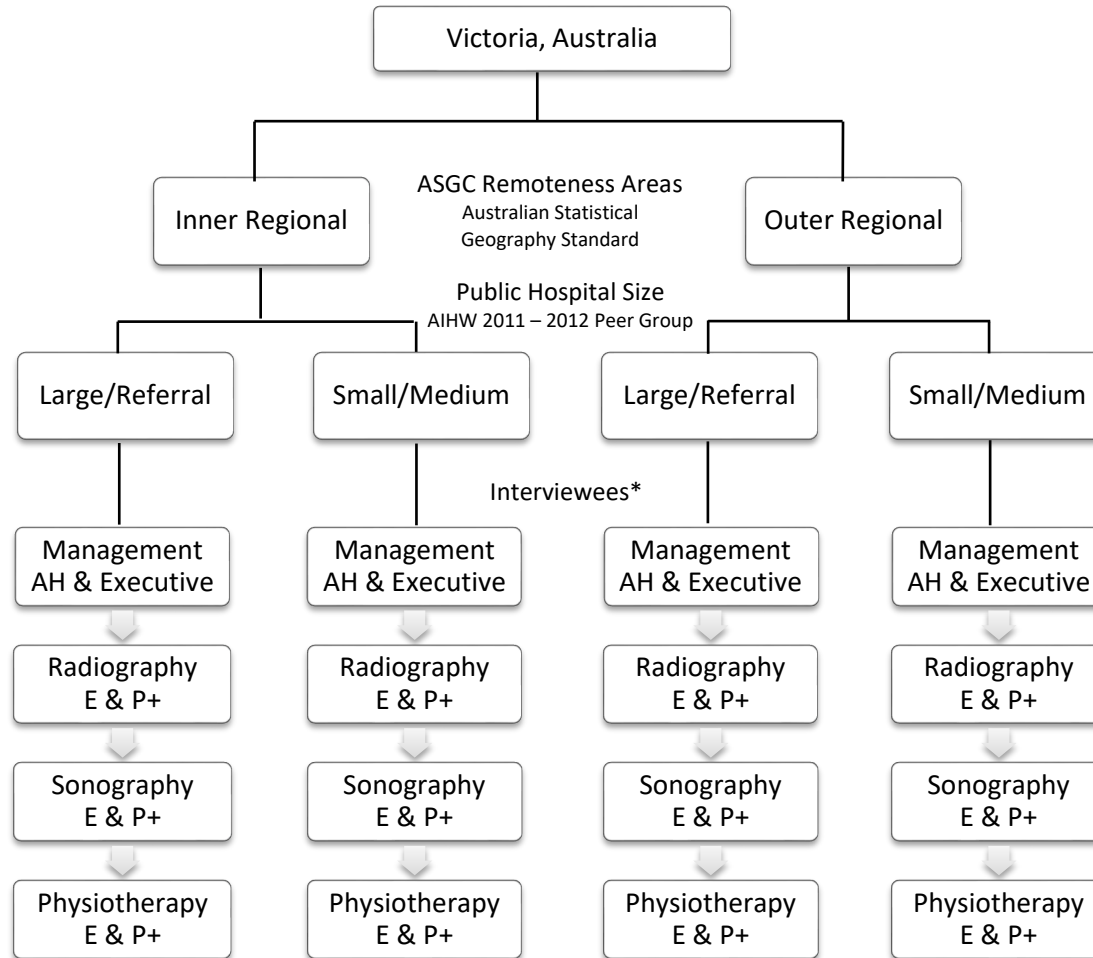
### **Regional location**

The first research design criterion concerns the classification of regionalism in Australia, with the study detailed in this thesis exploring the influence on CPD due to distance from urban centres. The regional location of the allied health professionals may affect their involvement in communities of practice (CoPs) (described in subsection 2.4.7); their access to more expert practitioners (described in subsection 2.4.8); and may also influence their planning for CPD programs (described in subsection 2.4.10).

### 4.2.3 Case selection

Figure 12

*Theoretical Non-Probability Sampling*

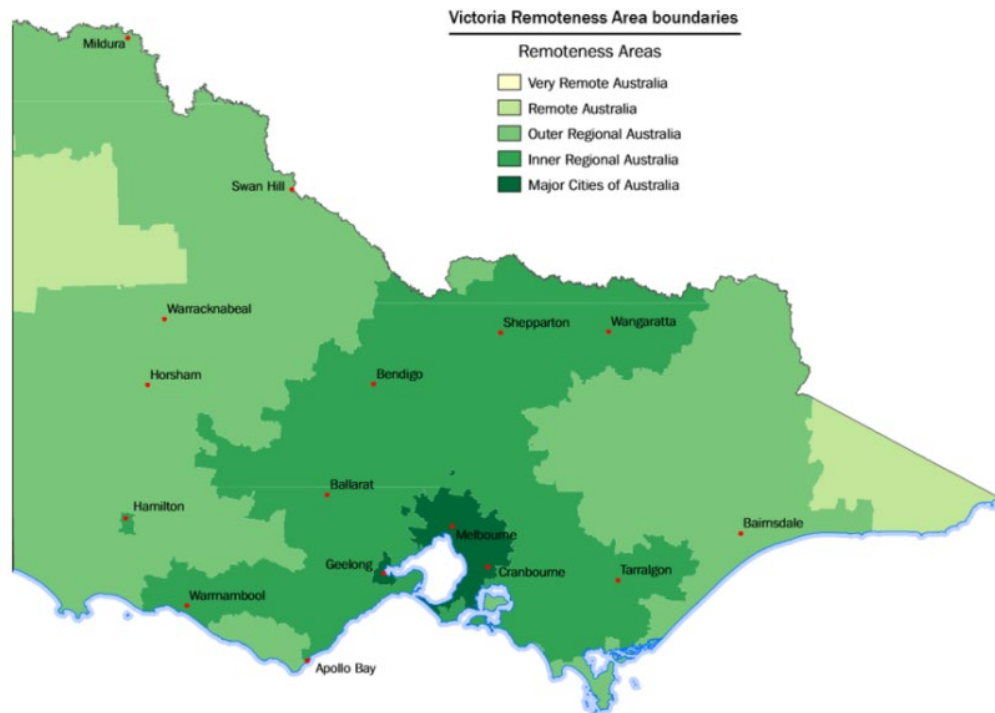


*Note:* E = Early career (Novice to Competent); and P+ = Proficiency Plus (Proficient to Expert) denotes a dichotomy of allied health professional expertise. The multi-site nature of the case study hospitals explores dichotomies of hospital size and regional location.

The Australian Statistical Geography Standard (ASGS) provides functional remoteness area categories, including major cities; inner regional; outer regional; remote and very remote areas, depicted in Figure 13. The classifications recognise distance from metropolitan cities and the availability of services in communities (ABS, 2016). However, the constraints of a PhD study limited this study's scope, thus requiring the exclusion of metropolitan, remote and very remote area hospitals.

**Figure 13**

*Victoria Remoteness Structure*



*Note.* ABS: Remoteness Structure. *Note.* Adapted from (use for adaptations) Australian Statistical Geography Standard (ASGS): Volume 5 - Remoteness Structure, 2016 ([abs.gov.au/AUSSTATS/abs](http://abs.gov.au/AUSSTATS/abs)). In the public domain.

### **Hospital size**

The second research design variable considers hospital size. The Australian Institute of Health and Welfare (AIHW, 2013) differentiates hospitals by peer groups, utilising ASGS's 2011-12 regional classifications combined with hospital size based on bed numbers (Appendix E). Therefore it is proposed that the learning opportunities of allied health professionals may be affected by hospital size (described in subsection 2.4.6).

In addition, hospital size may influence informal professional learning because of reduced involvement in CoPs (described in subsection 2.4.7) and access to expert colleagues

(described in subsection 2.4.8). Furthermore, these factors are likely to affect the availability and types of CPD activities that allied health professionals can access. Therefore, the study explores the implications of hospitals' combined geographical location and size by classifying dichotomies between inner and outer regional locations and small/medium or large/referral hospitals, respectively (Table 7).

**Table 7**

*Participating case hospital categories*

		Hospital size AIHW 2011-12 classifications	
		Small or medium (x)	Large or referral (y)
Classified regional by ASGS remoteness areas	Inner Regional (a)	Hospital B (medium) Hospital C (medium)	Hospital A (large referral)
	Outer Regional (b)	Hospital E (small)	Hospital D (large)

*Note.* Combinations of the two research design variables among the participating hospitals result in being assigned to one of four potential categories, represented in Table 7 as (ax); (ay); (bx); or (by).

Hospital size and increasing distances from metropolitan centres typically correspond with reduced healthcare services and reduced numbers of allied health professionals available to serve those communities. Applying ASGS and AIHW classifications enables answering the research questions proposed in Chapter 1. For hospitals eligible to participate in this study, the combinations of two research design variables assign hospitals to one of four potential case hospital categories. However, as shown in Table 7, Hospitals B and C are inner regional small/medium-sized hospitals. Therefore, the circumstances surrounding that occurrence require explanation.

Of the four public hospitals initially approached about being involved in this study, two provided prompt expressions of interest in participating, one hospital declined the invitation, and the fourth hospital did not respond. Therefore, it was necessary to find suitable replacement hospitals to fill the gaps in the research design. Nevertheless, replacements were identified for both hospitals; one that declined the invitation to participate and the other that had not responded. However, with the four potential case hospital categories allocated, and some months later, the hospital manager who had not yet responded finally contacted the research team, agreeing to participate. Nevertheless,

the researcher's supervisor was reluctant to discourage the hospital managers from participating in future research; therefore, the hospital was included.

### **Professions included in the study**

Various levels of professionalisation in allied health professions typically correspond with differing levels of autonomy. In addition, the degree of independent practice affects self-esteem, motivation and dedication to CPD programs (Quinn et al., 1996; Richardson, 1999; Sim & Radloff, 2009). Therefore the three allied health professions represented in this study, that is radiography, sonography and physiotherapy, serve as a proxy for the influence of autonomy (described in subsection 2.1.6). In addition, among the respondents, hospital executives and allied health managers inform contextual considerations of hospital policies and KM practices that might impact the CPD of allied health professionals.

### **Professional expertise**

The final differentiating feature for strata classification of participants identifies the most beneficial learning style associated with increasing expertise. Therefore, a dichotomy of participant expertise relating to beneficial learning styles is considered in the research design (refer to subsection 2.4.8). Learning requisites differ between early career professionals who need greater access to explicit knowledge and more experienced professionals who benefit most from exposure to tacit knowledge sharing with expert colleagues (Benner, 2004; Dall'Alba & Sandberg, 2006; Dreyfus & Dreyfus, 1980; Dreyfus et al., 1986). However, the proposition to be tested is that allied health professionals in small regional hospitals may not have adequate access to collegial work to meet their learning needs. These professional members have information-rich roles in the processes of CPD and KM as related to their department in each hospital.

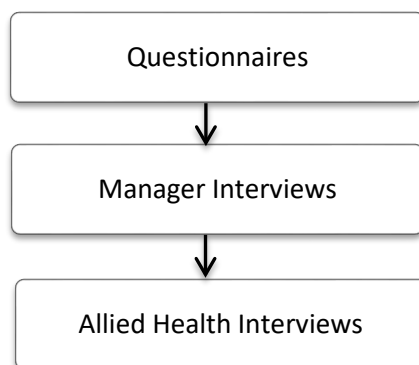
## **4.3 Methods**

Background information to determine hospitals' and allied health professions' suitability for inclusion in the research study was available in pre-existing online documents published by hospitals, professional associations and government departments. Much of this information was open-access and Internet-based. The researcher compiled a list of Victorian regional acute public hospitals appropriate for this study, meeting the case hospital inclusion criteria. Hospitals meeting those criteria were then purposefully selected for inclusion in the study. Hospital executives' personal assistants were initially

contacted by phone, with meetings organised with CEOs when that was their preference or otherwise contacted by e-mail using contact details provided by personal assistants. As discussed previously, five regional Victorian public hospitals agreed to participate in this research project. Each of the hospitals' Chief Executive Officers provided letters of support, including information required for ethics approval.

**Figure 14**

*Data Collection Methods*



*Note:* The researchers deemed questionnaires and semi-structured interviews to provide the most useful data types in ensuring the research questions are answered.

Numerous data collection methods are available when using a qualitative research strategy and case study methodology. Semi-structured interviews have been utilised for several decades and are one of the most frequently used and successful data collection methods in qualitative healthcare research (Gill et al., 2008; Holstein & Gubrium, 1997, 2016). Personal one-on-one semi-structured interviews were selected as the primary data collection method for this research as they allow the presentation of the participant's voices to be prominent in collected data and subsequent analysis (Figure 14). In addition, the combination of questionnaires and interviews will provide answers to the research questions (refer to section 1.1).

#### **4.3.1 Ethics approval (June 2016 – February 2017)**

Before the study described in this thesis could begin, it was necessary to gain ethics committee approval. In addition, this research was conducted in Victorian public hospitals and therefore required approval by a second ethics committee:

1. Austin Health Human Research Ethics Committee (HREC)  
Reference Number: HREC/16/Austin/483  
Approval date: 23 January 2017

2. Federation University Australia, HREC  
Project Number: E17-001  
Approval date: 6 February 2017

Austin Health's HREC and Federation University Australia's HREC ethics requirements align with the National Health and Medical Research Council (NHMRC) guidelines. As part of the ethics approval process, preliminary documents were developed, including:

- Interview Invitation email / Managers (Appendix H);
- Invitation Presentation Script / Allied Health (Appendix I);
- Questionnaire Invitation / Allied Health (Appendix J);
- Interview Schedule / Hospital Manager (Appendix K);
- Interview Schedule / Allied Health Manager (Appendix L);
- Interview Schedule / Allied Health Professional (Appendix M);
- Participant Information Form / Hospital Managers (Appendix A);
- Participant Information Form / Allied Health Professionals (Appendix B);
- Consent Form; (Appendix C); and
- Research Governance approvals letter (Appendix N).

#### **4.3.2 Participant recruitment (November 2016 – March 2017)**

To provide insight into hospital's expectations and involvement in KM and CPD, hospital executives and allied health managers in positions relevant to this study were asked to participate via an e-mail invitation, which outlined the research and interview processes (Appendix H). The email addresses had been obtained after phone contact with each hospital's information desks and then being referred to the chief executives personal assistants. In addition, managers were provided with a Participant Information plain language information statement (PLIS) and offered the opportunity to ask questions by e-mail or telephone (Appendix A).

In contrast, allied health professionals were initially asked to attend an information session conducted by the researcher, informing them of the research and its methods. A verbal invitation to potential participants followed a scripted 10-minute presentation (Appendix I) conducted during regular staff meetings whenever possible. In addition, the researcher provided attendees with a Participant Information PLIS, and time was allowed to answer questions (Appendix B). In addition, ethics considerations stipulated that no

management representatives attended the information sessions so that people would not feel unduly pressured.

#### **4.3.3 Questionnaires (February 2017 – March 2017)**

During the information sessions, people were asked to voluntarily complete a background questionnaire requesting demographic information and a brief history of professional practice (Appendix J). A similar questionnaire had been successfully piloted during a previous Bachelor of Management honours research project exploring the CPD of physiotherapists in private practice (Schenk, 2014). In addition, an invitation to participate was included in this document. The researcher provided the allied health professionals with the option to return the questionnaire at the end of the presentation or later by e-mail.

#### **4.3.4 Semi-structured interviews (March 2017- June 2017)**

The three-year equivalent PhD study constrained interviewee numbers. Therefore, among the allied health professionals, a maximum of two early-career (five years or less experience) and two later-career professionals (greater than five years' experience) from each profession at each hospital were recruited (refer to subsection 2.4.6) (Benner, 2004; Dreyfus et al., 1986; Eraut, 2007, 2011). However, having fewer allied health professional staff employed in small and medium-sized hospitals was considered likely to reduce the expected participant numbers at those hospitals to one per category.

Initially, it was proposed to undertake up to 20 executive and allied health manager interviews with 18 expressions of interest received (Table 8). However, one allied health manager withdrew consent after being interviewed, citing anonymity concerns, and the other was subsequently unable to be contacted. In addition, the research design proposed to undertake up to 42 allied health professional interviews, and there were 42 expressions of interest. However, the study requirements of a maximum of two early-career and two later-career professionals reduced interview numbers to 26 (Table 9).

#### **Consent**

Participation in the research project was wholly voluntary, and staff were informed that declining to participate would not prejudice their employment. On the day of the interviews, participants were provided with a consent form (Appendix C). In addition, the requirements of participants' involvement were reiterated verbally, and the researcher



answered any questions that arose. Finally, willing participants were asked to sign the consent form. The form explained that information would be treated with the strictest confidence; every effort would be made to maintain confidentiality; however, it might not be possible to guarantee total anonymity because of the small sample size.

The semi-structured interviews began with preliminary predetermined questions developed from the literature review and proceeded in a conversational style for up to 60 minutes. In addition, field notes were maintained leading up to and during the interviews to document significant events and comments made by participants; these notes were accessible to the researcher throughout the research study. The interviews were conducted in private rooms at the participants' workplaces in their chosen environment. An interview schedule guided the researcher in exploring the topics (Appendices K, L & M) with research questions developed from the literature, especially where gaps were identified in knowledge. The discussions encouraged the individuals to talk about their personal experiences related to their day-to-day practice.

**Table 8***Hospital managers' interviews*

<b>Participating Hospital</b>	<b>Geographical Location</b>	<b>Hospital Size</b>	<b>Interviewee Group</b>	<b>Proposed Interviews</b>	<b>EOIs</b>	<b>Completed</b>	<b>Manager/Practitioner</b>
<b>Hospital A</b>	Inner Regional	Large/Referral	Executive Manager	2	2	2	
			Allied Health Manager	2	2	1	* 1 WDR
			<b>Total</b>	<b>4</b>	<b>4</b>	<b>3</b>	
<b>Hospital B</b>	Inner Regional	Medium	Executive Manager	2	2	2	
			Allied Health Manager	2	1	0	* 1 WDR
			<b>Total</b>	<b>4</b>	<b>3</b>	<b>2</b>	
<b>Hospital C</b>	Inner Regional	Medium	Executive Manager	2	2	2	
			Allied Health Manager	2	2	2	* 2 combos
			<b>Total</b>	<b>4</b>	<b>4</b>	<b>4</b>	
<b>Hospital D</b>	Outer Regional	Large	Executive Manager	2	1	1	
			Allied Health Manager	2	2	2	* 1 combo
			<b>Total</b>	<b>4</b>	<b>3</b>	<b>3</b>	
<b>Hospital E</b>	Outer Regional	Small	Executive Manager	2	2	2	
			Allied Health Manager	2	2	2	* 2 combos
			<b>Total</b>	<b>4</b>	<b>4</b>	<b>4</b>	
<b>Grand Total</b>				<b>20</b>	<b>18</b>	<b>16</b>	

*Note:* The table details participant categories of executives and allied health managers with the initially proposed interviews, expressions of interest (EOIs) and the number of interviews completed. WDR = withdrawn. 'Combos' indicate interview categories of people with dual roles, i.e. allied health manager/allied health professional (practitioner) roles in small/medium hospitals.

**Table 9**

*Allied Health Professionals' Interviews*

<b>Participating Hospital</b>	<b>Geographical Location</b>	<b>Hospital Size</b>	<b>Interviewee Group</b>	<b>Proposed Interviews</b>	<b>EOIs</b>	<b>Completed</b>	<b>Manager/ Practitioner</b>
<b>Hospital A</b>	Inner Regional	Large/Referral	Radiographer (Early)	2	0	0	
			Radiographer (Prof +)	2	2	2	
			Sonographer (Early)	2	0	0	
			Sonographer (Prof +)	2	0	0	
			Physiotherapist (Early)	2	5	2	
			Physiotherapist (Prof +)	2	11	2	
			<b>Total</b>	<b>12</b>	<b>18</b>	<b>6</b>	
<b>Hospital B</b>	Inner Regional	Medium	Radiographer (Early)	1	0	0	
			Radiographer (Prof +)	1	0	0	
			Sonographer (Early)	1	N/A	N/A	
			Sonographer (Prof +)	1	1	1	
			Physiotherapist (Early)	1	1	1	
			Physiotherapist (Prof +)	1	2	1	* 1 WDR
			<b>Total</b>	<b>6</b>	<b>4</b>	<b>3</b>	
<b>Hospital C</b>	Inner Regional	Medium	Radiographer (Early)	1	1	1	
			Radiographer (Prof +)	1	1	1	* 1 combo
			Sonographer (Early)	1	0	0	
			Sonographer (Prof +)	1	0	0	
			Physiotherapist (Early)	1	0	0	
			Physiotherapist (Prof +)	1	1	1	* 1 combo
			<b>Total</b>	<b>6</b>	<b>3</b>	<b>3</b>	

<b>Hospital D</b>	Outer Regional	Large	Radiographer (Early)	2	N/A	N/A	
			Radiographer (Prof +)	2	4	2	
			Sonographer (Early)	2	0	0	
			Sonographer (Prof +)	2	2	2	
			Physiotherapist (Early)	2	3	2	
			Physiotherapist (Prof +)	2	2	2	* 1 combo
			<b>Total</b>	<b>12</b>	<b>11</b>	<b>8</b>	
<b>Hospital E</b>	Outer Regional	Small	Radiographer (Early)	1	N/A	N/A	
			Radiographer (Prof +)	1	2	2	
			Sonographer (Early)	1	N/A	N/A	
			Sonographer (Prof +)	1	2	2	* 1 combo
			Physiotherapist (Early)	1	1	1	
			Physiotherapist (Prof +)	1	1	1	* 1 combo
			<b>Total</b>	<b>6</b>	<b>6</b>	<b>6</b>	
<b>Grand Total</b>				<b>42</b>	<b>42</b>	<b>26</b>	

*Note:* N/A = No applicable staff member in this category. WDR = withdrawn. Combos indicate interview categories of people with dual roles i.e. allied health manager/allied health professional (practitioner) roles in small/medium hospitals. The ‘combos’ indicated in the table identify categories where people have dual roles of manager and allied health professional (i.e. practitioner) typical in small and medium-sized hospitals. In addition, on occasions, no staff member was employed in some interview categories, whereas others elicited no willing interview participants. These shortcomings are a limitation of this research, leaving various unfilled participant categories.

## **Data Recording**

When first discussed at the information sessions regarding their possible involvement, participants were informed that the semi-structured interviews would be audio-recorded and transcribed to collect information for the research. The researcher who conducted the interviews has experience working as an allied health professional in medical imaging. Experience as an allied health professional has imbued an awareness of confidentiality regarding ethically sensitive material. Therefore, the digital recorder and hard-copy documents related to the research were stored in a fire-resistant and lockable security case while in the field. In addition, digital copies of the interview recordings were stored in password-protected computers and access to the data was limited to the researchers involved in the study.

## **Transcription**

Participant responses from semi-structured interviews generated the majority of the data for this study. Interviews were recorded using a high-quality Sony™ digital audio recorder and then transcribed into Word™ documents by the researcher or professional transcription service. A verbatim (word-for-word) interview transcription was undertaken as soon as practicable following each interview. The transcription service was subject to a strict confidentiality agreement, requiring the data to be stored securely and copies deleted once successfully provided to the researcher.

## **Data Management**

A code replaced identifiable data from participating individuals and hospitals. For example, participants' workplace names were replaced by a hospital code denoted by a letter (A to E), and a number replaced participants' names. This de-identification provided both institutional and individual anonymity. In addition, multiple digital copies of the interview data and analysed files have been made as a security measure and stored in password-protected computers. Upon completion of the study, the research data will be stored for five years in locked filing cabinets at the university, after which digital files and audio recordings will be erased and paper documents shredded.

## **4.4 Research Analysis**

The interpretivist analysis of the study used a discovery-orientated approach that influenced the whole project, from selecting a phenomenon to study, throughout the

research program and write-up of results (Spencer et al., 2003). Data reduction began with the preliminary literature review, which was formative in developing the range of themes anticipated in this research (Miles & Huberman, 1994).

The analysis in this study utilised what is variously described in the literature as thematic analysis, qualitative content analysis or framework analysis (Furber, 2010; Gale et al., 2013; Hackett & Strickland, 2018; Spencer et al., 2003; Sundler et al., 2019; Vaismoradi et al., 2016). This approach allowed the researcher to identify common themes and differences in qualitative data. The data analysis for this study was guided by an analytical framework developed from the initial themes identified in the literature review (Appendices O, P & Q). The themes identified from the literature included hospitals' KM approach, CPD activities, CPD motivation and planning, the role of competencies in reflective practice, the influence of autonomy, peer support and work structure. In addition, emerging themes were also added throughout the data collection process.

Research data collected through qualitative methods, as in this study, are often unstructured and seem unwieldy (Ritchie & Spencer, 2002). Therefore, a systematic thematic analysis was necessary to analyse the large volumes of textual data from the interview transcripts. Furthermore, it was crucial to compare and contrast the themes across multiple cases while retaining the individual's perspectives and the context of their accounts (Gale et al., 2013; Ritchie & Spencer, 2002). Thematic analytical processes involve distinct but interconnected stages; however, they are not purely mechanical processes. Although thematic analysis represents a systematic approach, it also relies on the researcher's intuition to identify meaningful connections (Ritchie & Spencer, 2002). Finally, Spencer et al. (2013) acknowledge a lack of agreement in the literature about research analysis terminology. However, they contend that it is crucial to understand basic analytical processes. Therefore, the steps described below in this research analysis include familiarisation, indexing, charting, and synthesising the data.

#### **4.4.1 Familiarisation**

The first stage of data analysis involved the researcher's immersion in the data, achieved by listening intently to the digital audio recordings of the interviews and reading the interview transcripts. Immersion in the interview data allowed the researcher to understand the main concepts discussed by the participants. Therefore, the familiarisation

process was considered vital for the successful analysis of this qualitative study (Gale et al., 2013; Ritchie & Spencer, 2002; Spencer et al., 2003).

#### **4.4.2 Indexing**

After becoming familiar with the data, the researcher coded the interviews, which required paraphrasing the text and grouping themes considered significant. This phase of thematic analysis is referred to as indexing and involves the transcripts being assessed against the draft theoretical framework to explore the fit between data and theory (Spencer et al., 2003). Next, recurring themes from the interviews were consolidated into groups and compiled into a conceptual thematic framework, allowing the data to be better organised and more easily explored (Gale et al., 2013). This part of the process was time-consuming and involved reading through the transcripts and noting the relevant themes in the draft framework. In addition, in some instances, a single passage of interview text was relevant to multiple research themes. Therefore, as the analysis progressed, the framework was progressively refined by incorporating new and emerging ideas from the interview data. This process could have been conducted using computer-assisted qualitative data analysis software (CAQDAS) such as NVivo™ (Gale et al., 2013); however, the researchers deemed such software unnecessary due to the size of the research project.

#### **4.4.3 Charting**

After indexing, data was summarised and entered into thematic charts by copying text passages from transcripts and pasting them into appropriate reference groups in Microsoft Word™ tables. However, the charting also involved abstracting the ideas hidden within the transcripts (Ritchie & Spencer, 2002). The charts were used for the researchers to assign headings and subheadings for the themes identified, drawn from the conceptual framework, research questions, and considerations about the structure and write-up of the study (Ritchie & Spencer, 2002). Visualising the data in the charts enabled the researchers to understand and interpret the data holistically, allowing the salient features obscured by the text volume to become easier to identify. Therefore, patterns among the participant responses emerged, and groups of people with common characteristics or experiences, sometimes described similar points of view or behaviour.

As described previously, the analysis in this study utilises qualitative thematic analysis (Furber, 2010; Gale et al., 2013; Hackett & Strickland, 2018; Spencer et al., 2003;

Sundler et al., 2019; Vaismoradi et al., 2016). However, qualitative researchers warn of the pitfalls of attempting a ‘quasi-statistical analysis’ with knowledge claims suggestive of being generalised to a broader population (Hoyt & Bhati, 2007; Mason, 2002; Polit & Beck, 2010):

... the ‘spreadsheet’ look perhaps further increases the temptation for those without an in-depth understanding of qualitative research to attempt to quantify qualitative data (e.g. “13 out of 20 participants said X”). This kind of statement is clearly meaningless because the sampling in qualitative research is not designed to be representative of a wider population, but purposive to capture diversity around a phenomenon (Gale et al., 2013, p. 6).

#### **4.4.4 Synthesising the data**

The final phase of thematic analysis involved synthesising the data (Spencer et al., 2003). Therefore, the synthesis phase of this qualitative research involved exploring the data and looking for salient concepts and interconnections. Reviewing the charts helped make sense of the data set holistically, requiring what Ritchie and Spencer (2002) describe as a combination of intuition and imagination. In addition, synthesis combines researchers’ and participants’ reflexive meaning, thus creating ‘second-order perceptions’ (Giddens, 1983, p. 284). Therefore, the combined perceptions involved a double hermeneutic loop that allowed the literature related to this study to be incorporated into the final analysis presented in the discussion chapter (chapter 6) of this thesis.

### **4.5 Conclusion**

This methodology chapter describes the rationale behind the qualitative research design for this research, being embedded multiple-site case study (refer to subsections 4.1.2 - 4.1.4). The chapter begins by exploring philosophical assumptions and justifying the methodological choices of the researcher. This study’s sources of critical knowledge are the managers and allied health professionals who are acquainted with CPD and KM in regional Victorian public hospitals. However, the knowledge sought is subjective and socially constructed, consistent with constructionism as epistemology and supporting a philosophical ontology of relativism. Therefore, the philosophical foundations of this research are post-positivist and contextualised within interpretivism. Hence, hermeneutic phenomenology research methodology is appropriate for this qualitative study.

The second section of this chapter explains the processes involved in multi-site embedded case studies, with the primary unit of analysis being individual managers and allied health professionals. Therefore, this study's embedded case study design explores multiple



nested units of analysis in Victorian public hospital settings (Creswell, 2013; Creswell & Poth, 2017; Yin, 2003). However, the case study approach does not produce generalisable findings but instead elicits examples that practitioners and researchers may consider applicable in similar workplace contexts (Baker & Edwards, 2012; Creswell & Poth, 2017; Mason, 2010). Furthermore, the knowledge claims of this qualitative study require 'paradigm-specific criteria' for addressing scientific rigour (Morse et al., 2002). For this research, reliability refers to the confidence in data collection and the researchers' consistency (Long & Johnson, 2000). Therefore, reliability addresses coherence between the research questions and the data collected, consistency of interview strategy, technical quality of audio recordings, transcription accuracy and a review of the analysis. In addition, accurately portraying interviewees' meaning is facilitated using verbatim quotations. Finally, analysis using a double hermeneutic loop allows exploring interview data and incorporating knowledge from the literature.

In support of the methods detailed in section three of this chapter, interviews are one of the most widely used methods of systematic inquiry in the social sciences and are appropriate for studying CPD and KM. However, rather than only being considered as a neutral conduit for information, the interviews are an active process, wherein Holstein and Gubrium (1997) "highlight the fact that interactional, interpretive activity is a hallmark of all interviews" (p. 140). In addition, utilising qualitative interviews allows a conversation between those knowledgeable and experienced in the phenomenon (Saunders et al., 2009). Finally, the semi-structured interviews provide holistic descriptions of CPD and KM, and incorporating interview quotations allows the reader to identify with respondents' perspectives (Weiss, 1994).

During the interviews undertaken in this research, the interviewer was responsible for guiding the course of the discussions toward the study's intended subject matter and judging when the respondent's answers needed elaboration (Weiss, 1994). The interview process worked within "the narrative tradition, of joint production of meaning" (Corden & Sainsbury, 2006, p. 11), whereby the researcher attempted to deconstruct and interpret each respondent's meaning. However, the conversational style of the interview resulted in them proceeding quite differently, with different levels of importance being ascribed by individual participants to the range of issues discussed. It is acknowledge that critics of qualitative interviews for data collection suggest that the personal perspectives of the interviewer can result in interview interaction bias that has potential to affect a study's

validity (Roulston, 2010). This possibility was countered through multiple data collection sites (allowing triangulation of findings) and transparent data analysis and reporting. The following chapter will present the cross-case analysis and findings from the embedded multi-site case studies in regional Victorian public hospitals.

## 5 Thematic Analysis (Findings)

The literature review regarding continuing professional development (CPD) of allied health professionals working in regional Victorian public hospital settings was presented in Chapter 2. It included three overlapping works of literature regarding the sociology of professions, knowledge management (KM) and adult education. Previous allied health CPD research has typically focused on metropolitan hospital contexts, revealing a research gap regarding regional hospital settings (Castillo & Cazarini, 2014; Sajeva & Jucevicius, 2010). This thematic analysis chapter presents the findings from embedded cases in regional Victorian public hospitals. The hospitals selected for the case studies included small/medium and large/referral hospitals, distinguished by available bed numbers (Appendix E), located in inner and outer regional areas (ABS, 2014).

A feature of this research is that investigations relate to reports from participants' experiences, including those of hospital managers and allied health professionals. Furthermore, following an interpretivist research approach (described in subsection 4.1.3), the respondent's 'voice' is considered the most valuable data source, emphasising participants' experiences and perceptions relating to their specific contexts. Therefore, this research also addresses a methodological gap in the literature related to allied health professionals' CPD from their unique standpoints.

The researcher invited regional hospital managers, radiographers, sonographers, and physiotherapists to participate in one-on-one semi-structured interviews (described in subsection 2.1.6). Initially, using N-Vivo computer software to assist with text analysis was contemplated. However, it was decided that the researcher's immersion in the data would be more comprehensive using a manual analytical process. Therefore, data from the participant interviews were captured in digital audio recordings with resulting written transcripts analysed. This approach to analysis allowed the researcher to better relate to respondents' lived experiences and develop a deeper understanding of the managers' and allied health professionals' responses.

The qualitative analysis for this research has previously been described in Chapter 4 (section 4.4). The research analysis method allowed copying and pasting verbatim passages of text into charts, with initial theme headings derived from the conceptual framework and research questions (detailed in subsection 4.4.3) (Appendices O, P & Q). The final phase of thematic analysis involved synthesising data from the charts, which

were reviewed and interpreted (described in subsection 4.4.4). The research analysis describes shared experiences and perceptions as ‘common themes’, whereas respondents’ diverging experiences and responses were labelled ‘less common’ or ‘idiosyncratic’ themes. As previously stated, the thematic analysis of this study aims to answer the following primary research question:

- What factors significantly influence the availability and effectiveness of continuing professional development (CPD) of allied health professionals (radiographers, sonographers and physiotherapists) in regional Victorian public hospitals?

The research study’s findings are structured using examples of participant responses to each subsidiary research question (detailed in subsection 1.1.1), collectively contributing to answering the primary research question. The order in which the sections in this chapter are presented includes the overall conceptualisation of CPD; motivations for CPD; responsibility for CPD; CPD activities; competencies considered necessary for good practice; hospital KM and CPD; planning CPD programs; and informal learning in regional hospitals (sections 5.1 - 5.8). The final section of the chapter briefly reiterates some of the findings in the thematic analysis including the motivations for allied health professionals undertaking CPD, aspects of hospitals’ KM and allied health professionals planning of CPD programs (section 5.9).

## **5.1 Overall Conception of CPD**

All participants were asked to discuss their broader impressions of CPD concerning allied health professionals, guided by the interview schedule prepared by the researcher. The questions related to their overall conception of CPD and the purposes of CPD activities.

The subsidiary research question to be answered in this section was:

- What understandings of CPD are held by managers and allied health professionals in regional Victorian public hospitals?

A common theme expressed in managers’ interviews related to CPD being a part of ongoing life-long or career-long learning:

To me, it [CPD] means ... that they actively pursue education as a life-long thing. Otherwise, I believe that people should be training throughout their careers to maintain their skills to keep abreast of changing trends (B1 – Executive Manager MI).

[CPD] is the process of continuing to develop yourself in your profession, and I guess also to some extent as a person and your ability to interact with patients and then have the knowledge to be able to help them achieve their goals (C4 – Physiotherapy Manager / Competent+ Physiotherapist).

The majority of managers related the purpose of allied health professionals' CPD to providing the best patient care possible. However, they acknowledged that professionals in regional locations were disadvantaged in the availability of face-to-face CPD opportunities.

The allied health professional participants perceived their undergraduate studies as simply providing a foundation of knowledge and skills:

When you've stopped uni that doesn't mean that's when you stop learning, and as this is a medical field and it's constantly evolving, you need to continually develop your professional skills and adjust with the new software and the new techniques that come out (A5 – Early Career Radiographer).

In addition, the majority of allied health professionals conveyed in their interviews that the purpose of CPD is to maintain up-to-date professional knowledge and skills. They considered that CPD should be profession-specific or related to healthcare to assist with current and future practice. Although a less common theme, some respondents proposed a more inclusive concept of CPD, encompassing all available profession related learning opportunities. A few more experienced allied health professionals suggested that CPD did not just include the formal activities typically logged as CPD points. Instead, proposing that CPD should also include informal activities such as working alongside their peers:

... the majority of what you do, even on a day-to-day basis, a lot of it could be termed CPD. It's just more the question of actually logging it and keeping a record of it that's changed more (A4 – Competent+ Radiographer).

However, despite acknowledging that CPD includes learning from everyday practice, one physiotherapist considered that the lack of a challenging caseload reduced the opportunity to learn from everyday practice in regional hospitals. Therefore, they were more dependent on formal CPD activities for their learning opportunities:

... especially being rural, it's [CPD] my way of getting better at what I do. So there is not a lot of the scenarios within a hospital out here. You are always learning from experiences because there is never anything so drastic or specialised that you are probably going to see. I have to rely on courses and online stuff, and journal articles to learn a lot (D9 – Early Career Physiotherapist).

In summary, hospital managers acknowledged that professionals in regional public hospitals were disadvantaged in the availability of face-to-face CPD activities. Notably, a few respondents proposed an inclusive concept of CPD, including all available profession related learning opportunities, including day-to-day workplace activities involving challenging and collegial practice.

## **5.2 Motivations for CPD**

The interview schedule developed for hospital executives and allied health managers began with questions about their principal reasons for expecting allied health professionals to undertake CPD activities. In contrast, the questions asked of allied health professionals included what motivated them to undertake CPD activities. The interview schedule for this part of the discussion was relevant to the subsidiary research question:

- What factors influence the planning of CPD programs undertaken by allied health professionals in regional Victorian public hospitals?

A consistent theme expressed by executives and allied health managers was that the majority of allied health professionals were highly engaged in their ongoing education without needing prompting from managers:

... not necessarily at that level of certificates and degrees or whatever, but they love to go off and do the weekend courses and that type of thing to improve their skills (C1 – CEO / Executive Manager Physiotherapy).

The allied health professionals detailed various combinations of motivations for undertaking CPD. The eight common motivations listed in this section include mandatory requirements for professional registration; patient care; maintenance and enhancement of knowledge and skills; evidence-based practice; professional advancement; satisfying personal interests; meeting hospital needs; and demotivating regional locations (subsections 5.2.1 - 5.2.8).

### **5.2.1 Mandatory CPD required for professional registration**

Managers commonly included the mandatory requirements for professional registration when asked about the main reasons they expected allied health professionals to undertake CPD. In addition, they noted that allied health professionals' ongoing employment was contingent on complying with professional registration. However, the mandatory CPD required for professional registration was not the primary motivation for many allied

health professionals in this study. Instead, many cited mandatory CPD requirements as a secondary motivation but suggested that it did provide the impetus to document CPD activities:

I'm cognisant of it [mandatory requirements], but I think I've always done probably more hours and that, so it's never really been an issue for me. Hasn't changed what I do, but I'm aware of it because we have people audited, so probably the things that's changed is the recording of what I go to or do rather than change in how much I do (A7 – Competent+ Physiotherapist).

Many allied health professionals in this study considered the government's mandatory CPD for professional registration as more challenging to achieve in their regional setting. They often cited that most formal CPD activities were held in large metropolitan centres and that travelling time made attendance prohibitive. However, many of the participants thought that compliance with mandatory requirements was also becoming more manageable due to the expanding range of eligible formal and informal CPD activities:

There are times when you do things; like you mentioned earlier, just to get the [CPD] point ... I've done it myself; I just wanted the point, and that's not the ideal way to go about things I think, and I've seen a lot of people do that as well especially in a regional practice where you don't get much option, and you're limited, you try to get whatever is out there and sometimes that's the easy way to do things (C5 – Early Career Radiographer).

When asking allied health participants about their reasons for undertaking CPD, two radiographers expressed a less commonly held viewpoint, with mandatory CPD for professional registration being their primary motivation for undertaking CPD activities:

What motivates me? I would say, well, the fear of getting audited and not having enough CPD points. If somebody says they don't fear that, then I think they're lying (C5 – Early Career Radiographer).

### **5.2.2 Patient care**

One of the common responses from management participants was that they also expected allied health professionals to participate in CPD because it contributed to the safe and effective treatment of hospital patients:

I think there's always areas to be improved on, to learn in each area that you work in and just for best patient care and patient-centred care; you want to make sure that you are providing the majority of up-to-date, relevant treatment for people to achieve their goals (C4 – Physiotherapy Manager / Competent+ Physiotherapist).

One allied health manager described CPD's primary focus as facilitating an increase in the knowledge and skills that staff needed to improve the efficacy of treatments:

... the majority of them join their profession to make a difference and having a feeling that they can make a difference and that they have a range of tools, and skills and knowledge that they can deploy with their patients (A3 – Physiotherapy Manager).

Many participating allied health professionals were also focused on improving diagnostic and treatment efficacy and identified patient care as a principal underlying motivation for undertaking CPD:

So if I can be a very skilled, very knowledgeable physiotherapist, then that puts me in a really good position to be able to provide the best outcomes for patients and to help them guide them in their rehabilitation, to be as independent as they can be (A8 – Early Career Physiotherapist).

Radiography and sonography participants indicated that high-quality patient care in medical imaging (MI) relied on a comprehensive understanding of the high-technology equipment that contributes to the patient experience and diagnostic outcomes:

... well I think in the technology side of things that you do have to adapt to, the new stuff that keeps coming along and be able to use it as best you can. That's obviously for the benefit of a patient's care and whether it's doing things more quickly and easily, therefore more comfortably for the patient or doing stuff that you couldn't previously do (A4 – Competent+ Radiographer).

One executive manager expressed an alternative view regarding patient care, preferring a more holistic, preventative approach at odds with the trend of reductionism and specialisation, which is dominant in Western Medicine (refer to subsection 2.1.6) (Rosenberg, 2002; Warner, 2014).

I suppose I see one of the important parts of allied health is to try and get a wider understanding of the whole case. I suppose it goes back to part of my concern as a bystander, which is probably as a manager in some ways you are a bystander is we just ... we've got to be careful not to just diagnose the one problem but to make sure that we have a look at it in a holistic way (A1 – Executive Manager MI).

Additionally, a few participants considered that patient care taught in undergraduate training and early career experiences were sufficient. Therefore, they did not believe that allied health professionals required further reinforcement of patient care through CPD activities:

... so that's [patient care] usually what we do in our allied health whole group in-services so patient care models and client-centred practice and evidence-based practice. All that



kind of stuff is usually on offer, and we are usually expected to participate in the majority of it, and it is important to know, but because it's hard hit into us at uni I feel like that's my foundations for practice. Working on that, I don't feel I can learn too much about that kind of stuff now (D9 – Early Career Physiotherapist).

### **5.2.3 Maintenance and enhancement of knowledge and skills**

The allied health professionals in this study have all undertaken undergraduate university degrees to enable their eligibility for Australian Health Practitioner Regulation Agency (AHPRA) or equivalent professional registration. The executive and hospital managers all expected levels of knowledge and expertise correlating to each allied health professional's years of experience:

It is the responsibility of AHPRA to get people trained and ready to start. They give us people who are supposed to be work-ready. So they come in here, we interview them based on the kind of job we want them to do, and we interview them at that skill level. Either they meet that, or they don't (D1 – Executive Manager Physiotherapy).

The executive managers interviewed came from various backgrounds, some beginning their careers in healthcare, whereas others had previous experience in business. However, regardless of managers' backgrounds, the maintenance and enhancement of knowledge and skills was a common reason they expected allied health professionals to participate in CPD programs:

I expect all of the physios to be undertaking CPD to up-skill, further the education that they've got in their undergraduate degrees and in terms of career progression, I'd like to see them up-skilling in the areas that they want to become senior practitioners in (D3 – Physiotherapy Manager / Competent+ Physiotherapist).

... it's about people keeping up to date with current trends and keeping their skill sets sufficiently of a level that they're keeping up to date with historical stuff but also what emerging trends might be and what data might be telling them (A1 – Executive Manager MI).

Some of the participants with dual roles as manager and allied health professional used their CPD programs to extend the services available to hospital clients:

I think probably because I'm relatively new in my field but I have a job where I have to supervise a lot of other people, I put pressure on myself to have more knowledge than I have gained through my clinical experience. So I am trying to make sure I am filling the gaps of our service (D3 – Physiotherapy Manager / Competent+ Physiotherapist).

The majority of allied health professionals discussed maintaining and enhancing their knowledge and skills as a good reason for undertaking CPD. In addition, more

experienced radiographers described that increasing their independence in practice was facilitated by CPD:

I think it's just important as radiographers that we just continually try and improve ourselves and don't stay stagnant in our jobs. Depending on your skill level and your independence, you can take on more of a diagnostic role, not just a button pusher (A4 – Competent+ Radiographer).

Some participants suggested that independence in practice took on greater importance in regional settings, where specialist medical practitioners were often unavailable:

That's what I wanted, and it's even more important here where we don't have a radiologist on-site. I would rather do that, study and learn rather than chasing the radiologist, so I think that would be the biggest prompt (C5 – Early Career Radiographer).

Many of the physiotherapists in this study discussed their reliance on clinical reasoning in everyday practice. They described needing to maintain and enhance knowledge, which in turn allowed more effective clinical reasoning, and enabled positive patient outcomes:

There are a lot of ways of treating people, and there's no real right way I suppose. So the more they know, the better it is, so you can give your patients options to treat them. So there's not necessarily just one type of treatment, and that's it because there are always different scenarios, different types of situations where it wouldn't work. So I suppose that's one of the reasons why I want to keep upskilling (D8 – Competent+ Physiotherapist).

#### **5.2.4 Evidence-based practice**

The majority of managers also expected allied health professionals to undertake CPD activities to increase evidence-based practice. This expectation aligned with the allied health professionals' own motivation to use evidence-based practice in their day-to-day work and to benchmark their practice against that of others:

There's no point doing it because you think it's good or because someone says that's the way it's always been done. You need to do it based on the evidence (E3 – MI Manager / Competent+ Sonographer).

... in this industry, you've got to keep up with the Joneses. Like how much CT... for me because that's my baby ... how much of that has changed for me in my career is unbelievable (D4 – Competent+ Radiographer).

Regardless of their level of experience, the physiotherapy participants generally considered evidence-based practice to be critical, requiring knowledge of current evidence and contemporary treatment techniques:

... plays a huge role to ensure that you've got current techniques, current evidence because it is regularly changing, and certainly a lot of the current evidence shows that practices that people did 20 years ago aren't perhaps the best way to go about it (E8 – Early Career Physiotherapist).

... you could say that evidence-based practice is best-practice. With your clinical reasoning, you will take on board what the evidence says and process that because lots of situations are different. But certainly, by staying up-to-date with changes, you're keeping your finger on the pulse for what works best for people (A6 – Competent+ Physiotherapist).

Encouraging evidence-based practice was a significant reason why managers and allied health professionals supported CPD programs; however, many physiotherapy managers considered that their profession had too little evidence supporting practice:

I think physios are very aware of evidence-based practice, and they'll want to know that what they're learning is evidence-based. So the courses themselves will talk about the evidence backing it, certainly (D3 – Physiotherapy Manager / Competent+ Physiotherapist).

An acknowledged deficiency in evidence-based practice required the physiotherapists to appraise evidence in a hierarchy before judging which treatment was justified:

I mean that was definitely something that was very big at Uni was to sort of also appraise the quality of evidence. I think that's always important to take into consideration. Probably don't always methodically go through it as you did in Uni to sort of see how well done the evidence or the clinical trial was done (D10 – Early Career Physiotherapist).

Many of the physiotherapists also discussed their need to act with autonomy regarding assessment and treatments, increasing the reliance on their input in evaluating the available evidence for clinical reasoning and practice:

... you've got to evaluate everything and to make that, what's the term, 'evidence-informed decision'. So the part of the clinical reasoning is the evidence-based practice and experience and all of these other areas that you get knowledge from, and you've got to decipher all of that to make an informed decision (A6 – Competent+ Physiotherapist).

The MI participants (radiographers and sonographers) also described efforts to benchmark current techniques against the evidence in the literature. However, their efforts to apply evidence-based practice can be curtailed by members of the medical profession, who may preference their expert medical opinion instead of research findings:

I've got to go on with what I am directed to do. It's part of being a mature professional, you don't get your own way all the time, even if you can back it with evidence. Quite often, there is conflicting evidence (E7 – Competent+ Sonographer).

## 5.2.5 Professional advancement

When executive managers and allied health managers discussed why they expected allied health professionals to undertake CPD activities, a common response was encouraging domain specialisation, sometimes including attaining credentialed qualifications:

... in my career, I've seen the emergence of a Grade 3 role and a Grade 4 role, and so it's also about protecting the integrity of those positions too, that really if someone's working and that level of autonomy and independent thinking that's required at that really top level, you need to have evidence, you need to have a credential, and it had a process of being deemed competent and credentialed to work in that top-level (B2 – Executive Manager Physiotherapy).

However, the suggestion from managers was that professional advancement should not be limited to domain specialisation within the original field of practice but should include future leadership or managerial roles:

But the grade 3's ... the things that they struggle with and the things that they want to develop their skills in are more around leadership; things like engagement, service reviews, influencing people, conflict management, the whole suite of things involved in leadership (A3 – Physiotherapy Manager).

The allied health managers generally acknowledged that allied health professionals prefer to seek domain specialisation; however, their support to facilitate professional advancement was typically contingent on benefiting the hospital:

But obviously, particularly in a regional area, sometimes you can't specialise too much, and you have to retain a breadth of knowledge in certain areas, and certainly in even smaller places they talk about generalist specialists (A3 – Physiotherapy Manager).

When asking allied health professional participants about their motivations for undertaking CPD activities, common responses included seeking domain specialisation and professional advancement as an impetus for the specific CPD they had undertaken:

I kind of had this thing where you don't want to be a stock standard radiographer these days, you want to be something a bit different, you want to be something a bit special so you can sell yourself; so that if and or when you choose to move on, you're actually a bit more than the average radiographer so that people take a bit more of a notice of you (D4 – Competent+ Radiographer).

However, many participants also spoke of difficulties selecting a preferred specialisation when entering the profession. Early career physiotherapists had the opportunity to rotate through the different specialisations, which ultimately helped in their career choices:

So having had three years of experience as a rotational grade 1 physiotherapist, I have taken several rotations in acute neuro, community rehab neuro and the subacute patient rehab neuro. So I've had quite a bit of exposure which has been really lovely. But I am getting to the part of my career now where I do know that's my passion and that I'd love to do that full time and that I am starting to look for opportunities where I can (A8 – Early Career Physiotherapist).

Another limitation experienced by some allied health professionals was being able to achieve domain specialisation. This included opportunities to specialise not being available in smaller regional hospitals: "... if you want to specialise, we don't have that opportunity here like bigger hospitals do. So I think that does impact on our retention as well" (E4 – Physiotherapy Manager / Competent+ Physiotherapist). In addition, not all management participants supported allied health professionals' specialisation. For example, hospital managers in all but the largest hospital preferred recruiting generalist practitioners:

We don't have that capacity for them [physiotherapists] to specialise here but they can choose a pathway for specialising either for future use or sparingly for professional practice here. But we don't have that support network within the hospital or capability to specialise them (D1 – Executive Manager Physiotherapy).

When physiotherapy managers discussed being a 'specialist generalist', they described them as competent in two or three traditional specialties. Examples provided for specialties included early intervention in orthopaedic surgery and aged care. In addition, the managers expected all physiotherapists to have sophisticated problem-solving skills and systems thinking, being mindful of the resources available in their regional context. However, in some of these hospitals, managers capitulated and supported more specialised CPD to assist with the current recruitment needs of the hospital, sometimes at the expense of long-term retention of staff:

It's difficult, because the physios want a specialist stream but our model doesn't fit that. I know that's where they want to go, I know that their thinking I'm a Grade 1 rotational therapist, I want to end up as a rehab Grade 2. So I know that's where their career wants to head so we try to facilitate that as best we can because if they're not getting it here they're going to go somewhere else (D3 – Physiotherapy Manager / Competent+ Physiotherapist).

Another alternative theme that emerged from the interviews concerned one allied health manager placing equal weight on the current training needs of the allied health professionals and potential future employment opportunities for their staff:

I feel like it's more like you're looking after the person as well because for that person it's fine, you're working in the country, and you don't need to do anything really spectacular

... but if you want to go back to maybe the city or something and you have to compete with people that's been in that competitive environment all the time, if you're not being able to stand on the same level as them, then you're not going to get a job (C3 – MI Manager / Competent+ Radiographer).

In summary, managerial support to facilitate professional advancement typically depends on a perceived benefit to the hospital. In addition, the responses from some allied health managers suggested they expected the employment of allied health professionals would often be short-lived, and management decisions would not affect retention outcomes.

### **5.2.6 Personal interest**

When asked about the main reasons their staff participated in CPD activities, common responses from managers included the expectation that allied health professionals would focus on topics that interested them:

I think all of our strategies are guided by their interest. If someone develops that interest, and from a management point of view, if there is a market for it here, we are serviced by that; we allow that interest to grow as far as is possible (D1 – Executive Manager Physiotherapy).

Hospital managers encouraged people to pursue their interests. However, support for CPD activities was frequently conditional on the personal interest of allied health professionals aligning with hospitals' service needs:

I do have the reservation that when the staff is only interested in something that doesn't have any relevance to their current clinical practice, we don't tend to be disposed to that (D1 – Executive Manager Physiotherapy).

Many of the allied health professionals also described personal interests changing throughout their career and CPD aligning with their interests at the time:

Personal interest, and just the feeling that I can see that the industry changes all the time and you've got to keep up with it, you've got to know the technology, you've got to know the techniques and know different styles and different ways of doing it (D4 – Competent+ Radiographer).

In summary, managers and allied health professionals all expected that CPD activities would focus on topics of personal interest. Hospital managers encourage people to pursue interests that correlate with their caseload. The allied health professionals' accepted this conditional support describing their interests changing as their careers progressed.

### 5.2.7 Hospital needs

During discussions about why staff participate in CPD activities, managers described the need to ensure that staff have the knowledge and skills to deliver safe, effective patient services. Therefore, CPD was proposed to increase evidence-based best practice, resulting in safer and more effective healthcare. Many of the executive managers also talked about hospital accreditation as an opportunity to demonstrate the hospital's support for CPD programs to government oversight:

... accreditation can be a bit over-rated; a bit of tick-and-flick ... I think from an assessor's perspective, if I was coming to a health service I'd want to know that we were interested in CPD; that they [allied health professionals] were encouraged to do CPD (B1 – Executive Manager MI).

CPD and professional advancement were always encouraged and supported by managers when they aligned with hospital service needs. For example, the radiographers who wished to specialise in sonography commonly discussed the alignment between their interests and hospital needs as the impetus to study:

So we generally, at any one time, will have a sonographer who is a radiographer, and we have one at the moment who is more than halfway through. So we are actively looking for the next one to come on board and continue the training, and that is supported by the hospital as well financially (D2 – MI Manager / Competent+ Radiographer).

The allied health professionals also provided examples of the need for alignment between hospital goals and preferred CPD activities before support was forthcoming:

So if our PD plan doesn't align with all the things that they would like to achieve as well, chances are you would be told, 'no, we don't want you to do that'. Like because, early last year I wanted to do the hydrotherapy course, but because they weren't wanting to do hydrotherapy, they turned that one down (D9 – Early Career Physiotherapist)

Although an exception to the general degree of alignment required with hospital needs, one executive manager had established performance targets and a 'dashboard' report of efficiency and effectiveness measures to maximise the benefits of CPD to the hospital:

...for their own professionalism and for our disciplines to improve towards the goals of the directorate, which are achieving our targets, providing the best and safe quality care for patients and maximising our EFT and the technologies that we can use (A2 – Executive Manager Physiotherapy).

In summary, all executives and allied health managers wanted to ensure that staff had the knowledge and skills to deliver safe, effective patient care. Therefore, CPD that increased evidence-based best practice was typically supported.

### **5.2.8 Regional location demotivating**

When questioned about their motivations for undertaking CPD activities, a few allied health professional participants said that regional location and smaller hospital size affected their motivation to undertake CPD. In addition, two radiographers suggested that their regional location was demotivating:

... just because you're regional, I think you kind of ... slack off, because you don't have that peer pressure you know in a big department or a hospital, you don't have your peers going to all the conferences (C5 – Early Career Radiographer).

To summarise this section, the exploration detailed why executive and allied health managers expected their staff to undertake CPD activities and allied health professionals' numerous motivations for undertaking CPD. The following section will examine the respondents' perceptions regarding moral and legal responsibility for participating in CPD programs.

## **5.3 Responsibility for CPD**

All participants, including executives, allied health managers and professionals, were encouraged to discuss who bore responsibility for professional development. In addition, the interviewees were asked about the level of involvement they expected allied health professionals, hospitals and professional associations to have in CPD programs. The responsible parties listed in this section were common themes among the respondents and include allied health professionals (subsection 5.3.1); hospitals (subsection 5.3.2); and professional associations (subsection 5.3.3)

### **5.3.1 Allied health professionals are primarily responsible for CPD**

The interview respondents unanimously believed it was individual allied health professionals who were morally obliged to manage their CPD programs:

I see that there is a commitment and accountability to the word 'continuing'; as long as you're providing a service to the client and evidence is always changing in that space, for a practitioner not to continue to be actively developing herself/himself, I see that would actually be not fulfilling the obligation of the health professional (C2 – Executive Manager Physiotherapy).



One executive manager's background in accountancy and finance was formative in the assumption that members of all professions inherently questioned their current practice and looked for ways to achieve better outcomes:

So I suppose I take it the same as what it means in the finance base and background; it's about people keeping up to date with current trends and keeping their skill sets sufficiently of a level that they're keeping up to date with historical stuff but also what emerging trends might be and what data might be telling them (A1 - Executive Manager MI).

Another executive manager with a background in nursing expressed that a lack of familiarity with profession related issues precluded them from having control of the CPD program of individual allied health professionals:

It's a bit hard for me as my background is nursing, so it's hard to talk to another professional and say 'this is what I think you should be doing', so a lot of it is generated through them, and then together we work out how are we going to support them do it (B1 – Executive Manager MI).

Many executives felt they should not control allied health professionals' CPD programs; hence, organisational responsibility was typically delegated to allied health managers.

### **5.3.2 Hospitals share responsibility for CPD**

Despite the primary responsibility for CPD expected of allied health professionals, all participants considered that hospitals also shared responsibility regarding professional learning. Many managers believed that they should encourage and facilitate CPD for professional staff:

... the hospital needs to facilitate the development, guide the development and allow it to happen, and create an environment that supports and puts emphasis on it. But at the end of the day, it comes back to the allied health professional to be wholly responsible for it, but the hospital needs to create an environment that supports that (D3 – Physiotherapy Manager / Competent+ Physiotherapist).

The majority of executives and allied health managers felt obliged to encourage and facilitate CPD; however, their support was conditional, expecting profession related learning to benefit the hospital.

### **5.3.3 Professional associations' role**

The executive managers also believed that CPD programs for regional allied health professionals were improved when associations such as the Australian Society of Medical Imaging and Radiation Therapy (ASMIRT), the Australasian Sonographers Association

(ASA) and the Australian Physiotherapy Association (APA) provided teaching and networking opportunities:

I think they [professional associations] have a vital role, and I think that again, it's about that isolation, so if I was the professional here, I'd like to know that I was linked to other like- thinking people that could support me when I have need, and there is some informal networks (B1 – Executive Manager MI).

Allied health professional associations were lauded by many of the participants for their affiliation with worldwide research networks and presentation of research findings in professional journals:

They have research bodies there that they're aligned with, and they're also tapping into research worldwide; bring the news through the journals, for instance, the InMotion Journal that comes every month. It goes to all the APA members, and lots of things are in there ... (D1 – Executive Manager Physiotherapy).

Many managers and allied health professionals also expressed a need for professional associations to provide high-quality and cost-effective education to their members:

[Professional bodies] have a responsibility to ensure the appropriate training opportunities are out there and they're available and cost-effective, cost-efficient, not priced out of the market (C1 – CEO & Executive Manager MI).

However, there was a common concern that too few regionally located CPD activities were made available to allied health professionals:

We've registered as physios, and we've paid for their membership through them. You do that because you want to better yourself as a physio and become more proficient in your profession, and I think if they're not providing that education, it's a lot harder (C4 – Physiotherapy Manager / Competent+ Physiotherapist).

Although professional associations such as ASMIRT in radiography were expected to bear some responsibility for members' professional development, one radiographer described receiving few benefits from membership:

The interactions that I've had during my career as far as the AIR [ASMIRT] is concerned ... has not been a positive ... and for someone like me who is regional, I'm not going to the National conferences" (C5 – Early Career Radiographer).

In summary, the majority of executives, allied health managers and professionals believed that while allied health professionals were primarily responsible for their CPD programs, hospitals and professional associations also shouldered some responsibility.

## 5.4 CPD Activities

The semi-structured interviews enquired about the CPD activities that allied health professionals had participated in over the previous year. The responses included a wide range of formal and informal CPD activities, listed in Table 10 below.

**Table 10**

*CPD activities undertaken by respondents in the previous 12 months*

- 
- Clinical training courses
  - Online education (including Webinars)
  - Conferences
  - Regional meetings
  - Post-graduate credentialled study
  - Reading journal articles
  - Self-directed learning
  - Supervision & mentoring
  - Tutoring s and colleagues
  - In-house CPD programs
  - Presented at CPD tutorial
  - Training for new equipment by applications specialist
  - Quality assurance activities
  - Management coursework
  - ASMIRT approved word finds/crosswords
  - Anecdotal information from colleagues
  - Social media feeds, e.g. Facebook
  - Mandatory competencies (e.g. hand hygiene)
- 

All allied health professional respondents had similar understandings of what CPD encompassed. They believed there would always be new knowledge and skills to enhance their practice after graduating from university. However, early career allied health professionals typically focused on developing their overall clinical knowledge and skills, whereas more experienced practitioners often focused on preparing themselves for career progression. The following section explores the competencies or skill-sets participants in this study believed necessary for high-quality allied health professional practice.

## 5.5 Competencies considered necessary for good practice

The interview schedule guided discussions with the respondents regarding their perceptions of allied health professionals' essential skills and knowledge. The subsidiary question to be answered in this part of the semi-structured interviews:

- Which competencies do hospital managers and allied health professionals consider necessary for good practice?

Allied health managers expected staff to be sufficiently competent to undertake their occupations; however, they commonly preferred to include both hard and soft competencies in learning programs. One manager provided an example of the distinction between hard or soft competencies; ‘hard’ technical or practice competencies such as “how to tape a knee” or ‘soft’ competencies “such as professionalism” (C2 – Executive Manager Physiotherapy). Five competencies that were expressed by the respondents as common themes are considered in this section, including patient care; knowledge for practice; interpersonal and communication skills; professionalism); and interprofessional collaboration (subsections 5.5.1 - 5.5.5).

### **5.5.1 Patient care**

As previously described, patient care was one of the main motivations for participants undertaking CPD (refer to subsection 5.2.2). The interview responses from many respondents considered competencies involving high-quality patient care as paramount, some discussing that the government also prioritised a patient care focus:

I think there’s always areas to be improved on, to learn in each area that you work in and just for best patient care and patient-centred care, you want to make sure that you are providing the majority of up-to-date, relevant treatment for people to achieve their goals (C4 – Physiotherapy Manager / Competent+ Physiotherapist).

In addition, many of the allied health professionals discussed high-quality patient care as an essential competency and was the underlying reason they joined their professions:

The reason why I’m doing this and that’s what is more important to me is patient care, because that is why you are doing what you are doing. You’re doing it to help people, so that is my priority is the patient (C3 - MI Manager / Competent+ Radiographer).

The interview responses regarding patient care as a competency suggest that the majority of respondents are constantly striving to improve the efficacy of diagnoses or treatments:

So I would think you would do continual professional development because you are trying to improve what you are doing, and the better your work either, the more people you can help or the better you can help a person (C3 - MI Manager / Competent+ Radiographer).

However, the interview participants in radiography and sonography often felt excluded from knowledge about patient outcomes regarding imaging or treatments in which they were involved. Therefore, they did not get feedback regarding efficacy:

... but more to the point, we're missing out on the patient outcome because we don't always see that patients get better. We just, we occasionally, and I find this especially in CT, we occasionally see patients get worse, because I see patients, if I see a patient regularly in CT, something's going wrong ... they haven't gone home or they're getting worse. So it's a hard thing (D4 – Competent+ Radiographer).

When discussing the competency of patient care, one executive manager emphasised a preference for a more holistic, preventative approach:

I suppose I see one of the important parts of allied health is to try and get a wider understanding of the whole case. I suppose it goes back to part of my concern as a bystander, which is probably as a manager in some ways you are a bystander is we just ... we've got to be careful not to just diagnose the one problem but to make sure that we have a look at it in a holistic way (A1 – Executive Manager MI).

Additionally, a less common theme emerging from the interviews was that some of the respondents considered that the patient care taught in undergraduate training was sufficient; believing that allied health professionals did not require reinforcement of this competency through CPD activities:

... so that's [patient care] usually what we do in our allied health whole group in-services so patient care models and client-centred practice and evidence-based practice. All that kind of stuff is usually on offer, and we are usually expected to participate in the majority of it, and it is important to know, but because it's hard hit into us at uni I feel like that's my foundations for practice. Working on that, I don't feel I can learn too much about that kind of stuff now (D9 – Early Career Physiotherapist).

In summary, the respondents in this study generally considered patient care an essential competency required for high-quality clinical practice. However, two less common responses were also elicited, one preferring more holistic, preventative patient care, and the other believing that undergraduate training successfully instilled the patient care competency in graduates and thus may not be suitable for inclusion in CPD programs.

### **5.5.2 Knowledge for practice**

When asked about competencies required for allied health professionals' CPD, typical responses from participants included knowledge for practice. Many allied health professionals in this study notionally grouped all CPD competencies under the umbrella phrase 'knowledge for practice'. However, hard competencies of clinical knowledge and

skills were often prioritised in participant's CPD programs, despite the numerous soft competencies participants considered essential for good practice:

I think that that's okay to have [knowledge for practice] as part of your CPD, and there's probably an element that always needs to be of a technical nature, but depending on how experienced you are and how many years you have been doing that, you can probably have less technical if the equipment hasn't changed (A1 – Executive Manager MI).

Many respondents considered gaining knowledge for practice as part of a career-long continuum of learning facilitated by CPD programs. In addition, allied health professionals described constantly changing practice and research evidence requiring knowledge for practice to be refreshed regularly:

Well, the majority of important is always the basic clinical knowledge, so what they get from school and what they have in their specific area of interest. So knowledge of what is happening out there with research and so on, we are always interested in making sure that our clinicians are not practising 1920s, they are always knowing what's going on (D1 – Executive Manager Physiotherapy).

In addition, many interviewees believed that much of the knowledge taught in undergraduate degrees needed a synergy with practice experience before proficiency in new skills was attained:

... your clinical knowledge is probably in there as well. So being able to put people's stories together with a clinical pattern so that you're treating them in the right way and then knowing the limit of your knowledge. So knowing when things are beyond you, so whether you need to talk to a colleague or whatever, they're actually outside the scope of Physio, and you need to be getting somebody else involved (A7 – Competent+ Physiotherapist).

Physiotherapy participants also described the need to have a sound knowledge base and confidence in clinical reasoning and practice, which they expected to develop progressively with experience:

I probably feel like I've got quite good clinical reasoning. I hope that other people think I have too. Say with paediatrics because I'm newish to the whole area; I might have good clinical reasoning to know what we do to get a good result but not necessarily the skills to be able to do it (B4 – Competent+ Physiotherapist).

In the disciplines of radiography and sonography, a less common response from managers and practitioners stated that understanding the physics underpinning the imaging modality was an essential component of knowledge for practice:

A good knowledge and acumen of the technology, I think a comfortable nature with the theory and the technology that you're using, because something I have to explain to a lot is that we deal in a job which is black magic to 99.9% of the population. People don't know what we do, but they know what an x-ray looks like, and they also know what radiation is (D4 – Competent+ Radiographer).

Allied health professionals, in particular, consider all CPD activities as 'knowledge for practice'. However, hard competencies regarding clinical practice were often prioritised in CPD programs, despite the many soft competencies respondents considered essential. The interviewees also described their evolving practice, thus needing to remain current with contemporary research.

### **5.5.3 Interpersonal and communication skills**

When asked which skills and knowledge were vital for allied health professionals' practice, managers typically suggested that staff should include some of the soft skills mentioned previously, including good communication skills:

So I think a relationship in that space [communication skills] should be part of your CPD, so there is a management of patients in your CPD that should be allowable, and it might be psychology of people, or it might be something else because some come in a distressed state and not being given the right information ... not enough to give them a level of comfort (A1 – Executive Manager MI).

The majority of allied health professionals also valued well-developed interpersonal and communication skills as a component of high-quality practice. Many of the participants explained the need to be able to tailor communications for colleagues from other healthcare disciplines:

... in a multidisciplinary environment; you need to be able to speak with doctors, speak with nurses, communicate to everybody to get your scan done or something like that. So you need to be able to be polite and considerate, but also knowledgeable enough to get what you want done for the patient (A5 – Early Career Radiographer).

### **5.5.4 Professionalism**

When study participants discussed competencies considered essential for allied health professionals' CPD, all interviewees believed that exhibiting professionally acceptable attitudes and behaviours was necessary for good practice:

There are some guidelines that we need to work within when we're practicing, and they are described by AHPRA. They're also described by the Australian Physiotherapy Association, and they're also described by the individual workplace and of course we have expectations in the way that we behave and we have a values and mission statements (A8 – Early Career Physiotherapist).

The majority of allied health participants believed that underlying personality, attitudes and values may be difficult to change in some people. However, they generally acknowledged that demonstrating professionally acceptable behaviours was critical:

... but at the end of the day ... we do need to have these behaviours; otherwise, we're not going to function very well as a department ... you probably can't modify an attitude, but if ... you can change a person's perception, like a perception on something that they might not have realised was actually not a good way to behave (A5 – Early Career Radiographer).

In addition, the majority of managers and allied health professional participants were sceptical about using CPD programs to curb intrinsically poor attitudes and behaviours:

Yes, it's something that we always need to be reminded of, from some of the examples I've seen recently. Again it's not probably something that I would go and do a course on necessarily, but it something that we all need to be aware of. But in saying that, sometimes we do need to be reminded of exactly what our standards are and why they are (B4 – Competent+ Physiotherapist).

Many participants believed that enculturation of professionalism began during university training and continued throughout their career and was therefore not suitable for inclusion in CPD programs. However, a few participants thought that a reminder of professional standards was occasionally necessary for some people:

I don't think it ever hurts to remind people of what the right way to speak to each other is and how to get around disagreements. We have not a very good track record at \*\*\*\*\* [this regional hospital] with bullying and things like that, and we all had to do a meeting about it and learn how; what's above the line behaviour and below the line behaviour (A5 – Early Career Radiographer).

A few managers felt the need to address the soft competency of professionalism in the workplace through human resource management initiatives rather than in CPD programs:

I guess the difficulty in that is getting people interested in that in seeing how their behaviours affect the team. I was involved in one of the management courses in developing this target up here, which is trademark behaviours and how we get people to display these behaviours, and realising the effect of their own behaviours on other people (D2 – MI Manager / Competent+ Radiographer).

One executive manager was particularly complimentary concerning the professionalism exhibited by allied health professionals:

... when you're dealing with allied health staff they are invariably passionate, they're articulate, they have an opinion, they know where they're going generally in this world and that makes it extraordinarily easy to manage (E2 – Executive Manager Physiotherapy).



In contrast, one executive manager discussed a recent intervention in response to a staff survey that suggested unprofessional behaviour was rife throughout their hospital. Following the survey, a committee distilled staff feedback into four values they thought the majority of relevant to the hospital: teamwork, respect, accountability, and compassion. Whether staff met those values was described as ‘above and below the line behaviours’:

We have worked very hard to use positive feedback ... formal recognition and informal recognition to drive the above the line behaviours and certainly working on getting people to have difficult conversations or feedback around below the line behaviours (A3 – Physiotherapy Manager).

Among competencies essential for allied health professionals’ CPD, a common theme was that exhibiting acceptable attitudes and behaviours was part of good practice and a component of the implied social contract between professions and society. However, many respondents thought that the enculturation of professionalism instilled during undergraduate training meant that professionalism might not be suitable for inclusion in CPD programs. In addition, professionalism in allied health allows interrelationships with colleagues from other professions to facilitate significant synergies in healthcare.

### **5.5.5 Inter-professional collaboration**

Common responses to questions about which skills and knowledge they considered essential for allied health professionals’ work included inter-professional collaboration as a discrete competency. Some of the executive managers believed that CPD programs might benefit from improved knowledge about inter-professional collaboration, which could improve the effectiveness of the everyday work of allied health professionals:

I think it’s a prime area of professional development to open people’s eyes up to look for things that might be interrelated to their discipline, to other disciplines and the art of referring off at the right time to the health person, is what I see is fairly important (A1 - Executive Manager MI).

Some allied health managers discussed the need for staff to be aware of how hospital systems work to provide a better understanding of the workflows:

... [MI staff] even the receptionists, if they know where they fit in and they have an understanding of why we do things I think it makes it better for you because then you’re actually going to try to do it because you know there’s a reason why you do it (C3 - MI Manager / Competent+ Radiographer).

Many of the allied health professional participants found noticeable differences in inter-professional collaboration they experienced in different workplaces or within different disciplines:

I think it depends on your workplace and I think it depends on the other people in your workplace. I have a very close working relationship with the OT and Speechy; I feel like I understand their job and they understand my job well (B4 – Competent+ Physiotherapist).

In addition, a common theme among allied health professionals was that they considered inter-professional collaboration to be essential for their day-to-day work, believing that CPD around this competency might be beneficial:

I think there could be more links with other professions. So, like in everything we don't just work as Physio's exclusively on Physio things. We work with other professionals and so I think some PD opportunities around multidisciplinary management of things would be a compliment to what they already provide (A7 – Competent+ Physiotherapist).

Many managers preferred CPD that discouraged knowledge silos and expressed the need for staff to understand hospitals' workflows better. In addition, it was common for allied health professionals to consider interdisciplinary relationships benefiting their day-to-day work and, therefore, suitable for inclusion in CPD programs.

Considering this section as a whole, hospital managers and allied health professionals generally considered that competencies necessary for good practice included high-quality patient care, knowledge for practice, interpersonal and communication skills, professionalism, and interprofessional collaboration. The following section discusses the relationship between hospitals' knowledge management and its effect on allied health professionals' CPD programs.

## **5.6 Hospital Knowledge Management and CPD**

The two common approaches to Knowledge Management (KM) emphasise either explicit or tacit knowledge. However, the exploitation of both explicit and tacit knowledge may be required to implement KM systems successfully within healthcare organisations. The research participants were encouraged to discuss their experiences regarding the hospital's profession related KM and its impact on professional practice. The interview schedule guided the questioning of respondents to explore hospitals' reliance on explicit knowledge assets compared to allied health professionals' use of personally-held professional knowledge.

The subsidiary research question to be answered from this questioning was:

- How does the choice between either a personal, organisational or hybrid approach to KM in regional Victorian public hospitals impact the CPD undertaken by allied health professionals?

Four common themes among respondents relating to hospitals' KM and allied health professionals' CPD are presented in this section, including organisational approach to KM; the constraining influence of medicine; personal approach to KM; and how best practice knowledge is shared (subsections 5.6.1 - 5.6.4).

### **5.6.1 An organisational approach to KM**

Executives and allied health managers commonly believed that explicitly available profession related knowledge should be documented in protocol and procedure manuals as part of an ongoing organisational process:

... there is an expectation from me as a manager in each [allied health] profession to actually present the protocol development of quality activities in each discipline's specific meetings, so the expectation is from me that there is always activity in the space (C2 – Executive Manager Physiotherapy).

The executive managers of the majority of hospitals intended that organisational protocol manuals should guide practice. However, one executive manager acknowledged that profession related knowledge for practice was “probably not” treated in the same way as general managerial policies within public hospitals (C1 – CEO & Executive Manager MI). In addition, one less commonly mentioned theme at one of the large/referral hospitals participating in this research was that the protocol manuals were intended to be contemporary best practice or ‘living’ documents and updated as new knowledge became available:

... I have it written down in a footnote on every single page of the document, that this is a dynamic document, this has every chance to change, you'll be alerted but it will, it can always change (D4 – Competent+ Radiographer).

Some participating managers also suggested that there were difficulties in documenting clinical knowledge and that much of allied health professionals' knowledge was personally held:

I suppose a lot of knowledge here and the majority of places are held in someone's head and it's very hard to get that all documented. I think we do need to get more documented and more procedures and more guidelines for procedures (A1 - Executive Manager MI).

However, there were mixed responses from the allied health professionals in MI regarding protocol manuals as a source of knowledge. For example, the radiographers at the large referral hospital knew protocol manuals were provided within the MI department, having compiled manuals for their specialised discipline; the catheter laboratory. However, neither radiographer referred to protocol manuals and reported that few updates to manuals were made after the initial development of the protocols:

[New best-practice knowledge added to protocol manuals] I think ... I don't really know about MRI but in Cath Lab, I think we've probably had one or two things ... Oh since 2012, I reckon (A5 – Early Career Radiographer).

Some participating hospitals reviewed formal clinical policies and protocols in a cycle to coincide with hospital accreditation timelines. During the review, protocols and procedures would remain unchanged if still relevant, be modified to meet current practice, or be retired from service if no longer considered relevant or best practice:

The thing that we've done is move into advanced practice projects where we've really had to start new roles and then we have quite a formalised process in terms of getting the governance right and setting out procedures, policies, and checking competencies (A3 – Physiotherapy Manager).

Explicit protocol and procedure manuals were universally available in the participating hospitals' MI departments. However, few radiographers or sonographers regularly consulted written protocols, relying on personally-held knowledge to guide their everyday practice.

In summary, executives and allied health managers typically believed that profession related knowledge should be documented in protocol manuals to guide allied health professionals' practice. However, some managers did not believe that profession related implicit knowledge could be fully documented and that individuals held much of the allied health professionals' knowledge. Although protocol manuals were available in all participating hospitals' MI departments, few radiographers or sonographers regularly consulted them, preferring to rely on their personally-held knowledge to guide their practice. An idiosyncratic theme from a participant at one of the large hospitals was that protocol manuals were intended to be 'living' documents and updated as new best-practice knowledge became available. In contrast to MI departments, comprehensive

protocol manuals were unavailable in the physiotherapy departments of these public hospitals.

### **5.6.2 The constraining influence of medicine**

Comprehensive written protocol and procedure manuals were available in radiography and sonography departments at all participating hospitals. However, many of the profession-specific protocols and procedures were drafted based on legacy documents from the radiology service provider:

So in consultation with the radiologist, so for say our general imaging we have specific ... if there is indications for say osteoarthritis of the knee then the radiologist wants four particular views. If it's a trauma knee then they want a minimum of three particular views (D2 – MI Manager / Competent+ Radiographer).

Therefore, the contents of many of the MI protocols were governed by the radiologists and did not involve local radiographers or sonographers in their development:

...we have procedure manuals for everything, from how to do a wrist x-ray down to how to do an ultrasound and everything in between ... and that is obviously been overseen by the Radiologists' group themselves. Some of it's brought from them, and some of it's the way we just do it; we need to formalise it on paper (C3 – MI Manager / Competent+ Radiographer).

Similar comprehensive written protocol and procedure manuals containing the imaging expectations for each examination were available in other MI specialties, such as CT and MRI. In addition, in all participating hospitals, proposed changes to MI protocols that allied health professionals considered best-practice required consultation with the supervising radiology group before any proposed changes were approved by the radiology group, who could rubberstamp or reject changes:

At the end of the day, they are responsible because we are just the people in between the patient and the doctor and at the end of the day if someone can get sued it's the doctor; so they are responsible ultimately (C3 – MI Manager / Competent+ Radiographer).

Allied health professionals in MI accepted that radiologists would be highly influential in the development of MI practice protocols due to the existing legal onus of responsibility required by Australian government legislation:

[Radiologists have final say on protocols] ... it's not like it's a pride thing that they say no, they know better. But at the end of the day they're the ones that are recording it and so if they're asking for something then and they have to report it, then we just have to do it (A5 – Early Career Radiographer).

Furthermore, the application of protocols was sometimes constrained by the supervising radiologist's personal preferences:

Following the protocol would be the majority of important thing ... being aware of the protocol, and the second thing is being aware of what the radiologists prefer, what they want, what makes them happy (C5 – Early Career Radiographer).

Despite the overriding control by the medical profession, some radiographers considered that there was a need to demonstrate their increasing level of knowledge, skills and accountability:

I'd have to say the very nature of CPD means that you're enhancing your professional knowledge and your professional skill base. Now unfortunately we do work in a profession which is incredibly restricted in where we can operate, what we can do and how we can actually use our knowledge (D4 – Competent+ Radiographer).

A few respondents in this research were required to multi-skill as both radiographers and sonographers. However, those who worked in small/medium-sized regional hospitals were also required to undertake both roles in an on-call capacity without the supervision of a radiologist:

... you're still working independently, particularly as a radiographer, out of hours here, you're still working independently, no matter what you're doing, but being in ultrasound you need to make more of your own decisions, right, how you're going to go about getting the information that, hopefully the doctor's asked to get (D7 – Competent+ Sonographer).

In addition, many of the sonographers that participated in this research discussed the increased accountability compared with their time as radiographers. The greater independence of practice required more significant engagement with CPD, but this was frequently cited as a positive aspect of sonography:

... the reason why I started learning ultrasound, because I like to work in an independent manner, so that's one of the things that really drove my interest right from the start. Apart from the fact that it's also, it's a rapidly developing field (D7 – Competent+ Sonographer).

In summary, comprehensive protocol manuals were available in radiography and sonography at all participating hospitals. However, the radiology service providers prescribed many protocols and did not involve allied health professionals in drafting.

### 5.6.3 Personal approaches to KM

The majority of the managers responsible for hospitals' MI departments in this study discussed the knowledge assets of an organisational approach to KM with a perceived reliance on explicitly documented profession related knowledge. In contrast, the physiotherapy departments did not have dedicated protocol and procedure manuals. Nevertheless, some managers described the existence of surgical guidelines; "there might not be a manual per se" (C1 – CEO & Executive Manager MI). However, the physiotherapist respondents did describe some documented assessment and treatment protocols or clinical pathways prescribed by specialist medical practitioners. However, physiotherapy managers and practitioners also believed that a wide range of patient presentations provided little opportunity for using a single defined best-practice protocol. As a result, the respondents believed that everyday physiotherapy practice could not rely on research evidence alone; instead, combining research, professional experience and clinical reasoning:

... when we do talk about evidence-based practice it is true that in many allied health professions there's not a strong evidence base for everything that we do and in some cases there's quite a lot of gaps ... There's other areas where there's inklings of evidence that you would tend to follow and there's others that there's really not much and it's really this expert opinion (A3 – Physiotherapy Manager).

Some early career physiotherapists had referred to and used documented protocols in practice. In addition, one of these physiotherapists was involved in the development of a protocol and referred to it frequently:

Yes, absolutely [refers to protocol manuals], well actually, as part of that upper limb project [protocol development] in 2015, we developed a clinical practice protocol for the assessment of the upper limb after stroke. So I refer to that regularly throughout my week to help in regard to the assessment of the upper limb after a stroke (A8 - Early Career Physiotherapist).

Although a personal approach to KM would usually exploit social interaction among employees, participating managers were unaware of specific hospital policies that encourage interaction. However, it was common for managers to expect personal networks to facilitate knowledge sharing:

I haven't directly spoken to them much about that, but my expectation is that through those conversations they have been learning more all the time and especially with those working across not just here, but having contacts in other places (A1 - Executive Manager MI).

The physiotherapy respondents relied on personally held profession related knowledge, and a few participating hospitals facilitated knowledge sharing by encouraging social engagement. However, one executive manager believed that physiotherapists were less involved in regional communities of practice than previously:

... when I started my career the Physio association had a really active regional group that we're all part of, but I don't know that that's happening quite so much in Physiotherapy (B2 – Executive Manager Physiotherapy).

The physiotherapists frequently described having greater autonomy than other professions, allowing them to undertake clinical assessments and decide on the best treatment options for themselves. However, managers had expectations that physiotherapist would know their limitations and refer patients to senior clinicians when appropriate:

So primarily they [early career physiotherapists] are taught to know and acknowledge their limits, so their scope ... so they have to define their personal limitations of clinical practice. So once they've identified that, it's up to them to defer to a more senior clinician, however there is no law that says 'go and check where that is occurring or not occurring' (D1 – Executive Manager Physiotherapy).

Participating physiotherapists revealed that medical practitioners rarely challenged their autonomy. Nevertheless, some physiotherapists believed that occasionally being challenged by medical practitioners provided an impetus for increased engagement with CPD to maximise their knowledge and skills:

So learning and feeling confident with your clinical reasoning, I think it's really important and I think it motivates you to do more learning to make sure that you feel confident in going to people and saying 'this is what I think should happen' (D3 – Physiotherapy Manager / Competent+ Physiotherapist).

Therefore, it was common among physiotherapists to describe their reliance on personally held profession related knowledge; however, few described any formalised approaches to knowledge sharing in their hospital.

#### **5.6.4 How best-practice knowledge is shared**

The executives and allied health managers were asked how their hospital contributed to the expertise of allied health professionals. Responses included that it was typical for hospitals to attempt to recruit allied health professionals with appropriate knowledge and skills, which CPD activities would then enhance. In addition, some managers discussed informal ad hoc opportunities for learning available at their hospital:



... informally it [learning] happens as things arise, there might be a case of something that we've had to review, and it might have been a lack of knowledge by the professional actually undertaking the scan, for example. So we encourage them to go and do some education related to that issue (B1 – Executive Manager MI).

However, a common theme expressed by hospital managers suggested there may be a lack of formal knowledge-sharing arrangements in the participating hospitals:

At this stage, I think it's done poorly at our organisation ... Unless you know someone is going to something and you ask them, it doesn't really get shared" (C4 – Physiotherapy Manager / Competent+ Physiotherapist).

The MI allied health professionals were unaware of formal professional knowledge sharing at participating hospitals. However, the informal methods of knowledge sharing discussed included leaving notes, staff emails and incidental staff interactions:

... people that rotate through the Cath Lab if you need to let them know something that's the way to go [email], or you try and catch up with them on an individual basis or because it's often difficult to have us all together ... but if you do see them individually, you just mention it and try and disseminate it in that regard (A4 – Competent+ Radiographer).

Physiotherapists in all but one hospital, had regular on-site CPD sessions organised by all participating hospitals, allowing an opportunity to share best-practice knowledge with their colleagues:

[New best-practice knowledge shared with colleagues] ... so that would be normally in our lectures or our professional development sessions, that's when they sort of discuss all that stuff (A9 – Early Career Physiotherapist).

Sharing profession related knowledge among allied health professionals often relied on anecdotal information from colleagues. However, in smaller hospitals, the number of colleagues that radiographers interacted with each week was relatively small:

... there are so many times that you've got so many questions, and with us, the doctors [radiologists] are only here on Wednesday mornings and even during that time or even like those clinical meetings you can put up questions about stuff. You don't even have to put up questions; you can just sit there and the interaction ... soak it all in, that's how you do it here (C5 – Early Career Radiographer).

There was a strong reliance in MI and physiotherapy on anecdotal information shared among professional colleagues; however, this sharing was usually limited to those within the same discipline or domain specialisation:

... it depends on what it is, and so if there's say a particular article that's come out or whatever we might share it amongst the Musculoskeletal team but not more broadly.

Otherwise it might just be, we have a lot of chit chat in our write up room. It might just be a conversation in there (A7 – Competent+ Physiotherapist).

Although anecdotal information was frequently shared among professional colleagues, the allied health professionals assumed information to be fallible, with its acceptance depending on their estimation of the knowledge provider:

... one of the things about learning is you learn to analyse what you are told, because it may not be right. So you always have to know where it's coming from. Is that opinion? Is it written somewhere? Where's it written? (A6 – Competent+ Physiotherapist).

One of the less common themes identified in one small/medium regional hospital was the difficulty with knowledge sharing that stemmed from isolation in day-to-day practice. Regardless of participating hospitals' size, the opportunity for allied health professionals to interact with their colleagues was often limited, with staff typically working in relative isolation. Thus, profession related learning is the majority of often from professional experiences and sometimes by searching for new knowledge when needed: "I guess we all work in different areas too ... you can't just walk into the room next door and ask" (C4 – Physiotherapy Manager / Competent+ Physiotherapist).

So that's, I think a big part of like continuing our professional development, is we are required to do these scans so we should be doing them, we should figure out how the best way of doing them is, and occasionally that means for me, I call my counterpart CT guys in \*\*\*\*\* [other regional centre] or up in Melbourne or places like that ... (D4 – Competent+ Radiographer).

In summary, hospitals attempt to recruit allied health professionals with appropriate knowledge and skills for advertised positions, then expect enhancement of knowledge through future CPD activities. All participating physiotherapy departments, except for one small/medium-sized hospital, provided regular in-service CPD sessions allowing the sharing of knowledge. However, in MI there was little formal knowledge sharing and a reliance on informal ad hoc learning opportunities. In addition, much of the radiographers' and sonographers' learning is from their own practice experience and individual CPD.

## **5.7 Planning of CPD Programs**

The research participants were encouraged to discuss their experiences regarding each hospital's contribution to CPD planning and its influence on the planning endeavours of allied health professionals. The interview schedule guided discussion with the

respondents and sought to determine practitioners' use of planning for CPD and reflection in day-to-day practice.

The subsidiary question to be answered by this section of the interview was:

- What factors influence the planning of CPD programs undertaken by allied health professionals in regional Victorian public hospitals?

11 factors affecting allied health professionals' planning of CPD programs are considered in this section, including hospital accreditation; hospital provided CPD; hospital support for CPD; recruitment and retention; reflective practice; reactive reflection; long-term planning; local availability of CPD; online learning; formal and informal CPD activities; and interdisciplinary CPD (subsections 5.7.1 - 5.7.11).

### **5.7.1 Hospital accreditation**

When answering questions about hospital employees' CPD programs, the executives and allied health managers described being mindful of hospital accreditation requirements, including expecting to undertake annual performance reviews for all employees. The managers often stated the reason for performance reviews was to encourage a more strategic approach to CPD:

So the intention going forward as part of the performance reviews is to make sure that people do have a plan. So that's where I see us moving forward to. As part of our accountability for individuals and their annual performance review, which should be an ongoing conversation, their professional development is part of that. So we have an accountability to the organisation and make sure people are continually trained (A1 - Executive Manager MI).

Participation in planning allied health professionals' CPD using a formal annual performance appraisal was a common theme among managers, many of whom described the intention to map out and facilitate CPD programs for the following 12 months:

That's part of it [annual performance appraisals]; making sure that they've continued on with that, and is there anything that I can do to help to help meet their requirements or if there is anything that they are interested in? Also, part of that is 'where do you see yourself heading'? 'Is there a particular modality that you want to continue or are you happy doing what you are doing'? (D2 – MI Manager / Competent+ Radiographer).

Hospital managers and allied health professionals participating in this research often described the annual performance review as being the only formal planning for CPD:

One of those boxes you have to do tick for your reviews ... you need to show that you have had an effort and what have you done for professional development so that they can see that you are not just slacking, not just doing your job but they can see that you're improving yourself as well (C3 – MI Manager / Competent+ Radiographer).

A further common theme from the interviews among allied health professional respondents suggested that the compulsory annual performance review was often not perceived by them as meaningful planning for their CPD programs:

We don't really do that [have a planning process in the hospital], it's more of a 'you do your own thing ... it's your responsibility so you should take responsibility for it' (D4 – Competent+ Radiographer).

Another less common theme arising from interviews was that performance reviews conducted by managers could also be improved if they were carried out less formally and more frequently than the 12-month cycle prescribed by hospital accreditation:

... you shouldn't have to wait once every 12 months to do that. You should be doing that as a more common thing. But to formalise things like that it makes it very difficult. People have got to have ... the manager's got to have time and the person you're talking to has got to have time to sit down and talk about it as well. We used to do them all informal way in the older days but now it's not so. It's done more formally and less effectively I think (D7 – Competent+ Sonographer).

Therefore, executives and allied health managers conducted annual performance reviews for all employees to comply with hospital accreditation requirements while also thinking that performance reviews would encourage strategic planning for CPD programs. However, many allied health professionals in this study discussed the mandatory annual performance review as the only formal CPD planning they undertook. However, they also frequently perceived the reviews as a tick box exercise and not a meaningful part of CPD planning.

### **5.7.2 Hospital provided CPD**

Responses usually correlated with the respective disciplines when asked whether their hospital provided formal CPD activities for allied health professionals. For example, during the interview period, none of the hospital's MI departments had formal clinical meetings or provided CPD activities to radiographers or sonographers:

They [on-site clinical sessions] were once a month and then I'm not quite sure why they stopped. I'm not sure if it was too busy or what happened. I think they were going to try and bring it back this year (A5 – Early Career Radiographer).

In contrast, the managers responsible for physiotherapy all expected their hospital to provide formal CPD activities for employees, mainly delivered through monthly in-service clinical training:

We do lots of in-service which comes as a result of needs analysis that we conduct. Like we survey staff and find out where the interest lies and what sort of topics they want to learn about. That can change from time to time (D1 – Executive Manager Physiotherapy).

The physiotherapists in all but one small/medium-sized hospital reported regular CPD clinical sessions, typically covering various profession related topics. However, some participants believed that the in-house sessions were more focused on early career physiotherapists, with more experienced practitioners benefiting more from external CPD activities:

So our early allied health graduates are involved in the Early Graduate Program which is run regionally; there's a couple, we can either go to \*\*\*\*\* or \*\*\*\*\* [larger regional hospitals] and ... everybody has a professional development plan or a personal development plan which really is around that documenting their learning goals and having some planning around that. From the structural perspective we do it much better for junior staff and then it gets, I guess the structure is less formal as you get into a senior position (B2 – Executive Manager Physiotherapy).

Many of the physiotherapist respondents also reported that some local clinical staff meetings included specialist guest speakers from metropolitan Melbourne:

Yes, there been a few things that we've organised locally, where we have the APA ... we run DVD showings up here, so if one of our staff is a member of the APA in terms of setting up events then I've encouraged him to do that and also will ask guest speakers and the like to come in as well, but never run a course that is open to other organisations; it's always in-house training (D3 – Physiotherapy Manager / Competent+ Physiotherapist).

In summary, only the physiotherapy departments of participating hospitals provided formal CPD activities for allied health professionals. In addition, the structure of local CPD sessions was of more benefit to early career practitioners. In contrast, experienced physiotherapists needed to attend external CPD activities to meet their learning needs.

### **5.7.3 Hospital support for CPD**

In the interviews, executive and allied health managers were prompted to discuss how their hospital encouraged and facilitated employees' CPD programs. In addition to the hospital-provided CPD activities, the managers also described measures to support allied health professionals' CPD programs. Managers commonly described that they wished to support their employees' own goals, believing that would result in practitioners

maintaining their competence to practice. Included in the hospital support available for CPD was professional development leave of five days annually, enshrined in allied health professionals' enterprise bargaining agreement (EBA). In addition to the previously described annual performance review, some allied health managers discussed assisting employees with CPD planning and helping to identify appropriate CPD activities:

... I will try and pick people that I think will be good for further development in different areas ... and we do it for all the modalities. We have an expression of interest, and then they have to follow and fill out the forms and have a bit of a talk about why they think they would be suitable and why I think they would be suitable or not suitable (D2 – MI Manager / Competent+ Radiographer).

The managers responsible for physiotherapy in a large/referral regional hospital also discussed seeking additional CPD funding through external organisations to reduce the costs to the hospital:

We look for opportunities outside our hospital to sponsor them; that has happened very well with RWAV [Rural Workforce Agency Victoria] and SARRAH [Services for Australian Rural and Remote Allied Health] and some of the external organisations ... (D1 – Executive Manager Physiotherapy).

In addition to providing paid leave for CPD activities as an entitlement under their EBA, it was common among all of the participating hospitals that they would also contribute money towards CPD, ranging from course fees to accommodation and travel:

... so I think from my point of view I've always kept a reasonable amount in a budget that I sort of expect the majority, or half the staff to attend something either within the state or out of the state at least every two years (D2 – MI Manager / Competent+ Radiographer).

As a whole, hospital managers detailed their support for staff participation in CPD activities, including paid leave for CPD activities. In addition, it was common for hospitals to contribute money towards CPD course fees, accommodation, and travel costs. Managers in some hospitals also told of seeking additional funding for allied health professionals' CPD activities through government and non-government organisations to reduce costs and thus enable better clinical practice.

#### **5.7.4 Effect on recruitment and retention**

Executive managers justified the inclusion of generous CPD allowances in allied health professionals' salary packages as necessary for recruitment purposes. Additionally, the difficulties in recruiting skilled allied health professionals to regional and rural areas were acknowledged, with hospitals wishing to satisfy staff CPD interests to reduce attrition:

... and the other [purpose of CPD] is for us to support people who want to do that endeavour so we can keep them here. So it's about workforce; our biggest issue for us in rural health is our workforce. So we want people to come here, feel like they get support and trained, to be educated, to up-skill and hopefully, they'll stay (B1 – Executive Manager MI).

### 5.7.5 Reflective practice

The interview schedule guided discussions regarding CPD planning toward using reflective practice on a day-to-day basis. Reflective practice can inform an understanding of deficiencies in knowledge and skills, which can then inform the planning of CPD programs. Therefore, each hospital's managers expected allied health professionals to undertake reflective practice in their everyday work. However, it was a common theme in respondents' interviews that, although reflection on practice was challenging to master, it was crucial to maintaining currency in their profession:

... you want to be able to reflect on your own practice and say when you need help, when you've got gaps in your knowledge, when to ask someone else, when to refer on. I'd say for everyone in allied health that's probably quite important (C4 – Physiotherapy Manager / Competent+ Physiotherapist).

Many respondents described their reflective practice as an informal process; for example, one allied health manager described 'mini ah-ha moments' (A3 – Physiotherapy Manager) where staff learned from their own experience and from observing the practice of others. However, the same manager would prefer to embed reflection more deeply into physiotherapy practice:

I would like to see whether there is more that we can do to – just thinking what are the core skills to getting people to improve and that just seems to be around something like reflection and learning mindsets and those kinds of things (A3 – Physiotherapy Manager).

In summary, when allied health professionals participate in reflective practice, this can facilitate identifying shortfalls in knowledge and skills, aiding in planning a CPD program. Managers' responses regarding CPD planning showed that they expected allied health professionals to undertake reflective practice in their day-to-day work. In addition, allied health professionals discussed that reflective practice was crucial to maintaining contemporary best-practice. However, many practitioners interviewed only used reflective practice informally, subconsciously learning from their everyday experiences.

### 5.7.6 Relying on reactive reflection

It was common among the interviewees for reflective practice to be used daily. However, many of the allied health professionals reported that much of their reflective practice was reactive, occurred ad hoc, and prompted by unsatisfactory patient outcomes:

If you've been seeing someone for quite a while and it's not progressing, and you just need some new ideas or different ways to treat them, new things to try, I'll think I've got a gap in my knowledge there, and so I will try to look into that (C4 – Physiotherapy Manager / Competent+ Physiotherapist).

One executive manager described the hospital's formal mortality and morbidity (M&M) process, in which allied health professionals were subjected to a mandatory reflection process regarding alleged medical errors:

... I really think we've got it at a point where it's a no-blame culture and people are very constructive and proactive in looking at where things went wrong (A3 – Physiotherapy Manager).

In addition, the executive managers in the participating hospitals reported being responsible for investigating adverse outcomes using the Riskman® risk-management platform:

... captured by the hospital reporting system called RiskMan™ and we use RiskManQ™ to develop a quality process around a risk incident that is identified" (C2 – Executive Manager Physiotherapy).

However, one executive manager acknowledged that the Riskman® process was time-consuming, and caseloads might not allow allied health professionals to report near-miss cases. In addition, high caseloads may not allow sufficient time for self-reflection necessary for well-considered CPD programs:

Time is an issue; have they got time to sit and think as opposed to doing? There is certainly the drive to do, as opposed to finding the time to actually sit. I keep saying 'well if you sit and think and plan, we'll probably do better' (B1 – Executive Manager MI).

All of the allied health professionals discussed their involvement in episodes of reactive reflective practice in cases where a medical error had prompted a review process:

[Reactive learning from mistakes in practice] That's the best learning, unfortunately ... it sinks in and in a lot of ways you can see why, because there are serious consequences and you do not want that to happen again, but it's not the best way obviously, or the ideal way to learn new things, by making mistakes, but if you don't learn from your mistakes that's even worse (A4 – Competent+ Radiographer).



There were differences between the MI professions and physiotherapists regarding the proactive use of reflective practice. For example, none of the radiographers discussed regularly undertaking formal reflective practice in group settings. In contrast, many of the physiotherapist participants told of formal clinical reflective practice in CPD meetings:

... this is something [proactive reflection] that I think I've done quite a lot over the course of the last 3 years that I've worked here, is that I will see a patient in a clinic and they have something that I've never heard of before and I will have to go and try to prepare for that session (A8 – Early Career Physiotherapist).

In this study, managers often discussed reflective practice opportunities within their disciplines as essential for the effective planning of CPD programs. Unfortunately, managers' expectations were not always executed and sometimes did not reflect allied health professionals' experience. For example, one executive manager responsible for MI believed clinical staff meetings would allow case-study reflection and discussion with peers and radiologists. However, those meetings were not occurring. However, this did not mean that reflective practice was not happening. On the contrary, many allied health professionals in this study described informal reflective practice, typically in response to adverse patient outcomes.

#### **5.7.7 Few examples of long-term strategic planning**

It was typical for executive managers to delegate the responsibility for oversight of CPD to allied health managers. When questioned about reflective practice, executive managers responsible for physiotherapy suggested reflection was very proactive. Many physiotherapy managers implemented skills and knowledge self-audits before each four-month rotation for first-year physiotherapists. The managers considered this as a way of identifying gaps in knowledge and skills but also facilitating CPD planning:

... for all the grade 1 rotations we have all the ... I guess tasks and skills and knowledge that you would possibly need on that rotation; and the grade 1's rate themselves in terms of self-efficacy, from never heard of it, to could happily teach someone else (A3 – Physiotherapy Manager).

In addition, at one large hospital, there was a short-term process (12 months) aimed at identifying skills shortfalls among all physiotherapists to identify mismatches with the hospital's knowledge needs:

One thing that we do every year, is we do a skills matrix where we look at all the things that we would need to deliver the service here and trying to identify ... do we have the people with the skills and do we have enough of them at the right level? And that's

certainly a formal way that we have identifying gaps, and then also we would prioritise those and certainly would prioritise any CPD funding, or CPD time or opportunities towards filling those gaps (A3 – Physiotherapy Manager).

However, the executive manager overseeing physiotherapy at one of the small/medium-sized hospitals considered a strategic approach lacking for CPD at their hospital. In addition, they expressed concerns that few formal opportunities for reflection were provided and proposed some more formal reflective practice activities:

There's no real helicopter view of what does it take to become a good physiotherapist and then focus on the PD events from that down ... so it would be nice to have a framework and to know what attributes it requires to become a good physiotherapist, and then plan the professional development (C2 – Executive Manager Physiotherapy).

Although annual performance reviews are required for hospital accreditation, the majority of allied health respondents did not conceptualise performance reviews as part of their real-world CPD strategy. In addition, few allied health professional interviewees had a long-term strategy in selecting their CPD activities, relying on short-term ad hoc opportunities.

However, at the two largest hospitals in this study, four physiotherapists described using a more strategic approach to their CPD, including conducting a strength and weakness analysis to guide their choice of activities, with five-year plans in place:

So yes, it all heads in the direction toward that 5-year goal. However, each year I have a fairly good idea of what rotations are coming up. So I'm able to say okay, in this rotation I'll be learning a lot about these types of patients, so let's get a bit of a head start on that and do some professional development before I go into the rotation (A8 – Early Career Physiotherapist).

Among those with a long-term strategy, the early career physiotherapist explained that their career stage made it possible to maximise learning opportunities due to fewer social commitments. However, the participant placed a caveat on their CPD goals, which required learning relevant to the changing cohort of patients in first-year rotations.

Another less common theme elicited from a small group of late-career MI respondents; these radiographers and sonographers considering retirement believed their career stage was a valid reason to be less strategic regarding CPD:

... what I'm looking at doing in the next few years, I'm going to probably, hopefully not be working at all, but I probably will still remain interested in it (D7 – Competent+ Sonographer).

To summarise this subsection, many executive managers believed that proactive reflective practice was taking place in their hospitals. For example, physiotherapy managers were conducting audits for first-year practitioners to identify gaps in knowledge and skills. However, at one small/medium-sized hospital, few formal opportunities for reflection were provided. In addition, the majority of allied health professionals did not have long-term CPD strategies; however, there were exceptions. For example, four physiotherapists described longer-term strategies for their CPD, including strength and weakness analysis to guide CPD activity choices.

### **5.7.8 Local availability**

Another factor allied health professional interviewees suggested as influencing their short-term planning for CPD was the availability of local CPD activities. Regardless of their distance from metropolitan Melbourne, most allied health professionals suggested their regional location was a disadvantage for accessing formal CPD activities. People that wished to attend formal CPD activities located in metropolitan Melbourne frequently cited return-trip travel time as the primary problem:

So if you consider going to that sort of a thing for a 1-hour lecture and they have some great topics. I don't know, you're looking at a 3-hour drive, one hour there, and then a 2-hour drive back on a Thursday night, it becomes hard (A6 – Competent+ Physiotherapist).

... it's three and half hours' drive from the centre of the city to here, on a good day, depending on whether you go through \*\*\*\*\* [the] freeway in peak hour traffic, or not. But I mean, you can't expect them to have everything at your doorstep. And that's one of the smaller drawbacks of living in the country; you've got to make a bigger effort to actually get access to that sort of stuff (D7 – Competent+ Sonographer).

Some participants acknowledged the difficulties of their regional location for CPD programs but described the benefits of networking when attending local activities, even if less relevant to their caseloads at work:

... availability and travelling ... and all that stuff that happens here and \*\*\*\*\* [nearby regional city], because that's the furthest I've travelled so far. There are times when the topics are not relevant at all, but just to keep up networking, you get to meet people, people from the same background (C5 – Early Career Radiographer).

Many of the participants believed that professional associations were working towards reducing the disadvantage of regional locations by offering some local CPD activities:

Well having it local is good, alright? Now, the ASA travelling workshops in the last few years has been coming up, and I always make it a point if I'm in the area, to actually go to

them, because they make the effort to come up here, so I was encouraging everybody else to go down there, as well (D7 – Competent+ Sonographer).

Another less common theme expressed by an early career radiographer suggested that locally available CPD activities were preferred because they were simply the easy option:

See this is the thing, because I'm in a regional place I try to do what I can, I don't go out of my way to do it; I'm taking the easy way out, that's the truth (C5 – Early Career Radiographer).

On the whole, allied health professionals' short-term CPD planning was influenced by whether local CPD activities were available. However, although distances from metropolitan Melbourne varied considerably between hospitals, many allied health professionals in this study believed that regional location was a disadvantage due to the round-trip travel time. Nevertheless, some respondents could still see the benefits in travelling to metropolitan CPD programs, describing the advantages of networking with colleagues.

### **5.7.9 Online learning**

Many allied health participants described using the Internet to find profession related knowledge to overcome shortfalls in face-to-face interaction. For example, the radiographers used specific websites such as Radiopedia and AuntMinnie, as well as using the web browsers to find information:

I mean it depends what it is, if there's some obscure anatomical thing that you're not, or you don't deal with it very often ... you can just do a quick Internet Google sort of search thing and also it's handy if you've got s or whatever, and you need to pull up a picture of something or other just on the computer (A4 – Competent+ Radiographer).

In addition, physiotherapists discussed using various websites and social media, including reading online peer-reviewed journal articles, participating in practice-related social media and formal university graduate certificates:

... one of our staff members is a representative for the APA so the online webinars we can run here and we advertise it through the APA. We've probably done that three to four times (D3 – Physiotherapy Manager / Competent+ Physiotherapist).

Allied health respondents in this study discussed utilising online profession related learning, and one participant suggested that geographical location was no longer a valid reason for not accessing CPD: “there is not a place in Australia really that you can't have

the Internet, so you can't really use that as an excuse" (C3 – MI Manager / Competent+ Radiographer).

#### **5.7.10 Formal and informal mix**

It was common among allied health professional interviewees to discuss their individual preferences for either formal or informal CPD activities. However, many experienced allied health professionals noted that it was simpler to provide evidence when logging formal CPD activities for mandatory professional registration:

... if I knew that a thing that I was doing was going to come with a certificate, and I'd be able to easily log it through that, then that does make it a bit more appealing (D4 – Competent+ Radiographer).

In addition, one sonographer described the problem with informal CPD activities: "It's hard to document informal stuff though, isn't it?" (D7 – Competent+ Sonographer).

However, some more experienced participants described their preference for informal CPD activities to meet their specific profession related learning needs:

Not as much structured things, but you get to a point where you move away from the structured things and you have learnt how to learn yourself, because sometimes there aren't courses that cater for what you want or what you need (A6 – Competent+ Physiotherapist).

Another common theme among allied health professional respondents was that their preference for either formal or informal CPD activities might change along with their changing work/life circumstances:

There's not a lot of time; weekends are hard sometimes, either with [on-]call or life ... Yes, it's just easier to find the time to do the non-face-to-face, which is probably why they're a better option for me at the moment. If I had more time, especially on the weekends, that's when all of the branch workshops are, then that would be better (B3 – Early Career Sonographer).

Another individual theme was raised by an early-career radiographer who provided an international comparison and told of their experience during a gap year with predominantly informal workplace training. This approach was in contrast to their experiences in Australia, where formal CPD activities seem to be preferred:

... very much on-the-job and nobody talked about going to courses or weekends or anything like that. That wasn't a thing, it was just really on the job and you kind of learnt from each radiographer (A5 - Early Career Radiographer).

In summary, responses were mixed regarding a preference for either formal or informal CPD activities. However, it was suggested by some that providing documentary evidence for professional registration was more straightforward for formal CPD activities. In contrast, other interviewees preferred including informal CPD activities to better match specific learning needs.

### 5.7.11 Interdisciplinary CPD

Another factor influencing allied health interviewees' short-term planning for CPD was the local availability of interdisciplinary CPD activities. For example, the respondents generally preferred locally available educational opportunities; however, they sometimes sought alternative interdisciplinary CPD activities:

... in this hospital we have a clinical education committee including pharmacy, nursing, allied health; all these people meet and consider areas of common ground and also consider trainings of common ground. So they liaise a lot to make sure we are not training isolated clinicians rather we are trying to train people who work as a team (D1 – Executive Manager Physiotherapy).

The majority of allied health professionals espoused the benefits of interdisciplinary CPD activities but described opportunities to participate in them as limited. Moreover, the available interdisciplinary CPD was often not directly relevant to their profession:

Just learning stuff outside of radiology as well, I've been to that. There was one recently ... something regarding Pap smears because things are changing and it was a very good topic, nothing to do with radiology (C5 – Early Career Radiographer).

For example, one of the more experienced physiotherapists attended sessions held by radiologists and orthopaedic surgeons to gain a different perspective of their patients:

... on a weekly basis I do attend a Radiology meeting here, so there's certainly things that you learn from that and learn from seeing the images from a radiological point of view, but also from hearing the Orthopaedic Surgeons and their reasoning behind doing the surgery, and how it went *et cetera* (A6 – Competent+ Physiotherapist).

Some allied health professionals described having access to informal discussions with friends and colleagues from other health professions, discussing areas of overlap between their disciplines. For example, one sonographer described a training opportunity developing from an informal conversation:

I was talking to an infection control nurse ... and we started talking about arterial Dopplers in the ankles and working out vascularity of the leg ... with diabetic ulcers and that, and I said 'has anyone trained you?' 'No, no'; you should be looking at the radiology

department as a resource. So basically she has contacted the \*\*\*\*\* radiology department and have them set up something (E7 – Competent+ Sonographer).

However, a less common theme elicited from the interviews with one radiographer who suggested that interdisciplinary CPD was discouraged at their hospital:

I think if we rocked up to one [another disciplines' CPD session] it would be a bit of “Oh well thanks for coming, but why are you here”, sort of thing (D4 – Competent+ Radiographer).

In summary, a range of approaches to the planning of CPD was evident among the allied health professionals. However, they commonly mentioned factors that influenced their planning of CPD programs. These factors included hospital-provided CPD activities, reflective practice and identifying gaps in knowledge, reliance on reactive reflection, local availability of CPD activities, choices regarding formal and informal CPD activities, and the availability and uptake of interdisciplinary CPD opportunities. Finally, few allied health professionals interviewed had a long-term strategic plan guiding their selection of CPD activities, often relying on ad hoc opportunities.

## **5.8 Informal learning in regional hospitals**

The research design's consideration of hospital size expressed the dichotomy between small/medium and large/referral hospitals that may affect the type and availability of learning opportunities and communities of practice (CoPs). In addition, the research design expressed the dichotomy between inner and outer regional hospitals in Victoria, Australia. This dichotomy allowed an exploration of the differences in allied health professionals' knowledge and skills in different geographical locations. Finally, the research design incorporated the relationship between participants' beneficial learning styles for various levels of professional expertise.

Furthermore, the contribution of work structure, including challenging practice and learning alongside expert practitioners, has been identified in the literature review as crucial for successful learning. Therefore the interview schedule guided discussions with the respondents about regional hospitals' effect on the learning from day-to-day practice.

The subsidiary question to be answered by this section of the interview was:

- How does working in regional Victorian public hospitals affect allied health professionals' knowledge and expertise?

Three aspects of informal learning in regional hospitals are considered in this section, including the requirement for generalist practitioners in small/medium-sized hospitals (subsection 5.8.1); collaboration with experts (subsection 5.8.2); and the availability of challenging practice (subsection 5.8.3).

### **5.8.1 Generalist practitioners in small/medium-sized hospitals**

When asked questions about how their hospital contributed to the expertise of allied health professionals, a common theme among executives and allied health managers was that they initially attempted to recruit people with an appropriate skill level for advertised positions. For example, in all hospitals participating in this research, managers aimed to employ knowledgeable and skilled practitioners wherever possible:

In an environment of safety and quality it's really important. So coming back from that you've got position descriptions that clearly state 'what are the credentials?' with the view that they really should be increasing as you go through and if someone has that clinical expertise, I would expect them to have that theoretical background to be able to support their clinical practice ... (B2 – Executive Manager Physiotherapy).

In the majority of participating hospitals, the managers responding to this line of enquiry hoped that eligible professionals employed by them would be “specialist generalists” (C2 – Executive Manager Physiotherapy) and competent in more than one area of focus:

... the generalist professional is a better option for our hospital because they are more flexible ... so the more people that we've got that are generalists rather than being specific practitioners is better, we're better off (B1 – Executive Manager MI).

Many participating hospitals' managers did not identify any specific hospital programs that targeted improvement in allied health professionals' expertise. However, the hospitals' executive managers hoped that CPD activities would supplement existing knowledge and skills:

I expect them to be extending any knowledge they've got; to learn further and would expect them to share that information with everybody else. None of us are experts in everything, so it's just helping to share the body of knowledge (D3 – MI Manager / Competent+ Sonographer).

A common theme among participants was that knowledge and expertise might be limited in specialised practice domains when working in regional hospitals. However, this was sometimes an advantage for those who wished to remain in regional settings:

... if I ever went to a metropolitan area or even somewhere as big as \*\*\*\*\* or \*\*\*\*\* or \*\*\*\*\* [larger regional hospitals] then I would hope to become a bit more specialised but I



would much rather be a jack of all trades, master of none, but it's better than being a master of just one because I don't ever see myself working in metro area for a long time. I grew up regionally; I studied regionally and working regionally (D9 – Early Career Physiotherapist).

A less common theme proposed by a few allied health professionals was that although specialised practitioners were preferred in large hospitals, there would still be a proportion of generalist practitioners required to meet caseloads:

Well, I'm pretty sure that the hospitals and other areas like in Melbourne, they do have senior specialists, so some of the senior staff are just generalists as well. So it's not a requirement to be a specialist depending on what you're applying for (B5 – Early Career Physiotherapist).

Reviewing this subsection as a whole, the majority of small/medium-sized hospitals participating in this research hoped to employ 'specialist generalists' who were multi-skilled in their discipline. In addition, many managers could not identify specific hospital programs that targeted allied health professionals' expertise; however, they were hopeful that CPD activities would add to their employees' existing knowledge and skills.

### **5.8.2 Informal learning: Collaboration with experts**

For many of the research participants at the small/medium-sized hospitals, a lack of informal learning opportunities was believed to affect allied health professionals negatively. Responses to questions about collaboration with experts correlated well with whether the participants discussed early-career or more experienced allied health professionals. In addition, many managers suggested that hospital programs for improving professional expertise best served recently graduated practitioners:

They've got their basic skills that have got them qualified to be licensed to practice, which is good then I think they need to have a process in place ... And again we do that pretty well for our graduates; there is a process of education and supervision in place that supports them in their day-to-day practice (B1 – Executive Manager MI).

In support of the managers' views, allied health professionals also commonly believed that their hospitals provided adequate training for early-career professionals. For example, a variety of experience in day-to-day work was made available for new graduates;

I guess when you are a new grad there's a lot to learn, not that I'm super experienced having only done it for five years, but in the first couple of years your obviously constantly looking out for extra courses they can do to develop your skills and knowledge-base (E8 – Early Career Physiotherapist).

All managers considered collaboration and knowledge sharing a problem for more specialised senior clinicians. For example, the most of highly qualified domain specialists had few expert colleagues with whom to collaborate, and this sometimes resulted in a reliance on associating with peers:

So we certainly tried to have people be involved with, if not someone who's got a higher level of skill than them, then a peer who at least would – they'd be able to challenge each other. But it's actually really tricky to do for some people because some people really are starting to be the 'go to' people (A3 – Physiotherapy Manager).

In all participating hospitals learning for early-career radiographers was facilitated by informal mentoring from more senior staff. In addition, the MI managers in small/medium-sized hospitals sometimes personally mentored novice and early career radiographers:

I will dedicate a good 90% of my time for the first three months to them because I want them to be up and running on their feet, so I don't have to supervise them all the time. So I do dedicate a lot of my own time into new staff, but not necessarily to all staff (C3 – MI Manager / Competent+ Radiographer).

Early-career radiography respondents were also occasionally able to supplement their learning opportunities by working with specialist medical practitioners who were more expert than themselves in many areas of knowledge and expertise:

Probably Cath Lab more ... because we're a hybrid lab we have cardiac half the week, Radiology half the week, and so you get to work side by side with cardiologists and ask things about drugs, and ask things about diseases that you wouldn't normally ... and the same thing with Radiology ... things that can get quite difficult, they're always there to answer questions ... (A5 – Early Career Radiographer).

Another alternative theme elicited from the interviews was an early career radiographer in a small/medium-sized hospital who was offered the opportunity to attend a more comprehensive practice. However, the offer was declined because of the travel required; "I have not taken it up, because it was pretty far ... no thank you, I'd rather just learn here" (C5 – Early Career Radiographer).

However, for more experienced radiographers in the small/medium-sized hospitals, there was no opportunity to work alongside more expert colleagues. Instead, they had to rely on training provided when having purchased new equipment:

We have a new CT machine, and we get a training applications specialist to come and do those things ... It's just occasionally, other than that ... We make do because it's a small department; I suppose (C3 – MI Manager / Competent+ Radiographer).

A further idiosyncratic interview response suggested that already expert allied health professionals working in regional hospitals may have difficulty finding suitable, locally available mentors:

I would like to [work with more expert colleagues] ... but the thing is that I'd have to go and, there's only a couple of radiographers in Melbourne that I'd actually want to go and work with or, I'd probably have to go interstate or international to really find those people ... given that opportunity, absolutely I'd do it, but those opportunities, especially in our area, are rare as hen's teeth (D4 – Competent+ Radiographer).

A common theme elicited from the physiotherapy respondents in this research was their belief that the best ways of learning included hands-on experience or observation of more skilled practitioners:

I think [you learn the majority of from] the practical, watching someone else do things and then talking with them. So if I could, I think my clinical placements I have learnt the majority of from in terms of my course that I am doing at the moment, going to clinics and talking to the practitioners about what they're doing and why they're doing it (D3 – Physiotherapy Manager / Competent+ Physiotherapist).

Another common theme discussed by early career physiotherapists was that they had ample opportunity to work with more experienced colleagues and took advantage of that when they felt out of their depth:

... I feel fairly confident with my management of a positional talipes, but I don't really know much about a fixed talipes. So I took the senior paediatric physiotherapist up there with me and then we did a co-treatment session which I found really beneficial because she was able to point out things that I wouldn't necessarily be looking for (A8 – Early Career Physiotherapist).

However, many of the more experienced physiotherapists working in small/medium-sized regional hospitals worked without supervision and without more expert practitioners with whom they could collaborate:

When you get somebody and it's just you, you have to get other avenues to work out when you've got questions and difficulties. You're right it's a different way of working rurally as opposed to in the city (C4 – Physiotherapy Manager / Competent+ Physiotherapist).

In addition, many of the more experienced physiotherapists working in the participating regional hospitals were already considered experts by their managers and therefore not provided opportunities to participate in worthwhile mentoring:

I actually focus on those newly graduated staff to have this full mentoring program and perhaps in some shape or form not able to create a creative solution for the more experienced staff with less hours. So those are a challenge for me ... they're 5% of the department (C2 – Executive Manager Physiotherapy).

However, there were occasional opportunities for more experienced physiotherapists in small/medium-sized hospitals to work alongside more expert practitioners:

So I have my own clinical supervision here, which happens every second month. So I have an hour with one of the other Grade 3 MUSK [musculoskeletal] Physio's and so that goes through your clinical load and any specific clinical situations that you want to sort of work through your reasoning and reflection and upskill (A7 – Competent+ Physiotherapist).

In addition to the little time spent with more experienced colleagues, some already experienced physiotherapists at large/referral hospitals described collaborating with people from other disciplines. Therefore, these physiotherapists were able to share expert interdisciplinary knowledge with specialist orthopaedic surgeons, neurologists and psychologists:

In that Advanced Practice role it's working through your clinical reasoning with the Orthopaedic surgeons who've been working for a long time and getting their perspective and then within the pain program dealing with the Psychology team who are experts in their area, and it's not ours, trying to working out things. So I guess it depends on how you see expert, but I'm probably lucky that I've got a few avenues of people that I know have got more experience in a particular area (A7 – Competent+ Physiotherapist).

I probably would go to depending on the situations, different specialists. You can, we can talk to orthopaedic surgeons, we can talk to neurologists. They're pretty good ones over here and sometimes the GP's if we're not sure who exactly to talk to. So there are some options (D8 – Competent+ Physiotherapist).

One of the less common responses from the interviews suggested that simply being a large regional hospital does not necessarily correspond to having more knowledgeable staff:

I think we make the mistake of thinking that at \*\*\*\*\* [a large regional referral hospital] there always going to be better and more experience than what we are in whatever it is, because they're a big hospital (E2 – Executive Manager Physiotherapy).

In addition, another individual response discussed the respondent's casual employment allowing work alongside expert colleagues at another large/referral regional hospital;

I've done relief work at the hospital at \*\*\*\*\* [large regional referral hospital], so there are some very good sonographers there. So you tap into what they know (E7 – Competent+ Sonographer).

In summary, responses regarding working alongside experts in their field correlated well with allied health professionals' levels of experience and expertise. Hospital programs aimed at improving professional expertise were primarily available to recent graduates. However, managers acknowledged that collaboration and knowledge sharing were typically inadequate for specialised senior clinicians. Therefore, domain specialists working in the participating regional hospitals seldom had expert colleagues with whom they could collaborate.

Many experienced physiotherapists working in small/medium-sized regional hospitals often worked as solo practitioners without the possibility of collaboration with experts. In addition, many experienced physiotherapists were considered experts by their managers and, therefore, not afforded mentoring opportunities.

### **5.8.3 Informal learning: Challenging practice**

The interview schedule guided the semi-structured interviews to explore on-the-job learning and the benefits of challenging practice identified during the literature review. Interviewees expressed various perceptions regarding whether they felt their professional practice was challenging. For example, many allied health professional respondents in the study working at the small/medium-sized regional hospitals discussed a lack of meaningful and challenging practice opportunities. In addition, some respondents working in those hospitals acknowledged the lack of challenge as being due to the size, regional location and the resulting reduction in healthcare services:

When we do theatre we don't do any major theatre basically; we run theatre five days a week, but we are restricted in what we can do because we don't have CCU [Cardiac Care Unit] or HDU [High Dependency Unit] to support people after. So sometimes the work could be not challenging enough, and certainly, people have said that (B1 – Executive Manager MI).

So there are elements of the work that they won't see, and I guess in that there's something for us to be thinking about. We need to expose some of the staff to what happens in other organisations (B2 – Executive Manager Physiotherapy).

However, some managers in small/medium size regional hospitals also believed that while the scope of practice is limited in regional hospitals, they pointed out the unique challenges arising from working in a small and disadvantaged community:

Yes, [work at this hospital provides challenging practice] because ... there is such a mix, there is a complexity to the clients, and we're in a significant area of disadvantage, so the complexity can often be the social complexity and how it impacts on their health (B2 – Executive Manager Physiotherapy).

... you're not seeing the same thing all the time; you're often having to think back ... I get a patient with MS, it's not like you've got lots of patients with MS in \*\*\*\*\* [this hospital]. I'll have one and then not see one for months and months ... I guess it's challenging in that you don't see things regularly, so when you get another presentation you have to think and go back over things (C4 – Physiotherapy Manager / Competent+ Physiotherapist).

Some allied health professionals working in small/medium-sized hospitals also believed that the need to be a generalist practitioner created the conditions for variety and challenging day-to-day practice:

Very great opportunities [for variety of experience in your day-to-day work]; in outpatients we essentially see anything that walk through the door, so it could be from a stroke to bronchiectasis to a shoulder reco [reconstruction] or whatever ... because of the patients I see really is what it comes down to ... because I'm often the one treating the complex rehab type patients, that's why it still challenging, which for me is good I quite enjoy it (B4 – Competent+ Physiotherapist).

Additionally, early career radiographers stated that working at small/medium-sized hospitals could still provide them with challenges because of their relative lack of practice experience:

Challenging enough to keep you on your toes, I would say. Just because ... it makes things interesting; I wouldn't say challenging, as in this is too hard ... it makes you think twice, makes you go and ask questions (C5 – Early Career Radiographer).

In contrast, an early career sonographer expressed the view that their previous allied health role as a radiographer was lacking in challenge, prompting a move to become a sonographer, which they found sufficiently challenging:

I feel like I did with Radiography... I think it was definitely the practice I was working at in \*\*\*\*\* [metropolitan city] it wasn't challenging, and maybe if I have been working at a trauma centre or somewhere where the x-ray range was wider, I may not have gone on to ultrasound ... But that's definitely what led me away from x-rays; I didn't see it as a challenge, and I wasn't getting the reward from my job (B3 – Early Career Sonographer).

Similarly, the executives and allied health managers working in the large/referral hospitals described their allied health professionals as being challenged by the day-to-day work. Nevertheless, challenges were derived from the variety of modalities offered:

I consider screening is just a part of x-ray, so if I haven't mentioned that, I include that and theatre and mobiles is all part of general. So they on a weekly basis, will be in CT and x-ray in some point, and then there is others that will do MRI as well; mammography; a couple that do ultrasound as well as all of that (D2 – MI Manager / Competent+ Radiographer).

You can have someone come in with a condition that you've only seen once before, it obviously makes it quite tricky to formulate a treatment plan, whereas if it is a condition that you've seen 100 of the you've got a much better idea of how they're going to respond to treatment ... so clinical experience is quite important (C4 – Physiotherapy Manager / Competent+ Physiotherapist).

The allied health participants in the large/referral hospitals also discussed the variety of their work, often describing practice as challenging. For example, the roster for the radiographers at a large/referral hospital required them to work in general radiography, MRI or the catheter laboratory, and they considered some of that work to be challenging:

... well certainly there's technically challenging ones and in some cases even emotionally challenging ... it's good from my perspective having a fair bit of experience in that field. You often will remember some similar event from a long time ago, and they got out of it this way or did it that way, and that's quite helpful (A4 – Competent+ Radiographer).

However, one interviewee suggested that despite being classified as a large hospital, the reduced service capabilities in regionally located hospitals resulted in a reduced scope of practice and available domain specialisations:

Well, we will be able to specialise in an area like outpatients musculoskeletal rehab or acute. We wouldn't be able to specialise in cardio-respiratory or neurologic patients or orthopaedic patients. We get a lot of them but not enough. We don't get such a breadth of those kinds of patients coming in (D9 – Early Career Physiotherapist).

Another less common theme flagged by respondents in the same large hospital was the suggestion that being in a regional hospital provided challenges in the variety of work available. This variety in caseload was often not available for allied health professionals working in metropolitan Melbourne and was seen as beneficial by some:

I think there is a quiet little blessing of working in a regional centre rather than a metropolitan because you do see a much greater variety of things ... Whereas if you worked at a more metropolitan hospital you may just see ortho stuff, and you may just see trauma. You fall into a speciality there where you may just not see a variety of things (D4 – Competent+ Radiographer).

A less common theme arose from experienced physiotherapists working at a large/referral hospital, who felt that their work did not challenge them. Therefore, to

satisfy their need for challenging practice, they made up for the perceived shortfall by seeking challenges to supplement their role:

No, I'd have to say no [regarding variety in practice at hospital] ... It's the same thing, I suppose, which is where I really like the workload that I have with the multiple roles that I have, you get that variety (A6 – Competent+ Physiotherapist).

Considering this section as a whole, many executives, allied health managers and professionals working in small/medium-sized regional hospitals felt that caseloads often lacked variety and did not challenge allied health professionals' capabilities. Some respondents believed this was due to their hospitals' size and regional location, reducing their scope of practice. However, the respondents also believed unique challenges arose from working in disadvantaged regional communities. For example, many early career allied health professionals said that their work provided significant challenges because they lacked experience. In addition, many experienced allied health professionals believed that being generalist practitioners created inherent variety and challenges.

In contrast, managers in large/referral hospitals described challenging everyday work for their allied health professionals, citing the variety of specialist domains available. The allied health professionals in these hospitals also discussed their work as challenging. For example, radiographers' rosters in one hospital required them to work in general radiography, MRI or the catheter laboratory. However, some of the more experienced physiotherapists at the same hospital did not feel challenged, satisfying their learning needs by supplementing work with non-work-related activities.

In conclusion, this chapter presents the thematic analysis of the findings in this study. In addition, the chapter details the findings attributable to hospital size, regional location, allied health professions, and individual professionals' expertise. Furthermore, the previous eight sections in this chapter have presented the cross-case analysis outlining the substantial similarities and differences in the interviewee's responses. The next and penultimate chapter of this thesis discusses the research analysis more extensively.



## **6 Discussion**

This research study aims to improve understanding of allied health professionals' continuing professional development (CPD) and how this interrelates with hospitals' knowledge management (KM). Previously in this thesis, the literature review in Chapter 2 encompasses works regarding the sociology of professions (described in section 2.1), adult education (described in section 2.2) and KM (described in section 2.3). These overlapping works of literature contribute to knowledge related to CPD generally and allied health professionals' CPD (described in section 2.4). The context of this study was described in Chapter 3, exploring the Australian healthcare system, Victorian public hospitals, regional healthcare and the allied health professions whose members have participated in this study. In addition, Chapter 4 describes the methodology and methods utilised and discusses the underpinning philosophical assumptions and research strategy. In addition, the chapter describes the research design and participant selection criteria. Finally, chapter 5 presents the findings of thematic analysis in the 'voice' of the participants drawing attention to the critical differences related to the non-probability sampling criteria and case selection (described in subsection 4.2.3). In addition, the analysis explores the participating hospitals' inner or outer regional geographical location, relative size and the allied health professionals in this study. The chapter structure is framed around responses to subsidiary research questions, which collectively contribute to answering the primary research question.

This chapter considers the research analysis of interview data (presented in Chapter 5) more extensively and derives insights through comparison to literature reviewed in Chapter 2. In addition, chapter sections elaborate on and highlight the substantial similarities and differences discovered in cross-case analysis. Hence, the presentation of sections reflects the thematic analysis chapter. In concluding the chapter, study findings are drawn together within a normative model of allied health professionals' CPD to provide a holistic representation of the processes involved.

### **6.1 Overall Conception of CPD**

During the semi-structured interview, participants discussed their broader impressions of CPD related to allied health professions. Their responses were in answer to a range of questions prepared by the researcher, which asked about their overall perception of CPD

and why allied health professionals should participate in CPD activities. In addition, this component of the interview schedule focused on the subsidiary research question:

- What understandings of CPD are held by managers and allied health professionals in regional Victorian public hospitals?

Definitions of CPD from the literature usually refer to planned programs to maintain and enhance knowledge and expertise, to meet professionals' learning needs (Madden & Mitchell, 1993; Sargeant et al., 2011). The overwhelming majority of interview respondents in this study suggested that CPDs' purpose was to stay up to date with profession related knowledge and skills. In addition, many study participants communicated their belief that CPD activities should be profession-specific or able to provide benefits for practice.

Much of the literature reviewed for this study proposes that CPD manifests as career-long or lifelong profession related learning (Australian Government, 2019; Billett, 2018; Bollington, 2015). Socio-economic imperatives and rapidly changing workplace environments in allied health disciplines make it necessary for practitioners to maintain currency with contemporary best-practice. In keeping with that proposition, this study found that most respondents believed that CPD should be designed or adopted as an ongoing career-long approach to learning. Hospital managers also described the need to maintain employees' profession related knowledge and skills; however, the majority entrusted allied health professionals themselves with responsibility for their CPD.

The current consensus in the literature suggests that all purposeful learning, including formal or informal learning activities, should be included in the definitions of CPD. However, few respondents proposed that CPD should include activities derived from practice. In contrast, the literature suggests that incremental 'micro genetic development' from on-the-job learning contributes significantly to an individual's professional development (Arievitch, 2017). Furthermore, Eraut (2011) quantifies the contribution of informal work activities to professional skill acquisition at between 70-90 per cent of all professional learning. However, many respondents in this study provided no evidence of having recognised the contribution of informal workplace learning. This finding supports an appraisal by Billett (2018), in which he identifies the missed opportunity for managers to maximise on-the-job learning. The following thesis section moves on from discussing

respondents' overall perceptions of CPD to considering the common factors they described affecting the planning of allied health professionals' CPD programs.

## **6.2 Motivations for CPD**

Based on respondents' positions and roles, the interview schedules used to guide discussion differed between hospital managers and allied health professionals. For example, managers were asked why they expected employees to undertake CPD, whereas allied health professionals were questioned about their motivations to undertake CPD activities. Regardless, this component of interviews sought to answer the subsidiary research question:

- What factors influence the planning of CPD programs undertaken by allied health professionals in regional Victorian public hospitals?

Executives and allied health managers commonly expressed that most allied health professionals fully engage in their CPD programs without needing managers' prompts. However, understanding the links between CPD planning and motivations of allied health professionals is necessary for this study. Practitioner motivations for participating in CPD likely influence how they are planned as well as activity preferences.

The literature regarding motivation considers developing each person's full potential as a high-order human need, partially satisfied by continually increasing professional expertise through CPD. For example, the need for 'self-actualisation' (Maslow, 1943) and 'growth' (Alderfer, 1972) described in theories of motivation convey a variety of motivations reflecting personal needs, values and interests (Morris, 2019; Rigby & Ryan, 2018). In addition, the literature suggests that motivations to undertake CPD are complex (Boshier & Collins, 1985; Wlodkowski & Ginsberg, 2017). The respondents in this study discussed various motivations for undertaking CPD without any noteworthy differences identified between the participating professions. Common motivations described by the participants included mandatory requirements to maintain professional registration, patient care, maintenance and enhancement of knowledge, evidence-based practice, professional advancement, satisfying personal interests, and meeting hospital needs. Therefore, this study's findings support the notion that allied health professionals have complex motivations for undertaking CPD. These identified motivations, which were

noted frequently among study respondents, will be discussed in the following eight subsections (6.2.1-6.2.8).

### **6.2.1 Mandatory CPD for professional registration**

Government bodies and professional associations aspire to have allied health professionals demonstrate currency with best practice (Billett & Hodge, 2016; Webster-Wright, 2009; Wenger-Trayner & Wenger-Trayner, 2015). For that purpose, Australian government regulations specify an average of 20 hours annually of mandatory CPD inputs for radiographers, sonographers and physiotherapists (ASAR, 2022; MRPBA, 2022; PBA, 2022). In addition, this input-based ‘sanctions model’ of CPD provides demonstrable compliance for allied health professionals’ registration, allowing a quantifiable and easily audited approach (Madden & Mitchell, 1993). However, many of the respondents in this study described the mandatory CPD requirements as somewhat of a ‘tick box’ exercise with compliance for some CPD activities based solely on the simplicity of providing evidence of attendance (described in subsection 5.2.1).

Even so, many allied health professional respondents in this study believed that CPD was more challenging in their regional setting. They described, for example, the return trip distance for many formal metropolitan-based CPD activities as the most significant obstacle. Hence, attending the face-to-face activities they prefer to requires a substantial additional time commitment (Stagnitti et al., 2005). For example, one participant described a “three-and-a-half-hour drive” to attend metropolitan-based CPD activities (D7 – Competent+ Sonographer).

The responses provided by executives and allied health managers commonly portrayed mandatory CPD requirements as a government-prescribed minimum contribution to profession related learning. In addition, many allied health professionals in this study reported undertaking more CPD activities each year than specified by mandatory requirements. However, two radiographer respondents identified mandatory CPD for professional registration as their primary motivation for undertaking CPD activities. The literature suggests that CPD programs should satisfy government registration requirements while also enhancing profession related knowledge and skills (Ramani et al., 2019). The findings of this study are consistent with that notion; mandatory CPD is not the primary motivation for the overwhelming majority of allied health professionals.

A range of other motivations was considered more important by the participants than the government-mandated levels of input hours of CPD activities.

### **6.2.2 Patient care**

Over and above the Australian government's mandatory minimum CPD requirements, most managers expected allied health professionals to undertake CPD activities to enable the best patient care possible (described in subsection 5.2.2). In addition, their typical responses included an expectation that CPD activities should incrementally improve patient treatment. However, one executive manager provided an idiosyncratic response about patient care, being unhappy with the status quo in Western Medicine, instead preferring a holistic and preventative approach (described in subsection 2.1.6) (Rosenberg, 2002; Warner, 2014). In addition, as a "bystander", this study participant thought allied health professionals were sometimes too focused on the patient's immediate problem at the expense of seeing them as a whole person (A1 – Executive Manager MI).

Both managers and allied health professionals reflected on the initial reasons they joined their respective professions. The conveyed feeling was that they could make a positive difference in people's health and well-being. Consequently, once in their professions, the allied health professionals typically engage with CPD to improve their profession related knowledge and skills. Being such a significant underlying motivation to the respondents in this study, it is unsurprising that the 'Taxonomy of Competency Domains for Healthcare Professions' of Englander et al. (2013) refers to patient care in three separate domains. The relevant domains include patient care, by providing compassionate, appropriate and effective patient care; learning knowledge for practice to apply to patient care; and practice-based learning, requiring healthcare professionals to "continuously improve patient care based on constant self-evaluation and life-long learning" (Englander et al., 2013, p. 1091).

However, several respondents expressed a less commonly held opinion. They believed that undergraduate training in patient care, built further upon through the experiences of the early career practice, was sufficient to understand patient care principles. Therefore, from their perspective, patient care training is unsuitable for inclusion in CPD programs. One of these participants still spoke about patient care models and client-centred practice being part of hospital-provided CPD sessions. However, while acknowledging its

importance, they felt there was too great a focus on patient care due to its significant weighting in undergraduate education.

### **6.2.3 Maintenance and enhancement of knowledge and skills**

The patient care discussed in the previous subsection was one purpose for allied health professionals engaging with CPD; maintaining and enhancing their profession related knowledge and skills would enable that goal (refer to subsection 5.2.3). Hence, in relation to suitable training focuses, this study also considers gaps in the literature regarding profession related knowledge and skills deemed critical to allied health practice (Chatti, 2012; Kothari et al., 2011; Orzano et al., 2008). Furthermore, the sociological construct of ‘professions’ usually applies to occupations with specialised knowledge and skills (Freidson, 2001; Pekkola et al., 2018; Popkewitz, 1994; Richardson, 1999). The allied health professionals in this study must demonstrate a solid commitment to CPD and maintain currency in their specialised domains throughout their careers.

The managers in this study acknowledged the Australian Health Practitioner Regulation Agency (AHPRA) as responsible for validating allied health professionals’ eligibility for professional registration and being ‘work-ready’. In addition, they expected allied health professionals to possess knowledge and expertise appropriate for their years of experience. The managers in this study also expected their employees to utilise CPD programs to maintain and enhance their knowledge and skills. For example, the large/referral hospitals hoped their staff would ‘up-skill’ as their careers progressed.

Allied health professionals discussed maintaining and enhancing their knowledge and skills through CPD. In addition, some respondents suggested that demonstrating independence in practice was also essential in regional settings, where specialist doctors were often not always available. Finally, many of the physiotherapists in this study discussed relying on clinical reasoning in everyday practice, which required maintaining and enhancing research-based knowledge to underpin the efficacy of their clinical treatment decisions.

### **6.2.4 Evidence-based practice**

The allied health professionals in all three disciplines described their wish to use research-based knowledge to guide evidence-based practice in their everyday work (refer to subsection 5.2.4). Furthermore, Australian federal and state governments have long

acknowledged the need to improve evidence-based practice, especially in regional Australia, with limited access to CPD activities for allied health professionals (Department of Health, 2012). Any improvements in evidence-based practice addressing the effectiveness of allied health practice should contribute to more appropriate and cost-effective healthcare for nearly one-third of Australians living in regional areas (Department of Health, 2012). Previous research regarding why allied health professionals are motivated to undertake CPD activities found that progression towards evidence-based practice was typically included (Murphy & Calway, 2007; Pool et al., 2016; Stagnitti et al., 2005). In addition, evidence-based practice aligns with the Practice-Based Learning and Improvement domain which suggests there is a need to “appraise and assimilate scientific evidence” as an essential element of CPD programs (Englander et al., 2013, p. 1091) (refer to subsection 2.4.9).

It was a common theme among managers and allied health professionals that effective CPD activities would result in more evidence-based practice and improve its efficacy. However, although evidence-based practice was a significant reason why CPD programs were supported, some respondents thought there was too little available evidence supporting practice in physiotherapy. Therefore, physiotherapists appraised the quality of evidence as a hierarchy, combining research evidence, professional experience and clinical reasoning; however, well-conducted research is given the most credence. Andragogy theory supports this reflective approach, bringing together new evidence from credible sources, and changing beliefs and practices based on assessing new information’s credibility (Bandura, 2001).

Finally, the radiographers and sonographers in this study also described efforts to implement best practice techniques in the research literature. However, some of their attempts to apply evidence-based practice were overridden by doctors, relying more on their expert medical opinion. Andragogy principles also explain this acquiescence by suggesting that professional knowledge is co-constructed in response to workplace culture and behaviours within their community of practice (CoP) (Goller & Billett, 2014).

### **6.2.5 Professional advancement**

Previous research found that professional advancement and specialist status development contribute to allied health professionals’ motivations to participate in CPD programs (Murphy & Calway, 2007; Pool et al., 2016; Stagnitti et al., 2005). In this study, the

participating allied health professionals detailed various motivations for undertaking CPD activities, including a desire for professional advancement (described in subsection 5.2.5). In addition, it was common for hospital managers to support allied health professionals in their desire for career advancement, including seeking specialisation and credentialed qualifications. Furthermore, some managers suggested that professional advancement should also focus on future leadership or managerial roles. Many allied health managers offered their support to facilitate professional advancement, understanding that it would also benefit the hospital where they worked.

Various managers, excluding those in the largest referral hospital, noted that in regional hospitals, being too specialised was sometimes a disadvantage, instead preferring 'generalist specialists'. When discussing what a 'generalist' means, physiotherapy managers described practitioners as having competence in multiple traditional specialties. Therefore, this proved a limiting factor for allied health professionals seeking to achieve domain specialisation in small/medium-sized regional Victorian hospitals, ultimately impacting staff retention. Regardless, managers in some of these hospitals often supported CPD activities leading to domain specialisation, assisting with the current staffing needs of their hospital, despite them knowing it would be at the expense of long-term retention. In contrast, one medical imaging (MI) manager was more proactive in supporting radiographers' desires for professional advancement and increasing their potential future employment opportunities, knowing they were still likely to move to larger hospitals.

#### **6.2.6 Personal interest**

The outcome of the thematic analysis found that professional advancement and personal interest go together as motivations for participating in CPD programs (described in subsection 5.2.6). When managers were asked why their staff participated in CPD programs, common responses included that allied health professionals preferred to focus on topics of interest to them. Furthermore, hospital managers encouraged people to participate in CPD activities that interested them, on the condition that their interest was compatible with hospitals' service needs. As might be expected, many allied health professionals in this study also stated that their interests have changed throughout their careers, and they prefer CPD to be relevant to their interests at the time.



### **6.2.7 Hospital needs**

Managers and allied health professionals in the study were mindful of the need to satisfy hospital needs in selecting CPD activities (described in subsection 5.2.7). The potentially conflicting interests of professional organisations and their employees became the focus of research after the 1980s. Therefore, researchers shifted their attention from exploring the structure of professions to investigating tensions between professional organisations and their employees. Consequently, the system of professions literature utilised open systems theory to explain the relationships between organisations and various professionals (Ayala, 2020; Freidson, 2001; Pekkola et al., 2018) (described in subsection 2.1.3). For example, in providing context for this study, the regional Victorian hospitals equate to the modern organisational forms discussed in the literature. This can be understood in terms of Freidson (1988), who described three functional systems affecting tensions between modern organisations and professions. They included market forces, the bureaucracies of the state and large organisations, and a third functional system or ‘third logic’ of professional associations influencing their members.

Management theorists have long recognised that worker expectations are changing where people often wish to have a better work/life balance. In healthcare, reaching this balance must consider both the organisational goals of hospitals and healthcare needs of hospital patients, while also allowing service providers opportunities for personal and professional growth (Izzo & Withers, 2002). This type of human resource management (HRM) approach will become increasingly important in the future to account for the interests of multiple stakeholders including those employees recognised as an indispensable group and valued business asset (Hassan et al., 2022). Satisfying the business needs of hospitals in addition to meeting the CPD needs of allied health professionals, including work-life balance, has been found necessary for the recruitment and retention of good employees in a competitive labour marketplace (Izzo & Withers, 2002). Good work practices here will reduce staff turnover which results in lowering business costs of recruitment, training while raising productivity. Satisfied employees also may reduce the need for high cost of ‘locum tenens’ or casual short-term employees used to address staff shortages in regional hospitals.

When discussing the relationships between hospitals and the various professionals they employ, managers in the study believed they could find synergy between hospital needs and allied health professionals’ CPD. Furthermore, the managers thought this necessary

to ensure that professional staff deliver safe and effective services to hospital patients. Managers suggested that CPD contributed to increasing evidence-based practice. In addition, all executive and allied health managers encouraged allied health professionals' participation in CPD activities aligned with hospital service needs. For example, in all the regional hospitals in this study, radiographers who wished to specialise in sonography were supported by managers because there was alignment with hospitals' desire to introduce or maintain ultrasound services. In addition, many allied health professionals in this study understood that their preferred CPD activities should align with hospital needs and goals before support would be forthcoming from hospital managers.

An idiosyncratic theme emerged from the interviews with one executive manager who established a performance 'dashboard' linking efficiency and effectiveness measures to supports offered for individuals' CPD programs; "for their own professionalism and for our disciplines to improve towards the goals of the directorate" (A2 – Executive Manager Physiotherapy). Therefore, this response suggests that hospitals employing allied health professionals have a management dilemma, simultaneously controlling professionals while developing their profession related knowledge. However, as previous authors/researchers suggested, the factors that define contemporary professions, including esoteric knowledge, skills, and a solid commitment to CPD, make practitioners less amenable to stringent control measures (Evetts, 2013; Freidson, 2001). In addition, managers of professional organisations such as hospitals must balance business imperatives against the 'noble work ethic' of healthcare professions (Freidson, 2001; Popkewitz, 1994). Nevertheless, hospital managers also have an opportunity to exploit the ideology of professionalism to encourage a commitment to the CPD among their allied health professionals.

### **6.2.8 Regional location can be demotivating**

Although an uncommon theme expressed by allied health professionals, a small number of respondents said that regional location and smaller hospital size diminished their motivation to undertake CPD (described in subsection 5.2.8). For example, two radiographers suggested their regional location was demotivating. In contrast, numerous other interviewees suggested that their motivation to participate in CPD programs increased because of their relative professional isolation.

In summary, allied health professionals discussed various motivations for participating in CPD programs. These motivations include mandatory CPD for professional registration; delivering high-quality patient care; maintaining and enhancing profession related knowledge; their preference for evidence-based practice; a desire for professional advancement; and satisfying personal interests and hospital needs.

### **6.3 Responsibility for CPD**

The respondents in this study included hospital executives, allied health managers, and allied health professionals. These people discussed whom they believed were responsible for planning and executing CPD programs and their expected contributions. The following three subsections consider these issues (6.3.1 - 6.3.3).

#### **6.3.1 Allied health professionals primarily responsible for CPD**

The social importance of allied health professions reflects the reciprocal exchange of benefits between society and members of these professions. Furthermore, allied health professionals accept the moral responsibility for maintaining and enhancing their specialised knowledge and practical expertise (Susskind & Susskind, 2018). Therefore, the social context of professions directly influences allied health professionals' CPD. As hospital employees, the allied health professionals in this study expect to interact with other parties involved in their CPD, such as government bodies, professional associations and work colleagues.

The participants in this study were unanimous in believing that individual allied health professionals were morally obliged to manage their CPD (described in subsection 5.3.1). This feeling of obligation encompasses planning their programs, participating in CPD activities and demonstrating that they satisfy government requirements. Furthermore, the findings of this study show that allied health professionals accept personal responsibility for maintaining their profession related specialist knowledge, thus supporting the findings of previous research (Quinn et al., 1996; Richardson, 1999). In addition, some respondents suggested that members of professions should continually question their practice and look for ways to improve their efficacy. However, as found in previous research, many respondents lacked a strategic approach to their CPD, missing the opportunity to acquire competencies that would otherwise enable them to maximise the benefits to their practice and careers (Poell & Van Der Krogt, 2016).

### **6.3.2 Hospitals share responsibility for CPD**

Despite the expectation that allied health professionals shoulder the primary responsibility for CPD, all respondents in this study considered that hospitals also shared responsibility for profession related learning (described in subsection 5.3.2). However, the executive managers felt they should not be responsible for controlling allied health professionals' CPD programs and delegated this task to allied health managers. For example, one executive manager from a background unrelated to their current MI responsibilities admitted having little familiarity with profession related issues. Therefore, they suggested that this should preclude them from having control of the CPD programs of radiographers and sonographers.

On the other hand, allied health managers also felt obligated to encourage allied health professionals in their profession related learning and facilitate participation in CPD activities. This approach aligns with one of the main goals of organisational KM, which is facilitating the diffusion of knowledge throughout hospitals. Consequently, successful KM should increase effectiveness and efficiency, thus benefiting clients and hospitals alike (Rubtcova & Pavenkov, 2018; Sanchez, 2006). However, the respondents in this study were decoupled regarding hospitals' KM efforts to encourage social relationships for knowledge-sharing (Mittal & Kumar, 2019). For example, the MI professions of radiography and sonography had no access to hospital-organised in-service training or CPD meetings either before or during the data collection period. In contrast, the participating hospitals' physiotherapists had regular hospital-provided clinical CPD meetings, which were also eligible for government mandatory CPD requirements.

### **6.3.3 Professional associations' role**

The findings in this study are that allied health professionals and hospitals share responsibility for allied health professionals' CPD. However, government and professional associations are also increasingly concerned with allied health professionals demonstrating their currency with best-practice knowledge and skills (Billett & Hodge, 2016; Webster-Wright, 2009; Wenger-Trayner & Wenger-Trayner, 2015). In addition, allied health professional associations encourage their members to participate in structured CPD programs. The executive and allied health managers expressed that allied health professionals' CPD programs in regional settings were improved when professional associations provided locally available learning and networking opportunities.

The three professions participating in this study were radiography, sonography and physiotherapy, and their respective professional associations were ASMIRT, ASA and APA (described in section 3.3). These professional associations require their members to implement self-determined CPD programs utilising reflective practice to assess their knowledge and expertise deficits. However, the majority of respondents in this study believed that while allied health professionals might primarily be responsible for their own CPD programs, professional associations should also shoulder some responsibility (described in subsection 5.3.3). In addition, many respondents praised allied health professional associations for networking opportunities and presenting research findings at professional conferences and peer-reviewed journals. However, while acknowledging the need for high-quality education, many respondents also believed too few regionally located CPD activities were available for professional association members.

#### **6.4 Competencies considered necessary for good practice**

The executives, allied health managers and professionals discussed their perceptions of essential professional knowledge and skills required for allied health professionals' work. The subsidiary research question to be explored in the following subsections:

- Which competencies do hospital managers and allied health professionals consider necessary for good practice?

The initial university education of allied health professionals focuses on the knowledge, skills and attributes necessary for competent practice. After completing profession-specific training, newly qualified allied health practitioners should be competent in their limited scope of professional practice. However, after graduating, self-directed CPD requires allied health professionals to determine their own knowledge deficiencies and the goals and objectives of their personalised CPD program (Sachdeva, 2016).

The notion of 'competencies' is one way to classify the profession related knowledge, skill, and attributes (described in subsection 2.4.9) (Englander et al., 2013). However, an example provided by one respondent in this study distinguishes between hard and soft competencies: 'hard' technical practice competencies versus 'soft' more personalised attribute-related competencies. Furthermore, the soft competencies generally refer to higher-level generic skills and personal attributes affecting interpersonal relationships, communications, and social awareness (Johnston & McGregor, 2004; O'Byrne &

Dell'Aquila, 2014; Stefanovski, 2020). Therefore, competency-based classifications have been proposed in the literature to address discrete skill-sets in CPD programs, thus combining profession related knowledge and practical skills (Englander et al., 2013; Hager, 2017). In addition, competency frameworks attempt to organise and group individual but complementary generic skill-sets required for professional practice into 'domains of competence' that develop capabilities in response to an uncertain future (Campbell et al., 2010; DHHS, 2016).

Englander et al. (2013) propose a competency framework that articulates a list of common core competencies among healthcare competency frameworks, building on previous ACGME and ABMS frameworks (described in subsection 2.4.9). In addition, the authors describe eight competency domains, including patient care; medical knowledge; interpersonal and communication skills; professionalism; practice-based learning and improvement; systems-based practice; interprofessional collaboration; and personal and professional development (Englander et al., 2013). The interview schedules for this study apply these competency domains to competencies the respondents thought necessary for allied health professional practice and worthy of inclusion in CPD programs. In summary, hospital managers and allied health professionals in this study generally considered high-quality patient care, knowledge for practice, interpersonal and communication skills, professionalism, and interprofessional collaboration as competencies necessary for good practice. The following five subsections discuss the related literature and common themes drawn from interview responses (6.4.1 - 6.4.5).

#### **6.4.1 Patient care**

Allied health professionals are crucial in providing hospital diagnostic and therapeutic patient care services (AHPA, 2015). Unsurprisingly, previous research among allied health professionals found patient care a critical motivation for participating in CPD programs (Dowds & French, 2008; Micallef & Kayyali, 2019). In this study, the majority of managers believed the purpose of allied health professionals' CPD was for them to provide the best patient care possible (described in subsections 5.2.2 & 5.5.1). Englander et al. (2013) describe patient care as a competency to "provide patient-centred care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health" (p. 1091) (described in subsection 2.4.9).

The majority of respondents considered all competencies involving high-quality patient care crucial, aligning with government and professional associations' priorities. In addition, many allied health professionals in this study describe patient care as the underlying reason they joined their professions and the drive behind improving the efficacy of their practice. However, one of the less common themes came from respondents who considered their undergraduate training regarding patient care sufficient and an unnecessary competency for inclusion in CPD programs. However, relatively few respondents expressed this opinion and still acknowledged the importance of patient care as a competency for high-quality practice.

#### **6.4.2 Knowledge for practice**

Allied health professionals' formal and informal CPD activities contribute to developing their profession related knowledge and expertise. This knowledge and expertise combine learning from tertiary study, CPD and experiential practice from day-to-day work experiences (Markauskaite & Goodyear, 2017). Regardless of the source of knowledge, learning occurs through the subjectively perceived consequences following the application of new knowledge (Bitterman, 2006; Usman & Ogbu, 2019). Englander et al. (2013) describe knowledge for practice as a competency to “demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioural sciences, as well as the application of this knowledge to patient care” (p. 1091).

Respondents in this study commonly included knowledge for practice when discussing which competencies were worthy of being included in allied health professionals' CPD (described in subsection 5.5.2). Most allied health professionals notionally grouped all CPD competencies as 'knowledge for practice'. However, allied health professionals' CPD programs frequently preference clinical knowledge and technical skills. For example, hospital managers and practitioners discussed research evidence as constantly changing, requiring profession related knowledge to be updated regularly. In addition, the majority of respondents discussed the need for the synergy of theoretical knowledge with practical experience before attaining sufficient expertise.

#### **6.4.3 Interpersonal and communication skills**

One definition of CPD that relates to healthcare professions and is appropriate for this study defines CPD as addressing not only hard technical competencies, “but also additional professional practice competencies (e.g. communication, collaboration,

professional)” (Sargeant et al., 2011, p. 167). In support of that premise, the competencies discussed by respondents in this study were often higher-level ‘soft’ generic skills, including personal attributes such as interpersonal communications (Johnston & McGregor, 2004; O’Byrne & Dell’Aquila, 2014; Stefanovski, 2020). Englander et al. (2013) describe interpersonal and communication skills as a competency “that result[s] in the effective exchange of information and collaboration with patients, their families, and health professionals” (p. 1091).

As discussed previously in this thesis, enabler models of KM utilise facilitating factors to enhance knowledge-seeking and sharing behaviours in professional employees (described in subsection 2.2.3). These social and technological enabling KM models are predicated on explicit and tacit knowledge and incorporate the social aspects of interpersonal communication. In addition, they suggest that improved social relationships will positively influence knowledge-seeking and sharing (Nonaka, 1994; Reber, 1989). For example, a desire to understand and exploit profession related knowledge in contemporary healthcare organisations prompted research into a more appropriate KM model. As a result, the Orzano et al. (2008) model incorporates subjective influences affecting KM adoption in healthcare, with helpful relationships, a culture of trust, effective communications, and active social networks among the influential enabling factors identified (described in subsection 2.2.2).

While discussing the knowledge and skills considered crucial for allied health professionals’ practice, executive and allied health managers frequently suggested that CPD programs should include soft skills such as communication skills. In addition, most allied health professionals value highly developed interpersonal and communication skills for clinical practice (described in to subsection 5.4.3). These respondents explained the need to tailor communications for discussions with patients or work colleagues.

In addition to participating in formal CPD activities, informal learning opportunities are available to allied health professionals through ‘communities of practice’ (CoPs) (described in subsection 2.4.7) (Agrawal & Joshi, 2011; Brown & Duguid, 1991; Nonaka, 1994; Wenger-Trayner & Wenger-Trayner, 2015; Wenger, 1990). CoPs are founded on the ‘social nature of human learning’ (Wenger, 2010). In addition, the concept of ‘legitimate peripheral participation’ is also part of CoPs and requires sharing knowledge between practitioners within a hierarchy of members, centrally located experts and peripherally positioned novices (Lave & Wenger, 1991). Therefore, participation in CoPs



requires effective interpersonal and communication skills. Furthermore, by improving communication skills, CoPs reduce feelings of isolation and increase empowerment and self-advocacy (Barbour et al., 2018; Henwood et al., 2017; Wilson et al., 2017).

#### **6.4.4 Professionalism**

Society expects allied health professionals to display ‘professionalism’ by being knowledgeable, skilful, trustworthy, and exhibiting exemplary behaviour in their everyday work (described in subsection 2.1.2) (Burns, 2019a; Evetts, 2013; Pekkola et al., 2018). The notion of professionalism is of such importance that Freidson (2001), when describing the functional systems of society, included the ‘market’, the ‘bureaucracy’ and the ‘third logic’ of professional associations and their wider social influence. However, the social elevation of allied health professions suffers from societies’ perception of a lack of transparency when present in hospitals, potentially weakening the ‘noble work ethic’ expected of traditional professions (Freidson, 2001; Popkewitz, 1994).

Nevertheless, hospitals employing allied health professionals can exploit the ideology of professionalism to encourage a strong commitment to CPD programs. Englander et al. (2013) describe professionalism as a competency to “demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles (p. 1092) (described in subsection 2.4.9).

When discussing professionalism as a competency considered essential for allied health professionals’ practice, all managers in this study believed that demonstrating acceptable behaviours was necessary for good practice. In addition, most allied health professionals expected their work colleagues to behave professionally (described in subsection 5.5.4). Furthermore, they acknowledged the need to comply with social expectations, government regulations, and professional codes of conduct. Therefore, the majority of allied health professionals believed that professionally acceptable behaviour was crucial to good practice. However, they also indicated that firmly held attitudes and values might be difficult to change in some people.

It was common among managers and allied health professional respondents to be sceptical about the inclusion of professionalism as a suitable topic for CPD programs. Furthermore, many respondents believed that successful enculturation regarding professionalism provided in university training and professional practice rendered it unsuitable for inclusion in CPD programs (described in subsection 5.5.4). The goals of

professionalism include understanding profession related knowledge and clinical skills, being highly attuned to ethical issues, and responding to changing societal norms of behaviour (Houle, 1961, 1980). In addition, professionalism implies an expectation that allied health professionals are trustworthy. However, a standout example brought to light by the respondents of one participating hospital told of a human resources intervention responding to staff concerns that unprofessional behaviour was pervasive in their hospital. The hospital's managerial response was to establish a committee that distilled staff feedback into four professional values: teamwork, respect, accountability, and compassion.

The majority of respondents in this study included professionalism and exhibiting acceptable attitudes and behaviours as competencies essential for good practice and a component of an implied social contract. However, professionalism was not considered worthy of inclusion in CPD programs due to its high priority in undergraduate training and allied health professional enculturation.

#### **6.4.5 Inter-professional collaboration**

CPD programs can equally be applied to address 'hard' competencies related to knowledge for practice and 'soft' competencies related to professional practice, such as interprofessional collaboration (Sargeant et al., 2011). Although underappreciated, the value of informal learning through collaboration with expert healthcare professionals facilitates vicarious experience and understanding from other professionals' perspectives (Allen et al., 2019; Bandura, 1986a; DeTormes Eby et al., 2014; Eraut, 2011). Therefore, the influence of regional location and hospital size in this study has been found to affect the feasibility of hospitals providing opportunities for their staff to collaborate with expert colleagues. In addition, the literature suggests that a lack of collaboration might negatively affect professional learning (Eraut, 2011). Englander et al. (2013) describe interprofessional collaboration as a competency to "demonstrate the ability to engage in an interprofessional team in a manner that optimizes safe, effective patient- and population-centred care" (p. 1092) (described in subsection 2.4.9).

Common responses in this study regarding the knowledge and skills considered crucial for allied health professionals' work included inter-professional collaboration (described in subsection 5.5.5). For example, a few executive managers considered that allied health professionals could improve their knowledge about inter-professional collaboration,

benefiting the effectiveness and efficiency of their day-to-day work. Furthermore, many allied health managers disapproved of knowledge silos, preferring that staff better understand hospitals' workflows. In addition, most allied health participants reported various amounts of inter-professional collaboration while working at other hospitals. Finally, it was common for allied health professionals to describe inter-professional collaboration as essential for everyday work and to believe that CPD relating to workplace collaboration might be beneficial. The following section discusses hospitals' KM approaches and the interrelationships with allied health professionals' CPD.

## **6.5 Hospital Knowledge Management and CPD**

The systems and processes that hospitals use to exploit knowledge are collectively known as knowledge management (KM) (described in section 2.2). A frequently cited definition of KM acknowledges the link between explicit and tacit knowledge: "The managed knowledge includes explicit, documented knowledge, and tacit, subjective knowledge" (Rowley, 1999, p. 418). The primary goal of KM is to reduce knowledge deficits by diffusing new knowledge throughout an organisation (Rubtcova & Pavenkov, 2018). Therefore, hospital managers are responsible for implementing processes that encourage and facilitate knowledge-seeking, sharing, and beneficial social relationships (Mittal & Kumar, 2019; Sanchez, 2006). This study explores whether hospital managers promote social interactions to facilitate tacit knowledge sharing. In addition, this section of the discussion chapter will further analyse respondents' semi-structured interviews, considering the subsidiary research question:

- How does the choice between either a personal, organisational or hybrid approach to KM in regional Victorian public hospitals impact the CPD undertaken by allied health professionals?

The common approaches to KM preference either explicit or tacit knowledge; however, exploiting both may be necessary to implement KM systems in hospitals successfully. A managerial understanding of the nature of knowledge is needed for hospitals to benefit fully from their employees' knowledge-seeking and sharing behaviours. However, there are two fundamentally different perspectives of KM. Firstly, the organisational KM approach relies on documented explicit knowledge such as written policies, protocols and procedures. In contrast, a personal KM approach relies on profession related knowledge known to individual allied health professionals, with knowledge sharing enabled through

planned social interactions. In this study, participants were encouraged to share their experiences regarding KM and its impact on their profession related knowledge and CPD programs. The following four subsections consider these issues (6.5.1 - 6.5.4).

### **6.5.1 An organisational approach to knowledge management**

Advocates of an organisational KM approach typically espouse a ‘near tangible view’ of knowledge which assumes that the tacit knowledge of individuals can be made explicit (described in subsection 2.2.1) (Hadjimichael & Tsoukas, 2019; Nonaka, 1994; Nonaka & Takeuchi, 1995). However, tacit knowledge is considered intangible because it is difficult to articulate, particularly when tacit knowledge relates to expert profession related knowledge. Nevertheless, this study explores whether organisational or personal knowledge KM approaches are advocated by managers or found to be functioning in the participating hospitals.

It was a common belief among hospital executives and allied health managers that profession related knowledge should be available as up-to-date protocol and procedure manuals (described in subsection 5.6.1). Most executive managers in this study intended that protocol manuals should be used to guide everyday practice. In addition, an executive manager from a large/referral hospital suggested that protocol procedure manuals should define contemporary best practice and be ‘living’ documents, updated when knowledge-seeking processes unearth new best practice techniques. In contrast, some managers suggested that it was difficult to document allied health professionals’ knowledge as it was tacit and personally held.

Allied health professionals’ responses confirmed that protocol procedure manuals were available in the MI professions of radiography and sonography. However, there were mixed responses regarding whether allied health professionals referred to these manuals to guide their practice. For example, radiographers and sonographers at all the participating hospitals knew that protocol manuals were available; however, they reported that the manuals were seldom consulted after publication. In addition, participants reported that protocols were not updated regularly and not treated as ‘living’ documents. Finally, documented protocol and procedure manuals were often reviewed in a cycle coinciding with hospital accreditation, suggesting that completing these documents may be more a tick box exercise than a legitimate attempt to follow an organisational KM approach.

### **6.5.2 The constraining influence of medicine**

The comprehensive written protocol manuals available to radiographers and sonographers in this study would often build on legacy documents from the radiology service provider. Therefore, the MI protocols for the hospitals in this study have been authorised by radiologists without necessarily involving local allied health professionals in their development (described in subsection 5.6.2). In addition, any allied health professionals' proposed best-practice changes to protocol manuals still required consultation with supervising radiologists, who could either rubberstamp or veto suggested amendments. Allied health professionals were submissive in this regard, justifying radiologists' influence in MI practice protocols because the legal onus of responsibility was on the radiologists themselves.

Sonographers in this study discussed their purported increased accountability, allowing them greater independence in day-to-day practice. However, increased autonomy in everyday practice still requires meeting radiologists' protocol requirements. Consequently, the supervising radiologist's preferences continue to constrain radiography and sonography practice, and respondents from those professions acknowledged these practice restrictions.

### **6.5.3 Personal approaches to knowledge management**

Tacit knowledge, which is "knowing of more than you can tell" (Polanyi, 1961, p. 466), may be challenging to put into words. Therefore, a personal knowledge approach toward KM suggests that tacit understanding is part of all knowledge and outside of conscious awareness and cannot always be made explicit (Hadjimichael & Tsoukas, 2019; Reber, 1989; Tsoukas, 1996). In addition, some authors further differentiate 'complex' tacit knowledge as related to expert knowledge and skills (Abidi et al., 2005). For hospitals, implementing the personal knowledge approach to allied health professionals' practice requires allowing them time for reflection and creating appropriate social interactions (Nonaka, 1994; M. Smith et al., 2009). Therefore, these social interactions enable profession related learning opportunities through CoPs (Lave & Wenger, 1991; Wenger-Trayner & Wenger-Trayner, 2015; Wenger, 2010) (described in subsection 2.4.7).

As discussed in this thesis, there is a strong relationship between hospitals' KM approaches and individuals' profession related learning. However, in contrast to other models of KM, 'enabler models' seem most relevant to this study as they seek to identify

motivations for participation in knowledge seeking and sharing in an organisational context (described in subsection 2.2.3). Furthermore, various enabler models incorporate social aspects of interpersonal relationships based on the premise that improved social interactions and communication will positively affect knowledge-seeking and sharing behaviours (Nonaka, 1994; Reber, 1989).

In contrast to MI professions, physiotherapy departments had relatively few explicit protocols and procedures, with physiotherapists depending more on personally held profession related knowledge. Reliance on personal knowledge involved frequently drawing on exemplars from experience and the anecdotal advice of their colleagues. Nevertheless, managers and physiotherapists discussed the existence of post-surgical guidelines and clinical pathways that specialist medical practitioners prescribed. In addition, the physiotherapists believed the broad range of patient presentations required a broad range of treatment options based on their clinical reasoning. The managers and physiotherapists believed their day-to-day practice needed to combine research evidence, professional experience and clinical reasoning.

It was common for executive managers to expect personal networks to facilitate knowledge sharing. However, favouring a personal approach to hospitals' KM was also facilitated through regular in-service CPD sessions, which allowed social interaction among the physiotherapists. In comparison, MI respondents stated that there had been no in-service or staff meetings.

Respondents in this study suggest that KM at the participating hospitals include both organisational and personal approaches (described in section 5.6). However, among participating professions, the apparent propensity to favour aspects of one KM approach over the other was sometimes misleading. For example, in the MI professions of radiography and sonography, each discipline had explicit and well-defined protocols and procedures. However, radiographers and sonographers commonly discussed their inclination not to rely on explicitly documented protocols in their day-to-day practice. Finally, all hospitals participating in this study have what the Sanchez (2006) contingency model describes as hybrid forms of KMs, utilising both organisational and personal knowledge approaches. However, Sanchez (2006) also believed that successful models of KM required managers to understand organisational needs and employees' knowledge-sharing behaviours.

#### **6.5.4 How best-practice knowledge is shared**

This subsection explores hospitals' efforts to control and exploit knowledge through KM and how this affects profession related knowledge-sharing. Enabler KM models correlate facilitating factors in profession related knowledge-seeking and sharing (described in subsection 2.2.3). For example, KM models of social and technological enablers propose that improving relationships positively influences knowledge-seeking and sharing (Fu & Lee, 2005; Nonaka, 1994; Reber, 1989). Various other models of this type incorporate the social aspects of learning; for example, Orzano et al. (2008) described enabling factors necessary for successful KM systems. Furthermore, the model suggested that hospital managers must understand and exploit profession related knowledge. Finally, the Orzano et al. (2008) model explores subjective factors, including supportive relationships, effective communication, and active social networks.

The executive and allied health manager interviewees in this study were asked about the contribution of hospital processes to the expertise of allied health professionals. Many management respondents explained that it was usual to initially try and recruit allied health professionals with appropriate knowledge and skills. However, most managers discussed a lack of formal knowledge-sharing arrangements in their hospitals. Some managers discussed informal ad hoc learning opportunities related to work experience regarding unusual patient presentations. However, none of the radiographers or sonographers knew of formal professional knowledge sharing in the discipline. In addition, no regular in-service CPD meetings were being held in any of the participating hospitals' MI departments during the data collection period of this study. However, informal knowledge-sharing was occurring, including passing messages, intra-organisational staff emails and unplanned staff interactions. In contrast, physiotherapists at all participating hospitals except for one small/medium-sized hospital had regular in-service CPD sessions organised by their managers. Therefore, this allowed them to share new knowledge with their colleagues.

Although the allied health professionals in the small/medium-sized hospitals participating in this study had relatively few interactions with other working colleagues, they still relied on anecdotal information shared among professional colleagues. In addition, sharing anecdotal information also occurred in the large/referral hospitals' write-up room. However, the allied health professionals did not assume the shared information to be

infallible, judging their knowledge provider's reliability before incorporating it into their everyday practice.

## **6.6 Planning of CPD Programs**

The discussion in this section explores the allied health professionals' planning of CPD programs coupled with the influence of hospitals' policies. Typical CPD schemas portray cycles of reflection, planning, learning and evaluation. Healthcare professionals have previously considered it insufficient to simply select and undertake CPD activities without implementing a planned strategy (Dowds & French, 2008). However, research suggests that some allied health professionals continue to neglect strategy and planning for their CPD programs (Henwood & Huggett, 1999; Karas et al., 2020; Phillips, 2011; Schenk, 2014). This study explores the gap identified in the literature regarding allied health professionals' CPD planning.

Furthermore, the findings may improve CPD planning and implementation, benefiting allied health professionals' future practice. The respondents in this study were encouraged to discuss factors that significantly influenced their CPD program planning and their use of reflection in day-to-day practice. Therefore, the subsidiary research question for this section of the interview was:

- What factors influence the planning of CPD programs undertaken by allied health professionals in regional Victorian public hospitals?

Numerous common themes emerged from the interviews, including hospital accreditation; hospital-provided CPD; support for CPD; reflective practice; long-term strategic planning; local availability of CPD; online learning; formal and informal CPD; interdisciplinary CPD; and recruitment and retention issues. Therefore, these themes will be discussed in the following nine subsections (6.6.1 – 6.6.9).

### **6.6.1 Hospital accreditation**

In Victoria, all public hospitals must participate in accreditation governed by the Australian Health Service Safety and Quality Accreditation (AHSSQA) standards. AHSSQA is responsible to the government for formulating and publishing National Safety and Quality Health Service (NSQHS) safety and quality standards that hospitals must meet to be accredited (ACSQHC, 2021; DHHS, 2019). In addition, the DHHS is responsible for monitoring the accreditation of hospitals and dealing with non-compliance



issues. Therefore, public hospitals must comply with the NSQHS safety and quality standards on a three-yearly accreditation cycle (Willis et al., 2020).

When questioned about employees' CPD programs, hospital executives and allied health managers discussed being mindful of hospital accreditation requirements, which include annual performance reviews for allied health professionals (described in subsection 5.7.1). Most managers suggested that performance reviews encourage a more strategic approach to CPD. In addition, many of the managers intended to assist with planning and facilitating CPD programs in the short term. However, many allied health managers and professional respondents described the performance review as the only planning undertaken and a token involuntary exercise that lacked meaningful contribution to planning their CPD programs. In addition, a less common theme emerging from the interviewees' responses was that assistance with CPD planning might improve if it were more informal and frequent.

#### **6.6.2 Hospital-provided CPD**

Many participants included hospital-provided CPD as a factor influencing the planning of their CPD programs. In healthcare professions, employers may offer in-service training and CPD sessions to their staff to maintain and enhance their profession related knowledge and skills. However, responses from the interviews typically aligned with the respective professions when discussing whether their hospitals provided formal in-service CPD activities for allied health professionals (described in subsection 5.7.2). For example, during the data collection period of this study, the hospitals' radiographers and sonographers had no recent formal in-service training or CPD sessions. Furthermore, this lack of in-service training was the same regardless of hospital size or relative regional location.

In contrast, all physiotherapy managers expected their hospitals to provide formal in-service activities for their allied health professionals. Except for one small/medium-sized hospital, these activities were typically provided in monthly in-service training and CPD sessions and informed by professional staff needs analysis surveys. However, at another small/medium-sized hospital, some respondents believed these in-service CPD sessions targeted early career physiotherapists because the content was more appropriate for new staff. Therefore, more experienced physiotherapists felt it necessary to find more appropriate external CPD activities.

### **6.6.3 Hospital support for CPD**

Allied health professionals participating in this study also included the support provided by the hospital in their deliberations regarding the CPD activities they would attend (described in subsection 5.7.3). The interview schedule prompted discussion about how participants' hospitals encouraged or facilitated their CPD programs. For example, employers may offer financial or other support as part of salary packages in healthcare professions to allow allied health professionals to attend external CPD opportunities. The CPD events were most commonly in metropolitan Melbourne or interstate cities. In addition to hospital-provided CPD activities, all executives and allied health managers detailed other support measures for allied health professionals' CPD programs. For example, managers frequently discussed wishing to support their employees' goals, believing it necessary to maintain their competence to practice. In addition, supporting their goals was thought to contribute to staff recruitment and retention.

Therefore, it was common among respondents to detail the support available for CPD to include five days of study leave annually; however, this was part of allied health professionals' EBAs. In addition to paid leave for CPD activities, it was common at all participating hospitals to make monetary contributions towards allied health professionals' CPD activities, including registration fees, accommodation and sometimes travel expenses. However, to reduce the cost imposed on their hospital and department, managers in one large/referral regional hospital sought additional CPD funding through RWAV [Rural Workforce Agency Victoria] and SARRAH [Services for Australian Rural and Remote Allied Health]. Finally, a few allied health managers also discussed helping employees with CPD planning and identifying appropriate CPD activities for some staff.

### **6.6.4 Reflective Practice**

In this study, many allied health professionals conveyed the outcomes of their own reflective practice when considering CPD planning (described in subsection 5.7.5). Although reflections regarding healthcare practice decisions are presumed to predate the phrase 'reflective practice' as applied in the literature, the concept defines learning from self-examination of practice experiences and the coexisting cognitive processes (Dubé & Ducharme, 2015; Eaton, 2016). Effective reflective practice is critical for allied health professions, with conscious critical reflection encouraging a re-evaluation of clinical decisions and promoting more in-depth learning (McDermott et al., 2018; Plack & Greenberg, 2005). In everyday practice, reflection often occurs after facing an ambiguous

clinical problem in what Schön (1991) distinguishes as ‘reflection-on-action’, allowing thoughtful review of an event to guide future practice.

In addition to individual practitioner’s reflective practice, allied health associations representing the professions in this study encourage their members to reflect on their practice and use this as a component of their CPD programs (ASAR, 2022; MRPBA, 2022; PBA, 2022). However, for allied health professionals, implementing the personal knowledge aspects of CPD and hospitals’ KM requires time for reflection on practice and the social interactions with other people that allow sharing of ideas (Nonaka, 1994; M. Smith et al., 2009). Therefore, this study explores whether hospitals allow appropriate time and places for reflective practice and knowledge-sharing. In addition, reflective practice in hospitals can include information sharing at clinical in-service CPD meetings and informally in the workplace. Finally, reflective practice allows people to identify the knowledge gaps necessary to plan their CPD programs.

Allied health professionals’ reflective practice can also focus on observing the work of their colleagues and learning vicariously from others’ mistakes (Koshy et al., 2017). However, a significant amount of reflective practice arises from reactive responses to near-miss situations and medical errors that harm patients. McDermott et al. (2018) found that informal reflection in small groups provides more relaxed participation, stimulating more in-depth reflections with colleagues. In addition, deliberative group reflections develop the knowledge of the group, benefit practice, and improve healthcare delivery (Börjesson et al., 2015; McDermott et al., 2018). However, group reflective practice can be undermined by hospital cultures or sub-cultures that discourage reflection because they discourage admitting mistakes (Börjesson et al., 2015). Unfortunately, people ‘construct’ their professional knowledge in response to these ill-considered workplace cultures and CoP’s norms (Goller & Billett, 2014). Nevertheless, reflection benefits allied health professionals who wish their practice to be demonstrably evidence-based.

The experiences of MI allied health professionals differed markedly from those of physiotherapists regarding proactive episodes of reflective practice. For example, an executive manager responsible for MI believed staff meetings would allow reflective practice and discussion with colleagues; however, those meetings had not happened for many months. In addition, no radiographers or sonographers reported group in-service training or reflective practice sessions being available in any of the participating hospitals. In contrast, formal clinical in-service training and CPD meetings, including

group reflective practice, were held regularly in all hospitals' physiotherapy departments, with just a single exception.

### **Relying on reactive reflection**

The allied health professionals in this study included their own reflective practice when considering CPD planning; however, not all reflection was proactive. The interviews of executives and allied health managers found that they expected allied health professionals' reflective practice to be a part of everyday work routines. In addition, managers commonly believed that although it was a challenging skill to master, they considered it critical to maintaining professional currency. Many interviewees described their reflective practice as informal and subconscious, one describing 'mini ah-ha moments' with learning from experience (A3 – Physiotherapy Manager).

The respondents in this study discussed using reflective practice as part of their day-to-day work processes. However, it was common among allied health professionals that reflection was typically in response to adverse patient outcomes. Adverse outcomes were logged via the Riskman® risk-management platform, which one executive manager acknowledged as time-consuming. In extreme examples, hospital managers instigated mortality and morbidity (M&M) processes, requiring allied health professionals to participate in a formal reflection process regarding an alleged medical mistake. However, 'reflection-in-action' and 'reflection-on-action' coexist; therefore, reflection can occur consciously with deliberate critical reflection, enabling more in-depth understanding and challenging old assumptions (Eaton, 2016; Schön, 1991).

### **6.6.5 Few examples of long-term strategic planning**

This study found that although allied health professionals espoused reflective practice, it seldom resulted in long-term strategic planning in their CPD programs (described in subsection 5.7.7). The definitions of CPD from the literature typically mention that strategic planning is crucial to the successful implementation of profession related learning programs, for example, "to a plan formulated with regard to the needs of the professional, the employer, the profession and society" (Madden & Mitchell, 1993, p. 3). In addition, many of the management respondents suggested that mandatory annual performance reviews attempted to instil a strategic approach to CPD in allied health professionals. However, this study found that many allied health professionals view the performance review as a tick box exercise that did not contribute to their real-life CPD

programs. Finally, few allied health professionals described having any long-term strategy for their CPD programs, relying instead on ad hoc CPD opportunities.

There were seemingly genuine efforts of allied health managers attempting to aid the planning of allied health professionals' CPD programs while aligning them with hospital knowledge needs. For example, many physiotherapy managers implemented skills and knowledge audits throughout first-year physiotherapists' rotations. These audits allowed identifying knowledge and skills gaps and facilitating physiotherapists' CPD planning. In addition, at one large/referral hospital, there was an annual audit of all physiotherapists' skills to identify knowledge shortfalls compared with the hospital's range of services.

Among the allied health professional respondents, four physiotherapists who worked at the two largest hospitals in this study described being strategic regarding their CPD. The strategies revolved around a five-year plan based on analysing strengths and weaknesses to guide their selection of CPD activities. In addition, the four physiotherapists with a long-term strategy discussed the need for learning relevant to their changing caseload. In contrast, an uncommon theme was disclosed by a few late-career radiographers and sonographers preparing for retirement, who believed that their late-career stage meant it was unnecessary to have any strategy regarding CPD.

#### **6.6.6 Local availability**

Another factor allied health professional respondents mentioned influencing their short-term planning for CPD was the lack of local availability of CPD activities (described in subsection 5.7.8). This study agrees with previous research suggesting that regional healthcare professionals prefer formal face-to-face CPD activities (Allen et al., 2019; Benwell & Fowler, 2017; Stagnitti et al., 2005). In addition, this study supports previous findings that there is limited availability of CPD activities in regional locations (Edward et al., 2019; Horn et al., 2019; Stagnitti et al., 2005; Ward & Tham, 2020). Most allied health professionals believed their regional location disadvantaged their access to formal metropolitan-based CPD activities. In addition, this belief was held regardless of the actual distance from metropolitan Melbourne. Allied health professionals often cited return-trip travel time as the problem, for example, a three-hour return trip drive versus a seven-hour return trip drive. Therefore, regardless of the distance or time involved, the subjective impression inhibits their attendance at those CPD activities. Nevertheless,

some respondents still lauded metropolitan CPD programs, pointing out the benefits of networking.

Many respondents in this study believed that the professional associations representing radiography, sonography and physiotherapy were attempting to reduce regional disadvantage by offering more local CPD activities. Therefore, although this study agrees with previous findings of the limited availability of CPD activities in regional areas, this barrier is being addressed by active interventions by professional associations. Therefore, the local availability of CPD activities encouraged more regionally-based allied health professionals to attend. However, a more individual theme emerged from an early-career radiographer who suggested they attended locally available CPD activities simply because they were the easy option.

### **6.6.7 Online learning**

As described in the previous subsection, allied health professionals prefer formal face-to-face CPD activities; however, access to them is limited in regional areas (Edward et al., 2019; Horn et al., 2019; Stagnitti et al., 2005). Furthermore, previous research has found that the uptake of online learning in regional areas has been less than expected (Mathur et al., 2005; Micallef & Kayyali, 2019; Sandars et al., 2007). However, research into the effectiveness of CPD models suggests that online learning can satisfy specific objectives, such as developing new skills which cannot be learned through workplace experiences (Billett, 2015). In addition, online learning activities are now included among the eligible mandatory CPD activities required for professional registration (described in subsection 5.7.9). For example, in 2017, ASAR's CPD program was revised to include online and self-directed learning, recognising inequitable access to formal learning activities for regional sonographers (ASAR, 2022).

Accordingly, the interviews with allied health professionals in this study discussed various formal and informal CPD activities participated in over the previous year, including online education and Webinars. Many allied health participants described the Internet as helpful for finding profession related knowledge. For example, the radiographers described using Internet browsers to find information and accessing profession related websites such as Radiopedia and AuntMinnie for obscure anatomical questions. In addition, physiotherapists discussed reading online peer-reviewed journal

articles, undertaking formal university studies, participating in profession related social media and hosting webinars.

#### **6.6.8 Formal and informal mix**

As discussed, comprehensive definitions of CPD encompass all formal and informal CPD activities related to working successfully in professions (described in section 2.4).

Lifelong education was historically limited to formal didactic teaching at universities, conferences or workplaces. Formal CPD activities include scientific conferences, educational meetings and workshops, but formal teaching activities only contribute to learning intermittently throughout a person's career. (Allen et al., 2019; Horn et al., 2019). However, the era of adult education for workplace learning has been supplanted by comprehensive views of learning that include formal and informal purposeful learning.

In contrast to the sporadic contributions of formal education, informal aspects of allied health professionals' CPD programs regularly contribute to developing profession related knowledge and expertise. For example, many government bodies and allied health professional associations now allow informal activities to contribute to CPD programs, encouraging variety in members' learning (ASAR, 2022; MRPBA, 2022; PBA, 2022). Informal activities include reading journals, mentoring, and involvement with CoPs (Allen et al., 2019; Horn et al., 2019). In addition, Billett (2018) describes informal learning 'affordances' from employers, including facilitating challenging workplace practice and working alongside colleagues, especially those with more expertise.

The allied health professionals in this study discussed their preferences for either formal or informal CPD activities (described in subsection 5.7.10). For example, many respondents describe it as more straightforward to provide evidence of formal CPD activities for mandatory requirements and the difficulty of providing evidence of informal CPD activities. However, some more experienced allied health professionals prefer informal and unstructured CPD activities that better meet their learning needs. It was also a shared experience for many allied health professional respondents in this study to find that their preference for either formal or informal CPD activities would change according to their work-related and social circumstances.

Informal learning from workplace practice, otherwise known as 'situated learning', has long been the most common learning method for many occupations, with knowledge and skills acquired in the workplace. However, for many contemporary professions, on-the-

job learning is still necessary and may also lead to a more authentic understanding and better integration of new knowledge and skills (Billett, 2014). Benner's (2004) research found that the advanced beginner stage in the Dreyfus et al. (1986) skill acquisition model was typically achieved after three years of practice. These early-career allied health professionals have relatively little practical experience and rely on rules-based learning. However, with more experience, competent professionals begin focusing on pertinent features and increase their understanding, learning to synthesise knowledge and skills, trusting their intuition and replacing the rules with an understanding of the salient aspects of practice. Finally, experts intuitively understand their practice through an extensive repertoire of practice and no longer rely on rules-based learning.

The findings of this study agree with previous research that suggests profession related learning is available through CoPs (described in subsection 2.4.7) (Wenger, 1990, 2010). The literature typically defines CoPs as an informal group that increases their knowledge and expertise through regular interaction (Agrawal & Joshi, 2011; Brown & Duguid, 1991; Nonaka, 1994; Wenger-Trayner & Wenger-Trayner, 2015). However, the critical mass required to form such groups is somewhat limited in this study's small/medium-sized hospitals, with many respondents describing working alone and having little interaction with their colleagues. In addition, although the contribution of everyday work is central to improving professionals' expertise, this study found that early career allied health professionals were provided affordances to work with more expert colleagues. However, many of the more experienced allied health professionals noted that they were often not challenged in their practice or afforded the opportunity to learn alongside expert practitioners. Therefore, some executives and allied health managers acknowledge the situation as a problem for which they see no simple solution.

Therefore, this study agrees with research that suggests informal learning's contribution to professional learning is frequently neglected by managers (Eppich et al., 2016; Eraut, 1994, 2000, 2004, 2007, 2011). Furthermore, missing opportunities to collaborate with allied health professionals who are more expert than themselves denies this group the possibility of tacit knowledge transfer through vicarious experience (Allen et al., 2019; Bandura, 1986a; DeTormes Eby et al., 2014). As a final point here, although the regional location and low staff numbers of small/medium-sized hospitals reduce the opportunities to collaborate with colleagues, the large/referral hospitals fared little better in providing these affordances to their staff.



### 6.6.9 Interdisciplinary CPD

The complex practices and technology used in healthcare today have resulted in specialisation in many allied health occupations, historically known as ‘professions supplementary to medicine’ (Ayala, 2020; King et al., 2015; Larkin, 1978; Nancarrow & Borthwick, 2021; Rosenberg, 2002; Warner, 2014; Yielder, 2014). Various professions play a crucial role in healthcare, with allied health professions such as those in this study providing diagnostic and therapeutic services (AHPA, 2015). Historically, some allied health professions’ knowledge originated in the medical profession. For example, the knowledge required in the early days of radiography was primarily from research in disciplines such as physics and medicine (Decker & Iphofen, 2005). In addition, medical practitioners from various disciplines were extremely influential the early days of sonography in Australia. Furthermore, the radiographers already working in MI could more easily enter the sonography profession, partly because the profession related knowledge seemed an extension of radiographers’ pre-existing knowledge. Finally, physiotherapy’s origins were in massage therapy, becoming a discrete profession in the 20th century (Chipchase et al., 2006).

As discussed in this thesis, the common theme among respondents was that the essential knowledge and skills for allied health professionals’ practice included inter-professional collaboration (described in subsection 5.5.5). In addition, many managers discourage knowledge silos preferring inter-professional collaboration regarding work and CPD activities. For example, allied health professionals generally prefer locally available educational opportunities; however, they sometimes seek alternative interdisciplinary CPD activities that are available locally. It was also common for allied health professionals to believe that collaboration with other professionals for CPD might ultimately benefit patients’ healthcare experiences.

This study found that a less common theme influencing allied health respondents’ short-term planning for CPD was the local availability of interdisciplinary CPD activities; however, many allied health professionals in this study described limited opportunities (described in subsection 5.7.11). Nevertheless, one physiotherapist attended sessions convened by radiologists and orthopaedic surgeons to explore different perspectives for the sake of their patients; however, the available interdisciplinary CPD was often irrelevant to their profession. Instead of formal meetings, some allied health professionals preferred informal interdisciplinary discussions with friends and colleagues, exploring

overlapping knowledge between their disciplines. However, another individual theme came from a radiographer who suggested that interdisciplinary CPD was discouraged at their hospital.

In summary, a range of approaches to the planning of CPD was evident among the allied health professionals. However, they commonly mentioned factors that influenced their planning of CPD programs. These factors included hospital-provided CPD activities, reflective practice and identifying gaps in knowledge, reliance on reactive reflection, local availability of CPD activities, choices regarding formal and informal CPD activities, and the availability and uptake of interdisciplinary CPD opportunities. In addition, much of the planning discussed among the allied health professionals was short-term. Finally, very few allied health professionals had a long-term strategic plan guiding their selection of CPD activities, relying instead on ad hoc opportunities.

## **6.7 Model of Allied Health Professionals' CPD**

Research regarding allied health professionals' CPD typically explores individual aspects of CPD in isolation, such as motivations or barriers to participation (described in subsections 2.2.3, 2.3.1 - 2.3.3, 2.4.3 & section 3.2) (Murphy & Calway, 2007; Stagnitti et al., 2005; Tham & Ward, 2016). This study has applied a more holistic approach, bringing together CPD planning, CPD activities, professional competencies, profession related knowledge and expertise, and the role of reflective practice. The results of this study are represented in the Model of Allied Health Professionals' CPD depicted in Figure 15.

The secondary research question is addressed with the model:

2. How can the findings of this research be represented to improve the CPD of allied health professionals and knowledge management (KM) in regional Victorian public hospitals?

The normative model conceptualises this study's findings, abstracted in a heuristic framework with the interrelated components of CPD. In addition, the model depicts reflective feedback loops indicating deliberative planning of CPD, determined from the respondents' experiences with CPD activities, identified knowledge gaps or healthcare outcomes from previous practice. The model's components are described in the following nine subsections (6.7.1 - 6.7.9).

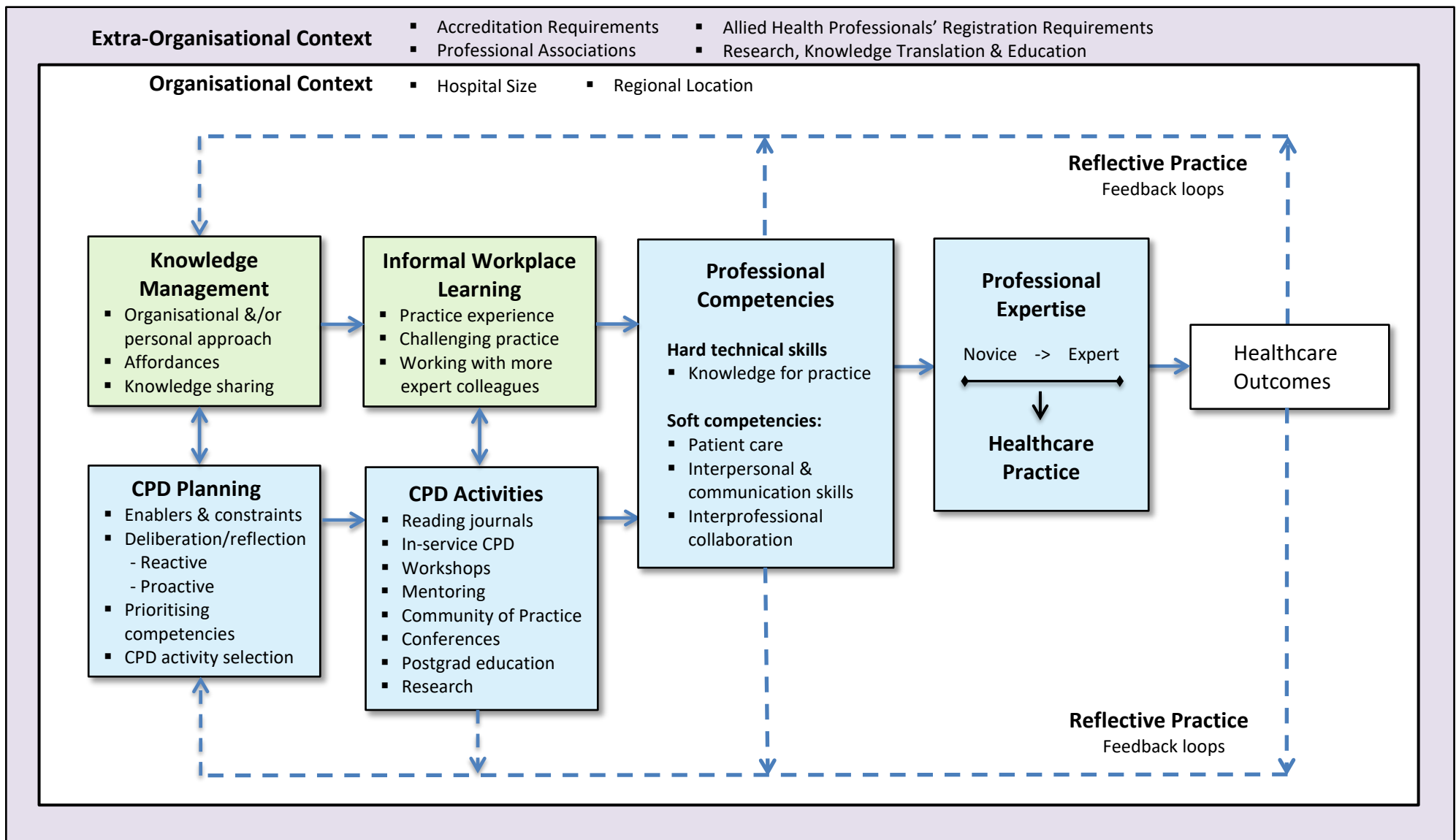
### **6.7.1 Extra-organisational context**

As stated, the model of allied health professionals' CPD developed from the findings of research presented in this thesis (see Figure 15) details an input-process-output heuristic framework. Allied health professionals' CPD occurs within an extra-organisational context in the model, depicted as the outermost set with a mauve background in Figure 15. For example, one of the roles of the Australian government is to provide funds for state-run public hospitals, which provide the workplaces for the respondents in this study (AIHW, 2020b; Daire et al., 2020). In addition, federal and state government funding and regulations influence the extra-organisational context, including hospital accreditation, allied health professionals' registration and the influence of the allied health professional associations (described in section 3.1).

### **6.7.1 Organisational context**

Within the extra organisational context, organisational contexts are significant to allied health professionals working in Victorian public hospitals, including regional location and hospital size, depicted in the model with a white background in Figure 15. As discussed previously, there are disparities in access to healthcare between regional and metropolitan populations (refer to sections 3.2 - 3.4) (Ward & Tham, 2020). In addition, the problems associated with regional healthcare services include inequity due to having fewer healthcare professionals in regional areas and the distances involved for patients attending specialised healthcare services (AIHW, 2019b; Duckett & Willcox, 2015). Most healthcare professions have declining availability of healthcare professionals to work in regional Australia (AIHW, 2020a). Therefore, regional allied health professionals face barriers to working in regional hospitals, including high workloads and reduced access to profession related learning, with most CPD being metropolitan-based (Berndt et al., 2017; Department of Health, 2019; Stagnitti et al., 2005; Tham & Ward, 2016).

Figure 15 Model of Allied Health Professionals' CPD



### **6.7.2 Knowledge management**

Part of the organisational context of hospitals that employ allied health professionals are the effect of hospitals' KM. The KM systems hospitals use to exploit knowledge primarily aim to reduce knowledge gaps and disseminate explicit knowledge throughout the organisation, as depicted in the model in Figure 15, with a green background (described in section 2.2) (Rubtcova & Pavenkov, 2018). In addition, hospital managers are responsible for encouraging and facilitating social interactions that enable tacit knowledge sharing (Mittal & Kumar, 2019; Sanchez, 2006). In this study, respondents shared their experiences regarding KM and its impact on their CPD programs. The different perspectives of KM discussed focus on organisational or personal approaches or a hybrid combination of the two.

The organisational KM approach assumes that tacit knowledge can be made explicit (refer to subsection 2.2.1) (Hadjimichael & Tsoukas, 2019; Nonaka, 1994; Nonaka & Takeuchi, 1995). However, tacit expert profession related knowledge is difficult to articulate. Therefore, implementing the personal knowledge approach in hospitals requires time for reflection and enabling social interactions through CoPs (described in subsection 2.4.7) (Lave & Wenger, 1991; Nonaka, 1994; M. Smith et al., 2009; Wenger-Trayner & Wenger-Trayner, 2015; Wenger, 2010). All hospitals in this study have what Sanchez (2006) describes as hybrid forms of KM, combining both organisational and personal knowledge approaches. In addition, hospitals' efforts to control and exploit knowledge through KM also affect profession related knowledge-sharing behaviours (refer to subsection 2.2.3). Therefore, enabler KM models propose that improving relationships positively influences profession related knowledge-sharing (Fu & Lee, 2005; Nonaka, 1994; Orzano et al., 2008; Reber, 1989).

### **6.7.3 Informal workplace learning**

Hospitals' KM consequently affects workplace learning. Informal learning frequently contributes to allied health professionals' work-related knowledge and expertise, as depicted in the model with a green background in Figure 15. The allied health professionals in this study discussed various preferences for either formal or informal learning activities. Many respondents found it easier to provide evidence of formal CPD because they generally come with a certificate of attendance. Others discussed the problems of providing evidence for informal CPD. In contrast, more experienced allied health professionals described informal CPD activities that better meet their profession

related learning needs. In addition, many allied health professionals in this study discussed their preference for formal or informal activities changing depending on career stage and personal circumstances.

Modern-day humanistic learning perspectives require self-reflection, self-development, and authentic learning opportunities (Rumianowska, 2020). Furthermore, social learning theories suggest that knowledge develops from CoP experiences and through social interactions in the workplace (Bandura, 1971, 1986b; Lave & Wenger, 1991; Wenger-Trayner & Wenger-Trayner, 2015; Wenger, 1998). Along with learning from experience, Billett (2018) also describes employer affordances contributing to profession related learning, including providing challenging practice and collaboration with more expert colleagues. Furthermore, existentialism, SCT and situated learning theories agree that collaboration with professional colleagues and purposive grouping allow vicarious learning opportunities (Bandura, 2005; Billett, 2014; Hughes et al., 2019). Finally, social learning theories suggest that developing a person's full potential is a high-order human need, satisfied by increasing profession related knowledge and expertise through self-improvement and CPD programs (described in subsection 2.3.3).

Although everyday work contributes to allied health professionals' expertise, this study found that early-career professionals' workplaces afforded collaboration with more experienced colleagues. However, already competent allied health professionals discussed not being challenged in day-to-day practice and not being able to work and learn alongside expert practitioners. In addition, some managers acknowledged the *status quo* as a problem, denying these allied health professionals access to tacit knowledge transfer.

#### **6.7.4 CPD planning**

Allied health professionals' learning is primarily discretionary, and this study explores their CPD planning, as depicted in the model with a blue background in Figure 15.

Deliberative planning related to CPD programs usually involves reflection and planning, with reflective practice crucial to a successful strategic approach to CPD (Dowds & French, 2008; Englander et al., 2013; Eraut, 2000; Plack & Greenberg, 2005).

Furthermore, to fully realise the benefits of profession related learning, allied health professionals must strategically plan their CPD programs (refer to subsection 2.4.10) (Dowds & French, 2008; Eddy et al., 2015; Eraut, 2001; Henwood & Huggett, 1999; Poell & Van Der Krogt, 2016). However, few allied health professionals in this study had

any long-term strategy, relying instead on ad hoc CPD opportunities. Finally, selections are made regarding which CPD activities will satisfy the profession related learning needs of each allied health professional after considering the current scope of practice and career trajectory.

### **6.7.5 CPD activities**

Whether allied health professionals' CPD programs are ad hoc or strategically planned, they must select and undertake CPD activities, as depicted in the model with a blue background in Figure 15. Mandatory CPD inputs for professional registration allow for eligible formal and informal activities to meet CPD requirements (described in subsection 2.4.6) (ASAR, 2022; MRPBA, 2022; PBA, 2022). The allied health professionals in this study discussed participating in a wide range of formal and informal CPD activities in the 12 months before being interviewed (refer to section 5.4). The CPD activities included reading journal articles, attending in-service CPD, attending workshops, mentoring less experienced allied health professionals, participating in communities of practice, attending scientific conferences and undertaking research. Moreover, early-career allied health professionals participating in this study focused on developing clinical knowledge and skills. In contrast, more experienced practitioners focus on capabilities that may advance their careers.

### **6.7.6 Professional competencies**

After graduating, allied health professionals must determine their knowledge gaps and personalise their CPD program to advance their knowledge and expertise (Sachdeva, 2016). Professional competencies can assist with developing a CPD program and are an example of classifying profession related knowledge, skill, and attributes, as depicted in the model with a blue background in Figure 15. (described in subsection 2.4.9) (Englander et al., 2013). Some respondents in this study distinguish between 'hard' technical practice competencies versus 'soft' generic attribute-related competencies. The soft competencies refer to higher-level generic skills and personal attributes (Johnston & McGregor, 2004; O'Byrne & Dell'Aquila, 2014; Stefanovski, 2020). Therefore, using professional competencies as a framework is proposed to address discrete skill-sets in CPD programs, thus combining profession related knowledge and practical skills (Englander et al., 2013; Hager, 2017). Utilising the eight competency domains of Englander et al. (2013) to guide discussions with the respondents, they articulated the competencies considered necessary for allied health professionals' practice (described in

subsection 2.4.9). The common competencies thought necessary for allied health professional practice and worthy of inclusion in CPD programs included patient care, knowledge for practice, interpersonal and communication skills, and interprofessional collaboration.

### **6.7.7 Professional expertise and healthcare practice**

The CPD programs of allied health professionals contribute to developing professional competencies combining profession related knowledge and expertise, as depicted in the model with a blue background in Figure 15. In addition, the efficacy and efficiency of performing professional tasks relate to workers' knowledge, expertise and attributes in specialised domains. Cognitive psychology explanations of profession related knowledge and skill acquisition are often conceptually represented as stage-models or continuums. For example, the commonly cited Dreyfus et al. (1986) stage-model of skill acquisition anticipates step-wise progression, advancing from 'novice' to 'expert' throughout a professional career (refer to subsection 2.4.8). As discussed, allied health professionals' CPD derives from explicit or tacit knowledge sources. In addition, the contributions of different knowledge types and knowledge and skill acquisition models are compatible, with novices learning more from explicit rules-based information. In contrast, people with increasing expertise progressively learn more from their exposure to tacit knowledge from experts. Therefore, vicarious learning from skilled colleagues becomes increasingly crucial as professional expertise increases.

### **6.7.8 Healthcare outcomes**

The study in this thesis explores the interrelationship between hospitals' KM and allied health professionals' CPD, which influences the efficacy of healthcare, thus contributing to patient health outcomes, as depicted in the model with a white background. In addition, addressing the inadequacies of allied health professionals' CPD should reduce Australia's medical diagnostic error rates (described in section 3.2) (Graber, 2013). Many examples regarding reflective practice provided by respondents of this study revolved around adverse events related to the practice of allied health professionals. In those instances, exploring best-practice options through reflective practice is necessary to understand whether changes might improve patients' healthcare outcomes.

The discussion in this chapter has expanded on the themes identified from the cross-case analysis, combined with this study's literature review. Furthermore, the framing of this



chapter has been around answering the subsidiary research questions and providing a review of the substantive similarities and differences between themes discovered in cross-case analysis. Finally, this chapter presented a normative model of allied health professionals' CPD, distilled from the research study presented in this thesis. The concluding chapter of this thesis follows in Chapter 7. It answers the two primary research questions and specifies the contributions of this study to the theory and practice of allied health professionals' CPD and hospitals' KM. In addition, the study's limitations are acknowledged, and recommendations for future research are proposed.

## **7 Conclusion**

The challenges facing the Australian healthcare system and state operated public hospitals have implications for all members of Australian society. In addition, people in regional communities suffer disadvantages due to having typically poorer health and lacking the benefits of healthcare services available at large tertiary referral hospitals in metropolitan cities. However, maintaining and enhancing the knowledge and skills of allied health professionals may reduce the inequality challenging people living in regional Australia.

Community expectations regarding healthcare in Australia include receiving up-to-date, evidence-based practice by healthcare professionals. To satisfy this expectation, healthcare professionals maintain currency by participating in self-directed continuing professional development (CPD) programs. The research study described in this thesis aimed to improve the understanding of allied health professionals' CPD. The preceding discussion chapter combined knowledge from the literature review (Chapter 2) and the thematically analysed data from respondents' interviews (Chapter 5). This concluding chapter of the thesis reviews the key parameters influencing allied health professionals' CPD programs, including regional location, hospital size and the impacts affecting the three professions included in this study (subsections 7.1.1 - 7.1.3). In addition, the primary and secondary research questions are answered (section 7.2, Table 11 & Figure 15). Furthermore, this chapter outlines the contributions of this research to the theory underpinning allied health professionals' CPD and regional hospitals' KM (section 7.3). Finally, the study's limitations and recommendations for future research are presented (sections 7.4 & 7.5).

### **7.1 Critical Parameters Influencing CPD Programs**

The research design for this study utilised theoretical non-probability sampling to explore the factors associated with allied health professionals' CPD and hospitals' KM. The selection of case study hospitals and participants targeted crucial parameters influencing motivation and participation in CPD programs. Furthermore, previous research and knowledge gaps in the literature also guided the sampling selection criteria (refer to subsection 4.2.3 & Figure 12). Finally, the criteria targeted variables likely to affect CPD-related experiences and, consequently, the interview data for analysis. The following four subsections outline key variables hypothesised to influence CPD (7.1.1 - 7.1.4).

### **7.1.1 Regional location**

Regional hospitals have previously been found to face challenges in addressing the ongoing education of allied health professional employees (Department of Health, 2012). Regarding the case hospitals in this study, compliance with selection criteria specified that they were all classified as Victorian acute care public hospitals. The first key variable hypothesised to influence allied health professionals' CPD, and hospitals' KM concerned the classification of regionalism in Australia. All case hospitals were located geographically in regional Victoria. In addition, they were either inner or outer regional hospitals based on their distance from metropolitan Melbourne and the range of healthcare services they provided (described in subsection 4.2.3) (ABS, 2016). The dichotomy of inner and outer regional hospitals allowed the researcher to explore the effects of dissimilar access by allied health professionals to formal face-to-face CPD activities due to their varying distances from metropolitan Melbourne.

This study found evidence to support the previous research findings of Rappolt and Tassone (2002) and Stagnitti et al. (2005) and suggested that access to formal face-to-face CPD activities for allied health professionals is more difficult in regional locations. However, the perceived barrier to attending metropolitan based CPD was expressed similarly regardless of the distance from their regional workplace and Melbourne. This feeling of disadvantage expressed by the respondents was evident regardless of whether they worked in inner regional hospitals with a one-hour drive or outer regional hospitals with a three-and-a-half-hour drive. Therefore, it seems that just the label of being 'regional' conjures up the feeling of being disadvantaged among the participants. Although the feeling of disadvantage would appear valid for outer regional hospital employees, those working at inner regional hospitals may have similar drive times to people living on the outskirts of metropolitan Melbourne. However, despite neglecting some opportunities to participate in formal CPD activities in Melbourne, allied health professionals in this study believed it was essential to maintain and enhance their profession related knowledge and skills due to the greater independence required for regional practice. It is acknowledged that the data collection phase of this research was conducted prior to the COVID-19 pandemic, and subsequently, allied health professionals' engagement with online and virtual CPD activities may have since been transformed or redesigned.

### **7.1.2 Hospital size**

As discussed in the previous subsection, the case selection criteria in this study encompassed acute care public hospitals located in either inner or outer regional Victoria, Australia. The second key variable hypothesised to influence CPD and KM concerned hospital size. To analyse the findings related to the size of case hospitals, they were subdivided into small/medium versus large/referral hospitals according to the Australian Institute of Health and Welfare 2011-12 classifications (AIHW, 2013). The dichotomy of hospital size based on bed numbers allowed exploring this factor's effects on formal and informal learning opportunities and CoP availability (as described in subsections 2.4.7 & 2.4.8). In addition, the proposition tested was that larger hospitals potentially have an advantage in providing more resources and improved availability of formal and informal CPD activities for allied health professional staff. In contrast, smaller hospitals have fewer allied health professionals, which may affect access to locally available formal in-service CPD activities and informal workplace learning.

Findings of this study suggest that hospital size did not affect whether formal hospital provided CPD activities were made available to allied health professionals. In addition, there was also no evidence of hospital size impacting whether organisational affordances were made available to allied health professionals. Billett (2018) described affordances as learning opportunities an organisation provides to its employees, including informal learning opportunities such as challenging practice and working alongside expert colleagues. These affordances will be discussed in a later subsection (7.2.4).

### **7.1.3 Professions included in the study**

The previous subsection discussed this study's dichotomy of small/medium versus large/referral hospitals. The third key variable hypothesised to influence CPD, and KM relates to the purposeful selection of professions participating in this study. According to the previous research of Quinn et al. (1996), Richardson (1999), and Sim and Radloff (2009), the professionalisation endeavours of allied health professions correspond with their autonomy in practice and motivation to champion their CPD programs. Researchers had previously ascribed levels of autonomy to the three participating professions of radiography, sonography and physiotherapy; thus, being selected as a proxy for the postulated effects of autonomy on CPD. For example, radiographers were attributed with low autonomy (Sim & Radloff, 2009; Yelder, 2014; Yelder & Davis, 2009),

sonographers with moderate autonomy (McGregor et al., 2009), and physiotherapists with high levels of autonomy (Chipchase et al., 2006) (described in subsection 2.1.6).

Concerning the levels of autonomy ascribed to radiographers and physiotherapists in the literature, this study supports those findings. However, contrary to the view expressed in the literature about sonographers having moderate levels of autonomy, this study found no evidence to support the previous findings of McGregor et al. (2009). Instead, the general view conveyed by sonographers in this study indicates they believe they have increased autonomy and greater independence in their practice than their radiography colleagues. For example, they were allowed leeway in conducting clinical ultrasound examinations. However, these respondents also divulged that their everyday practice is required to meet radiologists' protocols and personal preferences. Furthermore, acceptance of radiologists' overarching legal responsibility was rationalised by sonographers, for example:

I've got to go on with what I am directed to do. Its part of being a mature professional, you don't get your own way all the time, even if you can back it with evidence. Quite often, there is conflicting evidence (E7 – Competent+ Sonographer).

Therefore, the sonographers had very little substantive autonomy in their day-to-day practice. Consequently, the MI professions of radiography and sonography in this study are substantially too similar in their autonomy to be considered independently. This finding is contrary to the literature and likely explained by the cohort of sonographers McGregor et al. (2009) investigated, who may have more expertise than the reporting radiologists. In contrast, the physiotherapists in this study described having high levels of autonomy in their day-to-day practice, allowing them to control clinical assessments and treatment options without direct supervision by the medical profession.

#### **7.1.4 Professional expertise**

The fourth and final key variable hypothesised to influence CPD, and KM is related to increasing levels of expertise and corresponding beneficial learning styles. Research findings suggest that learning requisites differ between recently graduated professionals who benefit most from rules-based explicit knowledge sources, whereas more experienced professionals benefit more from tacit knowledge sharing gained by working alongside their colleagues (Benner, 2004; Dall'Alba & Sandberg, 2006; Dreyfus & Dreyfus, 1980; Dreyfus et al., 1986) (refer to subsections 2.4.8 & 4.2.3). Therefore, the dichotomy of participant expertise tested the proposition that allied health professionals

may not be afforded appropriate learning experiences by their hospitals, given their level of expertise. For example, in small/medium-sized regional hospitals, there may be inadequate access to collegial work alongside expert practitioners to meet experienced professionals' learning needs. The variable of professional expertise is discussed further as part of the following summary of research findings.

## 7.2 Summary of the research findings

The research study described in this thesis answers the primary research question in the context of regional Victorian public hospitals. The findings of this study combined the literature reviewed by the researcher and the semi-structured interview analysis and suggest that the elements affecting allied health professionals' CPD were subjective. However, considered collectively, the common factors that significantly influenced allied health professionals' CPD included their holistic understanding of CPD, planning of CPD programs, use of reflective practice, professional expertise, and the competencies they thought necessary for good practice. In addition, hospitals' KM approaches and affordances also significantly impacted their CPD. The following subsections (7.2.1 - 7.2.5) expand on the answers to the subsidiary research questions (refer to Table 11).

**Table 11**

### *Thematic Analysis*

#### **Primary Research Question:**

1) What factors significantly influence the availability and effectiveness of continuing professional development (CPD) of allied health professionals (radiographers, sonographers and physiotherapists) in regional Victorian public hospitals?

<b>Subsidiary Research Questions</b>	<b>Common themes &amp; sub-themes</b>
<b>Scope of practice</b>	<ul style="list-style-type: none"> <li>• Small/medium-sized hospitals prefer generalist practitioners</li> <li>• Large/referral hospitals prefer multi-skilled practitioners</li> </ul>
<b>CPD – Holistic understanding</b> What understandings of CPD are held by managers and allied health professionals in regional Victorian public hospitals?	<ul style="list-style-type: none"> <li>• CPD viewed as career-long profession related learning</li> <li>• CPD viewed as all-inclusive, encompassing formal and informal activities, learning from practice and vicarious learning from work alongside expert practitioners*</li> <li>• Primary responsibility for CPD – allied health professionals</li> <li>• Secondary responsibility for CPD – hospitals and professional associations</li> <li>• CPD motivations               <ul style="list-style-type: none"> <li>○ patient care</li> <li>○ maintaining and enhancing profession related knowledge</li> <li>○ evidence-based practice</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ professional advancement – domain specialist status</li> <li>○ personal interest</li> <li>○ hospital needs</li> <li>● mandatory requirements for professional registration*</li> </ul>
<p><b>Planning of CPD Programs</b></p> <p>What factors influence the planning of CPD programs undertaken by allied health professionals in regional Victorian public hospitals?</p>	<ul style="list-style-type: none"> <li>● Face-to-face preferred</li> <li>● Hospital provided in-service training and CPD – available for physiotherapists only (including formal reflective practice)</li> <li>● Hospital support for CPD activities (training hours in EBA; registration fees; travel allowances; accommodation etc.)</li> <li>● Local availability – lack of relevant activities</li> <li>● Regional barriers – travel time</li> <li>● Online learning (Internet searches; webinars &amp; social media)</li> <li>● Formal and informal (mix) – ease of providing evidence</li> <li>● Interdisciplinary CPD*</li> </ul>
<p><b>Reflective practice</b></p>	<ul style="list-style-type: none"> <li>● Identifying gaps in knowledge – reactive reflection common</li> <li>● Little strategic planning of CPD programs</li> </ul>
<p><b>Knowledge Management (KM)</b></p> <p>How does the choice between either a personal, organisational or hybrid approach to KM in regional Victorian public hospitals impact the CPD undertaken by allied health professionals?</p>	<ul style="list-style-type: none"> <li>● Hybrid organisational and personal knowledge approaches</li> <li>● Organisational knowledge approach – protocol manuals in MI professions (required for hospital accreditation) <ul style="list-style-type: none"> <li>○ Personal knowledge focus for physiotherapists</li> <li>○ Knowledge sharing among the physiotherapists at in-service training and CPD meetings</li> </ul> </li> </ul>
<p><b>Professional expertise</b></p> <p>How does working in regional Victorian public hospitals affect allied health professionals' knowledge and expertise?</p>	<ul style="list-style-type: none"> <li>● Staff explicit knowledge – protocol manuals in MI professions</li> <li>● Basic tacit knowledge – mentoring of early career (novice to advanced beginners) allied health professionals</li> <li>● Complex tacit knowledge – little opportunity for competent+ allied health professionals to work with more expert colleagues</li> <li>● No apparent planning for informal on-the-job learning</li> <li>● Challenging practice and collaboration reduced in small/medium-sized hospitals</li> <li>● Professional isolation due to frequent work as a sole practitioner</li> <li>● Limited CoP opportunities</li> <li>● Personal knowledge networks*</li> <li>● Inter-professional cooperation*</li> </ul>
<p><b>Competencies for good practice</b></p> <p>Which competencies do hospital managers and allied health professionals consider necessary for good practice?</p>	<ul style="list-style-type: none"> <li>● patient care</li> <li>● knowledge for practice</li> <li>● interpersonal and communication skills</li> <li>● professionalism**</li> <li>● inter-professional collaboration</li> </ul>

Note: \* Less common theme from this study's respondents.

\*\*Considered necessary for good practice but unnecessary to include in CPD programs.

This section will conclude with a brief review of the Model of Allied Health Professionals' CPD, depicting the findings of this study as a heuristic framework, including the reflective feedback and deliberative planning processes (subsection 7.2.6).

### **7.2.1 CPD – holistic understanding**

Considered collectively, the respondents in this study understandably conceived of CPD in simple terms with two common themes: it was career-long and specifically focused on profession related learning. However, the definitions of CPD provided in the literature demonstrate a shift towards self-directed and reflective learning models. For example, a long-standing and succinct definition of CPD from the literature proposed by Madden and Mitchell (1993) specified that CPD involved a “plan formulated with regard to the needs of the professional, the employer, the profession and society” (p. 3). A further definition of CPD by Sargeant et al. (2011) that was relevant to healthcare professions and addressed hard competencies focused on knowledge for practice and soft competencies such as communication and professional collaboration. This more comprehensive definition allowed more nuances of CPD to be explored in this study. In addition, this notion of CPD incorporates learning from practice and workplace affordances, such as vicarious learning from everyday work alongside expert colleagues. Responding to findings in the literature review and interview analysis, a conceptual framework of CPD in allied health professions is proposed (described in Figure 5 in section 2.4).

The seminal research of Maslow (1943) and later research by Alderfer (1972) into theories of motivation described the need for ‘self-actualisation’ and ‘growth’, respectively. These theories and the research of others suggest that motivations to undertake CPD are complex, reflecting personal needs, values and interests (Boshier & Collins, 1985; Morris, 2019; Rigby & Ryan, 2018; Wlodkowski & Ginsberg, 2017). This study found evidence to support the literature in this regard, with respondents having discussed various motivations to participate in CPD without substantial differences identified between the participating professions. The respondents frequently cited motivations that included patient care, maintenance and enhancement of knowledge, evidence-based practice, professional advancement, satisfying personal interests, meeting hospital needs and mandatory requirements to maintain professional registration. Interestingly, satisfying mandatory requirements for professional registration was only a secondary motivation for most respondents.



The findings of this study agree with previous research that found professional advancement and domain specialisation were among allied health professionals' motivations to participate in CPD (Murphy & Calway, 2007; Pool et al., 2016; Stagnitti et al., 2005). In addition, this study found it was common for managers to support allied health professionals' career advancement and specialisation ambitions (refer to subsection 6.2.5). However, in offering their support, many managers understood that the hospital would also benefit. For example, managers in all but one of the large/referral hospitals noted that generalist practitioners who were competent in multiple traditional specialties were a better fit for working in regional hospitals. Consequently, managers in small/medium-sized regional hospitals sometimes actively frustrated allied health professionals' attempts to specialise within their discipline.

### **7.2.2 Planning of CPD Programs**

The literature suggests that effective CPD programs require strategic planning. In addition, the full benefits of CPD can only be realised if organisations and individuals collaborate, with more significant learning outcomes derived from individual strategic learning plans that are mindful of personal and organisational goals (Dowds & French, 2008; Eddy et al., 2015; Eraut, 2001; Henwood & Huggett, 1999; Madden & Mitchell, 1993; Poell & Van Der Krogt, 2016). In contrast to the aspirational view expressed in the literature, this study found little evidence of strategic planning among the respondents. For example, managers typically linked planning for CPD programs to hospital accreditation and annual performance reviews. Their rationale for performance reviews was to encourage a strategic approach to profession related learning and short-term planning for CPD programs; however, these were often the only formal planning undertaken. In addition, allied health professionals often viewed these reviews as a mandatory tick box exercise unrelated to genuine attempts to facilitate learning needs.

Hospital managers expected their employees to use reflective practice in planning their CPD programs and everyday work. Instead, allied health professionals frequently used informal ad hoc reflective practice, typically in response to adverse patient outcomes. Furthermore, most allied health professionals discussed not using reflective practice to guide medium and long-term strategic CPD planning or to aid the selection of their CPD activities. The reasons for the finding contrary to the aspirational strategic planning of CPD proposed in the literature were inferred by respondents who exhibited little understanding of the processes of reflective practice and its potential to inform strategic

planning. This lack of understanding may best be explained by the absence of such knowledge from respondents' undergraduate education. However, this apparent deficiency in education was less evident in physiotherapy, with only four physiotherapists at the two large/referral hospitals describing a long-term strategic approach based on needs analysis to guide their CPD programs. The previously discussed hypothesis, which correlated greater autonomy with increased motivation to participate in CPD programs more fully, would also be a reasonable explanation of these findings.

Although much of allied health professionals' CPD planning was short-term or ad hoc, the respondents discussed various influencing factors. The factors that influenced their planning included their preference for formal face-to-face CPD activities; the availability of hospital-provided in-service training and CPD; hospital support for their CPD activities; the availability of local CPD activities; online learning opportunities; the ease of providing evidence for mandatory CPD; and accounting for barriers to their regional location (described in sections 5.7 & 6.6).

### **7.2.3 Knowledge management**

The management systems and processes used to exploit knowledge are known as knowledge management (KM), and an enduring definition by Rowley (1999) acknowledges both explicit and tacit knowledge (refer to section 2.2). Furthermore, one of the main goals of KM in hospitals is to disperse new knowledge by encouraging knowledge-seeking and sharing behaviours (Mittal & Kumar, 2019; Rubtcova & Pavenkov, 2018). The literature review of KM in this study identified gaps in understanding of KM in small/medium-sized hospital contexts (described in section 2.2).

The respondents in this study described what Sanchez (2006) describes as hybrid forms of KMs. Hybrid versions of KM utilise complementary approaches, combining an organisational approach based on explicit documented profession related knowledge and a personal approach based on personally held tacit knowledge. However, this study found that the effectiveness of using protocol manuals for disseminating profession related knowledge was disputed. For example, the radiographers and sonographers had access to protocol manuals; however, they seldom influenced day-to-day practice. In contrast, the physiotherapists believed that protocol manuals were redundant in their profession, relying on their knowledge and professional experience to guide practice. The allied health professionals in this study described their reliance on interactions with colleagues

to enable knowledge sharing. However, whereas physiotherapists could regularly attend in-service CPD meetings, radiographers and sonographers had no formal staff meetings, relying on ad hoc interactions with colleagues.

Advocates of organisational KM approaches, including Nonaka and Takeuchi (1995) and Hadjimichael and Tsoukas (2019), follow the disputed notion that individually held tacit knowledge can be made explicit (refer to subsection 2.2.1). In this study, it was common for hospital managers to expect profession related knowledge to be available as up-to-date protocol and procedure manuals (described in subsection 5.6.1). The findings regarding the use of protocol manuals were conflicting, with respondents confirming that protocol manuals were available in MI departments, therefore being available to radiographers and sonographers. However, although protocol manuals were made available, they were seldom consulted to guide everyday practice. The reason that documented protocol manuals were available in MI departments is most likely a tick box exercise to satisfy hospital accreditation requirements.

Researchers also advocate personal approaches to KM based on tacit knowledge, considered outside of conscious awareness and challenging to articulate (Abidi et al., 2005; Hadjimichael & Tsoukas, 2019; Nonaka, 1994; Polanyi, 1961; Reber, 1989; Tsoukas, 1996). For hospitals, implementing personal knowledge approaches requires allied health professionals to have time for reflection and opportunities for social interactions through CoPs (Lave & Wenger, 1991; Nonaka, 1994; Wenger-Trayner & Wenger-Trayner, 2015; Wenger, 2010) (refer to subsection 2.4.7).

In contrast to radiographers and sonographers, physiotherapists described having few documented protocols, relying more on personally held knowledge for their practice. The physiotherapists justified this position because of the broad range of treatment options and, therefore, would rely on clinical reasoning to decide on appropriate treatments. In support of that position, managers believed physiotherapy practice needed to combine research evidence, professional experience and clinical reasoning. In the participating hospitals, the personal approach to KM in physiotherapy was aided by regular in-service CPD and reflective practice meetings. In contrast, MI managers and allied health professionals stated that there had been no recent in-service CPD or staff meetings.

Although respondents provided no evidence that managers had implemented any KM model, social and technological enabler models propose that improving interpersonal

relationships positively influences knowledge-sharing (Fu & Lee, 2005; Nonaka, 1994; Orzano et al., 2008; Reber, 1989) (discussed in subsection 2.2.3). In this study, many managers acknowledged that formal knowledge-sharing in their hospitals was deficient. In particular, the MI professions of radiography and sonography had no in-service CPD meetings in the participating hospitals during the data collection period. Therefore, staff in these professions relied on informal knowledge-sharing through unplanned staff interactions. In contrast, physiotherapists in all but one small/medium-sized hospital had regular in-service CPD sessions allowing them to share knowledge with their colleagues. Although it was hypothesised that one of the critical parameters influencing CPD was hospital size and the potential effects on KM, the findings in this study suggest that MI managers may not have considered what is required to facilitate knowledge-seeking and sharing behaviours among allied health professionals. Radiographers and sonographers discussed relying on ad hoc social interactions. The hybrid KM approaches adopted by the participating hospitals favour the use of personal tacitly held knowledge. When combined with the nature of profession related knowledge, this creates an interdependent relationship between CPD and KM. In addition, relying on personally held knowledge results in transferring responsibility for knowledge seeking and sharing processes to allied health professionals' CPD programs.

#### **7.2.4 Professional expertise**

The study described in this thesis also explored the relationship between professional expertise and learning modes. Early research into professional expertise progression was conducted by Dreyfus and Dreyfus (1980) and refined by Dreyfus et al. (1986). Their research revealed that people usually pass through at least five or six stages with qualitatively different characteristics in task performance, decision-making and learning modes, all changed with increased levels of experience (Benner, 2004; Dreyfus & Dreyfus, 1980, 2008; Dreyfus et al., 1986). For example, learning requisites differ between early career professionals who require learning from explicit knowledge versus more experienced professionals who benefit most from tacit knowledge through challenging practice and workplace interactions alongside expert colleagues (Benner, 2004; Dall'Alba & Sandberg, 2006; Dreyfus & Dreyfus, 1980; Dreyfus et al., 1986). Therefore, this subsection discusses the identified difference in learning style correlating with participants' increasing expertise (refer to subsection 2.4.8).

Government and professional associations now consider informal learning legitimate for meeting the CPD inputs needed for professional registration (ASAR, 2022; MRPBA, 2022; PBA, 2022). The eligible informal CPD activities include mentoring less experienced colleagues. However, Eraut (2011) and Billett (2014) found that purposefully structured everyday work is also central to improving professionals' expertise. A respondent eloquently described this viewpoint: "the majority of what you do, even on a day-to-day basis, a lot of it could be termed CPD" (A4 – Competent+ Radiographer). Collaboration with expert professionals facilitates vicarious experience, increases understanding of workplace experiences and allows learning from others' mistakes (Allen et al., 2019; Bandura, 1986a; DeTormes Eby et al., 2014).

Allied health professionals in this study had limited access to collegial work alongside more expert practitioners. However, early career allied health professionals were less affected, describing being mentored by competent practitioners. In contrast, more experienced practitioners in this study often could not collaborate with experts in their discipline. Therefore, this study suggests that hospital managers in regional Victorian hospitals neglect the contribution of everyday workplace learning for allied health professionals. This finding accords with previous research in other professions investigating the contribution of informal workplace learning (Eppich et al., 2016; Eraut, 1994, 2000, 2004, 2007, 2011).

Being unable to collaborate with expert practitioners, the respondents in this study were denied tacit knowledge transfer from other allied health professionals. Although the size and regional location of small/medium-sized hospitals might limit the opportunities for collaboration, the large/referral hospitals in this study also failed to provide these learning opportunities to their professional employees. Furthermore, the findings of this study suggest that hospital size did not affect whether formal hospital provided CPD activities were made available to allied health professionals. In addition, there was no evidence of hospital size impacting whether organisational affordances (Billett, 2018) were made available to allied health professionals.

#### **7.2.5 Competencies necessary for good practice**

The study described in this thesis also explored the gap in the literature regarding allied health profession related knowledge and skills critical to allied health practice. The interviews encouraged the allied health professionals to discuss the knowledge and skills

essential for high-quality clinical practice. Consequently, common responses included high-quality patient care, knowledge for practice, interpersonal and communication skills, professionalism, and interprofessional collaboration. Respondents considered ‘knowledge for practice’ an umbrella term for all profession related ‘hard’ competencies. However, they considered the inclusion of ‘soft’ competencies, which refer to higher-level generic skills and personal attributes, as equally essential (Johnston & McGregor, 2004; O’Byrne & Dell’Aquila, 2014; Stefanovski, 2020).

### **Patient care**

Unsurprisingly, this study supports previous research by Dowds and French (2008) and Micallef and Kayyali (2019) that found patient care to be an essential competency for inclusion in CPD programs. In this study, most respondents considered patient care as the motivation for joining their profession and a crucial component of CPD (refer to subsections 5.2.2 & 5.5.1). The findings of this study agree with Englander et al. (2013) in describing patient-centred compassionate care involving safe and effective treatment of patients, facilitated by constantly improving practice efficacy (refer to subsection 2.4.9).

### **Knowledge for practice**

The purpose of allied health professionals’ CPD activities is to contribute to developing their profession related knowledge and expertise. The findings in this study agree with Englander et al. (2013), including knowledge for practice as a competency necessary for high-quality allied health practice and the need to apply this knowledge to patient care (described in subsection 5.5.2). Most allied health professionals collectively grouped CPD competencies under the heading of ‘knowledge for practice’, and they frequently indicated a preference to include clinical knowledge and technical skills in their CPD programs.

### **Interpersonal and communication skills**

The CPD of allied health professionals addresses not only hard technical competencies such as knowledge for practice but also includes soft competencies or generic skills such as interpersonal communication and professionalism (Johnston & McGregor, 2004; O’Byrne & Dell’Aquila, 2014; Sargeant et al., 2011). The respondents in this study support the inclusion of higher-level generic or ‘soft’ skills in their CPD programs. The findings in this study support the literature generally, and Englander et al. (2013) in

particular by including interpersonal and communication skills as a necessary competency for allied health professional practice. In addition, as described previously (subsection 2.2.3), improving interpersonal and communication skills influences knowledge-sharing behaviours (Nonaka, 1994; Reber, 1989). The findings in this study suggest a need to customise communications for workplace discussions with patients or colleagues.

### **Professionalism**

Professionalism was another soft competency considered essential for good, allied health practice by the respondents in this study. In addition, they all believed that demonstrating acceptable social behaviours and behaving professionally were necessary for good practice (refer to subsection 5.5.4). However, the respondents in this study also suggested that entrenched attitudes and values might be difficult to change. The findings in this study agree with the literature, describing the need to demonstrate socially acceptable values and adhere to ethical principles (Englander et al., 2013; Houle, 1961, 1980) (described in subsection 2.4.9). However, the respondents in this study were sceptical about the inclusion of professionalism in CPD programs because they believed that professional enculturation throughout university training and early career professional practice made it redundant (refer to subsection 5.5.4). Therefore, although professionalism was considered an essential competency, it was not considered suitable for inclusion in CPD programs by the respondents in this study.

### **Inter-professional collaboration**

Interprofessional collaboration was another soft competency related to high-quality professional practice and considered worthy of inclusion in CPD programs. Informal learning can be drawn from collaboration with expert healthcare professionals from other professions. In addition, collaboration allows vicarious experience and understanding of other professionals' viewpoints (Allen et al., 2019; Bandura, 1986a; DeTormes Eby et al., 2014; Eraut, 2011; Sargeant et al., 2011). This study supports the literature and with Englander et al. (2013) regarding the inclusion of inter-professional collaboration among the knowledge and skills considered crucial for safe and effective patient-centred care (described in subsections 2.4.9 and 5.5.5). In addition, the respondents reported various inter-professional collaborations and believed that CPD might be beneficial.

Contrary to some of the views expressed in the literature, for example, Englander et al. (2013), this study found no evidence to support the proposed competency framework's eight competency domains in their entirety. Although this study affirms many of the common core competencies in the framework (refer to subsection 2.4.9), the competency domains practice-based learning and improvement, systems-based practice, and personal and professional development were not proffered by the respondents in this study. The general view conveyed by managers and allied health professionals indicates that their concept of CPD programs is somewhat simple and concise, possibly due to not having comprehensively considered this subject matter previously. This contrary finding can be explained because the Taxonomy of Competency Domains for Healthcare Professions proposed by Englander et al. (2013) is based on comprehensive research, building on previous competency models (described in subsection 2.4.9). Alternatively, it may be that if presented with the complete list of competencies, the respondents in this study may have elected to regard some competencies as irrelevant to their practice.

### **7.2.6 Model of allied health professionals' CPD**

The study described in this thesis applied a holistic approach to CPD, bringing together planning, CPD activities, professional competencies, profession related knowledge and expertise, and the role of reflective practice. The results are represented in the model of allied health professionals' CPD proffered by the researcher, depicted in Figure 15.

The following secondary research question is addressed by presenting the model:

3. How can the findings of this research be represented to improve the CPD of allied health professionals and knowledge management (KM) in regional Victorian public hospitals?

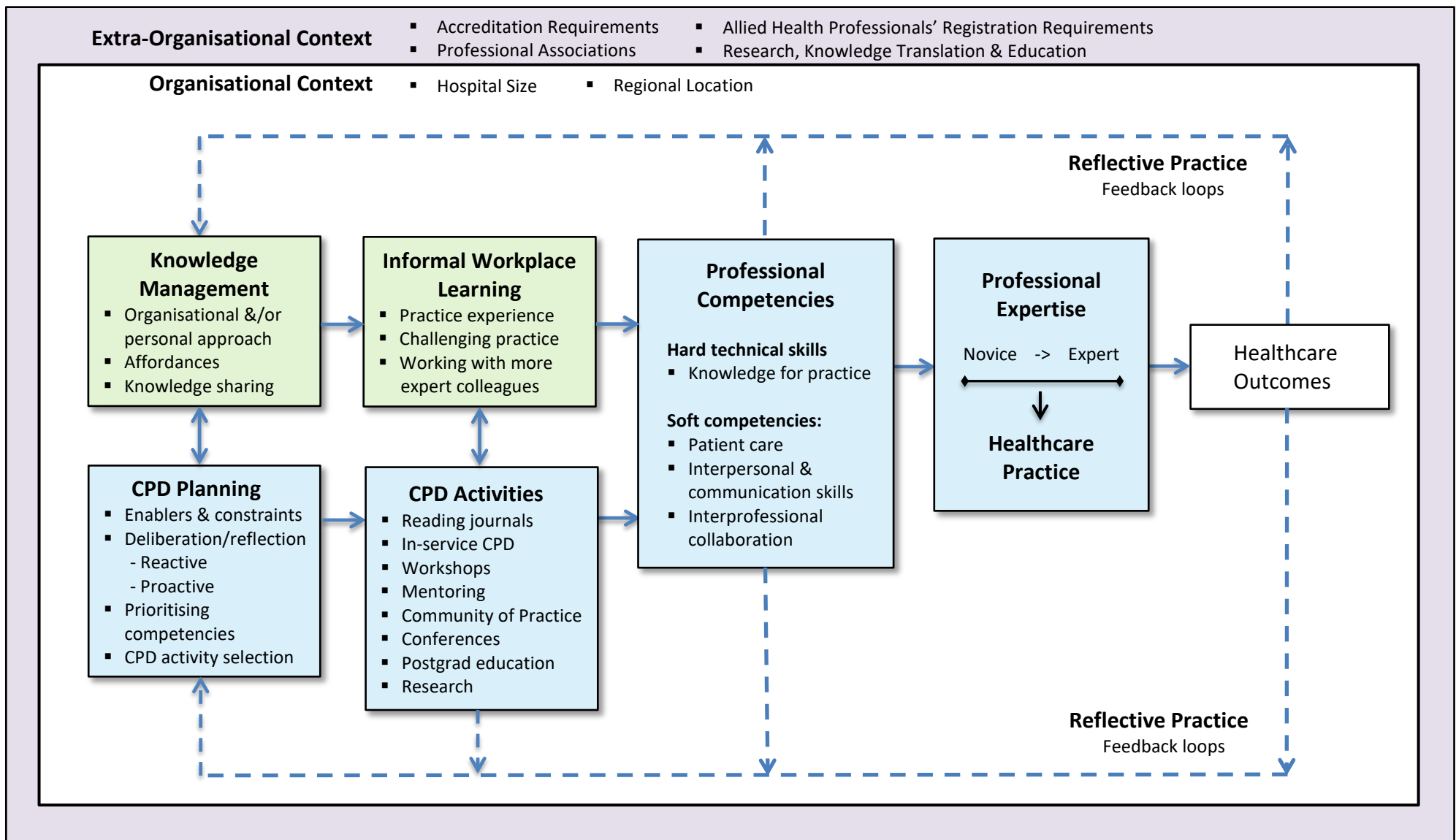
This normative model conceptualises this study's findings, abstracted in a heuristic framework with the interrelated components of CPD. In addition, the model depicts reflective feedback loops indicating deliberative planning of CPD, determined from respondents' experiences with CPD activities and knowledge from the literature.

#### **Extra-organisational context**

The model depicted in Figure 15 presents an extra-organisational context as the outermost set with a mauve background. For example, the Australian federal government funds Victorian public hospitals, which are the respondents' workplaces in this study.



**Figure 16** Model of Allied Health Professionals' CPD



In addition, federal and state governments influence public hospitals through hospital accreditation, allied health professionals' registration and the influence of the allied health professional associations (refer to section 3.1).

### **Organisational Context**

Organisational contexts influence allied health professionals working in Victorian public hospitals due to inner and outer regional locations and hospital size, as shown in the model with a white background. There are disparities in access to healthcare between regional and metropolitan populations (described in sections 3.2 - 3.4). In addition, most allied health professions have fewer members available to work in regional Australia. Therefore, allied health professionals working in regional Victoria face barriers, including high workloads and reduced access to metropolitan-based CPD (Berndt et al., 2017; Stagnitti et al., 2005).

### **Knowledge Management**

The organisational context of Victorian public hospitals included the effect of hospitals' KM, as depicted in the model with a green background (refer to section 2.2). In addition, hospital managers are also responsible for enabling tacit knowledge sharing (Mittal & Kumar, 2019; Sanchez, 2006). In this study, respondents discussed perspectives of KM as organisational, personal or hybrid approaches. Organisational KM approaches are based on explicit knowledge (described in subsection 2.2.1), and personal knowledge approaches are based on tacit knowledge, requiring time for reflection and enabling social interactions (refer to subsection 2.4.7) (Lave & Wenger, 1991; Nonaka, 1994; M. Smith et al., 2009; Wenger-Trayner & Wenger-Trayner, 2015; Wenger, 2010). Furthermore, the hospitals in this study have hybrid forms of KM (Sanchez, 2006), combining both organisational and personal knowledge approaches. Consequently, hospitals' KM also affects the profession related knowledge-sharing of the allied health professionals (described in subsection 2.2.3).

### **Informal Workplace Learning**

Informal workplace learning often contributes to allied health professionals' knowledge and expertise, as depicted in the model with a green background. Respondents in this study sometimes found it easier to provide evidence of formal CPD because of the certificate of attendance. In contrast, experienced allied health professionals described

informal CPD activities as meeting their learning needs. Contemporary learning perspectives encourage self-reflection, self-development, authentic learning opportunities, and social learning through workplace social interactions (Bandura, 1971, 1986b; Lave & Wenger, 1991; Wenger-Trayner & Wenger-Trayner, 2015; Wenger, 1998). In addition, Billett (2018) describes employer affordances contributing to workplace learning, including challenging practice and collaboration with experts.

### **CPD Planning**

Allied health professionals' CPD planning is depicted in the model with a blue background. Deliberative planning of CPD programs usually involves reflective practice to achieve a successful strategic approach to CPD (Dowds & French, 2008; Englander et al., 2013; Eraut, 2000; Plack & Greenberg, 2005). However, few respondents in this study had long-term strategies, instead relying on ad hoc learning as it arose. Therefore, the selections of CPD activities should satisfy allied health professionals' profession related learning needs after considering their current and future scope of practice.

### **CPD Activities**

Whether ad hoc or strategically planned, allied health professionals' CPD programs must include undertaking CPD activities, as depicted in the model with a blue background. Mandatory CPD requirements allow for eligible formal and informal activities (refer to subsection 2.4.6) (ASAR, 2022; MRPBA, 2022; PBA, 2022). This study's allied health professionals participated in a wide range of CPD activities (listed in section 5.4). The early career allied health professional respondents focused on developing their clinical knowledge and skills. Whereas competent, proficient and expert practitioners focussed on career advancement.

### **Professional Competencies**

Professional competencies can be used to assist with developing a CPD program and classify profession related knowledge, skill, and attributes, as depicted in the model with a blue background (described in subsection 2.4.9). The findings in this study distinguished between 'hard' technical practice competencies and 'soft' generic competencies (Johnston & McGregor, 2004; O'Byrne & Dell'Aquila, 2014; Stefanovski, 2020). Therefore, a framework of professional competencies is proposed to focus CPD programs on discrete profession related knowledge and practical skill sets. The findings

in this study included competencies believed to be necessary for high-quality practice and worthy of inclusion in CPD programs. They included patient care, knowledge for practice, interpersonal and communication skills, and interprofessional collaboration.

### **Professional Expertise and Healthcare Practice**

Allied health professionals' CPD programs contribute to developing professional competencies, as depicted in the model with a blue background. The effectiveness and efficiency of performing professional tasks in a range of practice domains. Profession related knowledge and skill acquisition stage-models are predicated on step-wise progression of knowledge and skills, advancing from 'novice' to 'expert' over time (refer to subsection 2.4.8) (Dreyfus et al., 1986). As discussed, contributions of explicit versus tacit knowledge to profession related learning make them compatible with knowledge and skill acquisition models. Whereas novices learn more from explicit and rules-based information, with increasing expertise, people progressively learn more from tacit knowledge from experts.

### **Healthcare Outcomes**

The study in this thesis explored the development of profession related knowledge and expertise. The healthcare outcomes aspect of the Model of Allied Health Professionals' CPD is predicated on the influence of knowledge and expertise on the efficacy of healthcare, as depicted in the model with a white background. Thus, it would also be expected to contribute to more positive patient health outcomes and should reduce Australia's medical diagnostic error rates (Graber, 2013) (described in section 3.2). Furthermore, many of the reflective practice examples provided by this study's respondents involved adverse outcomes. In those instances, reflective practice is necessary to improve practice and patients' healthcare outcomes, as depicted in the model with the broken lines and arrows.

## **7.3 Significance of the Findings**

The research study described in this thesis examined CPD in the allied health professions of radiography, sonography and physiotherapy in regional Victorian public hospitals. The study was predicated on the notion that improving allied health professionals' CPD programs, would positively affect the efficacy of healthcare diagnosis and treatments, thus contributing to improved healthcare and health outcomes. When this research project commenced, the study aligned with Australian federal government's research priorities

(Science Portfolio, 2015). At that time, the issues related to healthcare requiring the most research attention included the limited availability of CPD activities in regional Australia and its negative effect on evidence-based practice (Department of Health, 2012). In addition, this study explored the perceived underdevelopment of allied health professionals' CPD, and therefore this study is also aligned with the Victorian government's Health Priorities Framework (2012-2022) (DHHS, 2011). These government research priorities were founded on the perceived inadequacies of CPD and their contribution to Australia's medical diagnostic error rates (Graber, 2013). Therefore, should the findings of this research lead to improvements in allied health professionals' CPD and an uplift in evidence-based practice, which may contribute to more effective and efficient healthcare, particularly for the people that live in regional Australia (Department of Health, 2012).

The exploratory component of this study, including the literature review, aimed to improve understanding regarding the factors affecting allied health professionals' engagement with CPD programs. However, due to the overlapping literature domains required to be reviewed and to understand allied health professionals' CPD, the study contributes to the academic literature around the sociology of professions, adult education and KM. In addition, the findings of this study contribute directly to knowledge regarding allied health professionals' CPD. Furthermore, from an organisational perspective, this research explored KM of regional Victorian public hospitals to understand better the processes utilised to exploit profession related knowledge, including explicit and tacit knowledge assets in those contexts.

The extensive literature review undertaken as part of this study revealed gaps in research knowledge regarding the planning of CPD programs by allied health professionals and their learning needs in regional hospital settings. In addition, there was scant research into the contribution to profession related knowledge and skills by informal day-to-day work activities among allied health professionals. This study has also addressed previous recommendations from other researchers, including identifying the knowledge types required for allied health professional practice and whether day-to-day work activities support profession related learning (Billett, 2016). In addition, the influence of demographic factors that affect the feasibility of providing the affordances or opportunities to learn described by Billett (2001) has been explored. These affordances include the availability of challenging day-to-day work and collaboration with expert colleagues, which Eraut (2011) suggests might improve profession related knowledge and

skills. Finally, the use of interpretivist and qualitative methods in this study has also addressed the lack of studies in the literature that convey the perspective of allied health professionals.

The findings of this study have contributed to the development of a holistic Model of Allied Health Professionals' CPD. In addition, the knowledge derived from this study has practical benefits by identifying opportunities to improve allied health professionals' CPD planning and the implementation of CPD programs, thus providing the potential to improve the efficacy of allied health professionals' practice.

## **7.4 Contributions of this Research to Practice**

Several recommendations were derived from the research and may benefit the practice of allied health professionals' CPD and regional hospitals' KM in the participating regional Victorian public hospitals or other healthcare professionals and hospitals in similar contexts:

- Findings in this study suggest that it is no longer sufficient to undertake CPD activities ad hoc or with little planning. Instead, twenty-first-century allied health professionals need to be strategic regarding their CPD, acquiring competencies that will enable career advancement (Dowds & French, 2008; Eddy et al., 2015; Eraut, 2001; Poell & Van Der Krogt, 2016). Therefore, they should implement strategic planning, utilising reflective practice and well-considered formal and informal CPD activities. Furthermore, a comprehensive strategic approach to CPD should involve each level of social responsibility: the individual allied health professional, the hospital and professional associations (refer to subsections 2.4.10, 5.7.7 & 6.6.5).
- Previous research and the findings in this study found that allied health professionals prefer formal face-to-face CPD activities, but that access to them is frustrated in regional locations (Allen et al., 2019; Benwell & Fowler, 2017; Edward et al., 2019; Horn et al., 2019; Stagnitti et al., 2005). Therefore, new knowledge from allied health professionals' CPD and hospitals' KM should be shared with others. Prominent KM models suggest this be achieved through formal face-to-face education seminars and informal socialisation relying on tacit knowledge sharing through collegial work (Nonaka & Takeuchi, 1995; Sheng et al., 2013). Therefore, opportunities for face-to-face in-service CPD activities and group reflective practice should be available to all

allied health professionals employed in regional Victorian public hospitals (described in subsections 2.2.3, 2.4.6, 5.7.10 & 6.6.6).

- Online learning activities are now eligible as CPD activities required for allied health professionals' registration (ASAR, 2022; MRPBA, 2022; PBA, 2022). However, previous research has also found the uptake of online learning in regional areas to be underutilised (Mathur et al., 2005; Micallef & Kayyali, 2019; Sandars et al., 2007). The findings in this study included that respondent used online education, Webinars and Internet browsers to access profession related websites, read online journal articles, and participate in profession related social media. Therefore, opportunities for online learning, including Internet searches, distance education, webinars, and social media, should also be made available when face-to-face CPD and working alongside expert colleagues are not practicable (refer to subsections 2.4.6, 5.7.9 & 6.6.7).
- The affordances described by Billett (2018) as learning opportunities provided by employers include mentoring, and this study found it was available to all early career allied health professionals in the participating hospitals. Whereby they worked alongside more senior colleagues. Therefore, it is recommended that regional hospitals maintain mentoring arrangements for all early career allied health professionals, providing them with rules-based learning and access to protocol manuals if possible (described in subsections 2.4.6, 5.8.2 & 6.6.8).
- Billett (2018) describes the affordances as learning opportunities employers provide, including challenging practice and working alongside more expert practitioners. In addition, this type of deliberative work structure improves allied health professionals' expertise. However, well-structured day-to-day work lacks recognition for meeting mandatory CPD requirements (Benner, 2004; Dreyfus et al., 1986; Eraut, 2007, 2011). Therefore, everyday work routines should include more experienced allied health professionals being provided with challenging practice and the opportunity to work alongside experts (refer to subsections 2.4.8, 5.8.3 & 6.5.3).
- Reflective practice encourages allied health professionals to examine their professional practice, recognise knowledge gaps and plan their CPD programs (Bandura, 2001; Dubé & Ducharme, 2015; Plack & Greenberg, 2005). However, findings from this study and the literature suggest that planning CPD programs is challenging; however, reflective practice and deliberative planning are critical to

maximising profession related learning (Dowds & French, 2008; Englander et al., 2013). Therefore, teaching the skills required for effective reflective practice should be incorporated into hospital provided in-service CPD sessions. However, care must be taken not to undermine group reflective practice through hospital sub-cultures that discourage admitting mistakes (Börjesson et al., 2015) (described in subsections 2.4.4, 5.7.5 & 6.6.4).

- The fundamentally different KM approaches identified in the literature are either an organisational approach relying on explicit knowledge or a personal approach relying on tacit knowledge. However, all hospitals participating in this study were found to use hybrid forms of KM, combining organisational and personal approaches. (Brown & Duguid, 1991; Nonaka & Takeuchi, 1995; Reber, 1989; Szulanski, 1996; van Beveren, 2002; Yang, 2007). The literature suggests that successful KM requires managers to understand organisational needs and employees' knowledge-sharing behaviours before deciding which approach to implement (Sanchez, 2006). Therefore, a personal, organisational or hybrid KM approach should only be selected after considering the benefits and limitations of these approaches in collaboration with allied health professionals (refer to section 2.2 & subsections 2.2.3, 5.6.1, 5.6.3, 6.4.1 & 6.5.3).

## **7.5 Limitations of the Research and Methodology**

There are several limitations of this research study listed below; some instances where the scope of research might be more focused; others that would enable results to be generalised to a variety of organisational contexts or professional groups:

- This embedded case study's qualitative design relies on subjective interview data, which does not produce generalisable findings, instead providing examples of themes that practitioners and researchers may find applicable in similar contexts. In addition, the knowledge claims rely on paradigm-specific criteria of rigour (described in section 4.5).
- Due to the breadth and complexity of this PhD study, the thesis word limit of 100,000 words requires concise statements in the thematic analysis and discussion chapters.
- This study explores data from five regional Victorian public hospitals that employ members of all three allied health professions included in the research. Therefore, this study excluded allied health professionals working in private hospitals. In addition,



the PhD's time and resource constraints made a comparison with metropolitan public hospitals infeasible.

- The justification for the case selection criteria in this study has been explained in this thesis (refer to subsection 4.2.3); however, the disappointingly small number of volunteer participants in the MI professions of radiography and sonography at one large/referral hospital reduced the data available at that hospital.
- The respondents in this study were volunteers who consented to participate in the interviews; therefore, self-selection bias might result in individuals in the sample may not be representative of the complete cohort of allied health professionals. Therefore, it is plausible that those who were more willing to participate in this study are likely to be more active in the CPD programs explored. Consequently, this would most likely skew results, suggesting that the respondents might be more active in their profession related learning than those who did not volunteer to be interviewed.

## **7.6 Further Research**

The limitations of this study identified in the previous section provide potential avenues for further research, including:

- The research study design described in this thesis and the use of subjective interview data do not result in generalisable findings. However, quantitative research such as experimental or survey research would allow data collection and statistical analysis that would address the level of confidence to generalise from this study. In addition, a quantitative or mixed method approach would be appropriate to research each element in the Model of Allied Health Professionals' CPD (refer to section 6.7 & Figure 15).
- Further case studies regarding allied health professionals' CPD could be conducted with semi-structured interviews offered to all members of individual allied health professions at individual hospitals.
- The justification for the allied health professions in this study has been explained previously (refer to subsection 4.2.3); however, future studies could explore other allied health professions and the relationship between CPD, and hospitals' KM. Case study research is most beneficial when this study relates to people in similar contexts.
- Further research into allied health professionals' CPD and hospitals' KM in remote or metropolitan hospitals could add valuable insights to the research literature, as they

provide a valuable and contrasting dichotomy related to geographical context and its effect on CPD and KM.

- Building on the research described in this thesis, there is also scope for further research exploring a trend for universities to offer micro-credentialed healthcare related courses and the potential for it to be used to engage with allied health professionals and promote CPD activities.

This research explores CPD and KM in the distinctive settings of regional Victorian public hospitals, contexts that potentially suffer disadvantages due to hospital size, healthcare availability and geographical location. The participants have eloquently provided answers to this study's research questions. The insights provided into allied health professionals' CPD and Victorian public hospitals' KM have implications for improving allied health professionals' clinical knowledge. In addition, if the insights are applied to healthcare practice they may improve health outcomes for people living in regional locations.

The end.

## References

- Abidi, S. S. R., Cheah, Y. N., & Curran, J. (2005). A knowledge creation info-structure to acquire and crystallize the tacit knowledge of health-care experts. *IEEE Transactions on Information Technology in Biomedicine*, 9(2), 193-204.
- ABS. (2014). *Data by Region*. Australian Bureau of Statistics. Retrieved November 6, 2016 from <http://stat.abs.gov.au/itt/r.jsp?databyregion>
- ABS. (2016). *Australian Statistical Geography Standard (ASGS): Volume 5 - Remoteness Structure, July 2016* Australian Bureau of Statistics. Retrieved July 13, 2020 from <https://www.abs.gov.au/ausstats/abs@.nsf/mf/1270.0.55.005>
- ABS. (2020). *National, state and territory population*. Australian Bureau of Statistics. Retrieved June 28, 2021 from <https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/dec-2020>
- ABS. (2021). *Data by Region*. Australian Bureau of Statistics. Retrieved July 17, 2021 from <https://dbr.abs.gov.au/>
- ACSQHC. (2021). *National Safety and Quality Health Service Standards*. Australian Commission on Safety and Quality in Health Care. Retrieved June 16, 2022 from <https://www.safetyandquality.gov.au/publications-and-resources/resource-library/national-safety-and-quality-health-service-standards-second-edition>
- Addicott, R., McGivern, G., & Ferlie, E. (2006). Networks, organizational learning and knowledge management: NHS cancer networks. *Public Money and Management*, 26(2), 87-94.
- Agrawal, A., & Joshi, K. D. (2011). A review of community of practice in organizations: Key findings and emerging themes. 44th International Conference on System Sciences, Hawaii.
- AHPA. (2015). *Definition of Allied Health*. Allied Health Professionals Association. Retrieved March 17, 2016 from <http://www.ahpa.com.au/Home/DefinitionofAlliedHealth.aspx>
- AIHW. (2013). *Australian hospital statistics 2012–13. Appendix C: Public hospital peer groups*. Australian Institute of Health and Welfare. Retrieved October 19, 2016 from <https://www.aihw.gov.au/getmedia/52244d6a-1f44-4f52-a20f-16c90951cc81/16772-apc.pdf.aspx>
- AIHW. (2014). *Australia's Health 2014 No 13*. Australian Institute of Health and Welfare. Retrieved October 6, 2015 from <https://www.aihw.gov.au/reports-data>
- AIHW. (2019a). *Australia's hospitals at a glance 2018-19*. Australian Institute of Health and Welfare. Retrieved June 21, 2021 from <https://www.aihw.gov.au/getmedia/c14c8e7f-70a3-4b00-918c-1f56d0bd9414/aihw-hse-247.pdf.aspx?inline=true>
- AIHW. (2019b). *Rural & Remote Health*. Australian Institute of Health and Welfare. Retrieved June 21, 2021 from <https://www.aihw.gov.au/reports/rural-remote-australians/rural-and-remote-health>
- AIHW. (2020a). *Australia's Health Snapshots 2020*. Australian Institute of Health and Welfare. Retrieved June 19, 2021 from <https://www.aihw.gov.au/getmedia/128856d0-19a0-4841-b5ce-f708fed62c8c/aihw-aus-234-Australias-health-snapshots-2020.pdf.aspx>

- AIHW. (2020b). *Australia's Health: Data Insights*. Australian Institute of Health and Welfare, Australian Government. Retrieved June 19, 2021 from <https://www.aihw.gov.au/getmedia/be95235d-fd4d-4824-9ade-34b7491dd66f/aihw-aus-231.pdf.aspx?inline=true>
- AIR. (2014). *Pathway to Advanced Practice - Summary Document and Guidelines for Application for Accreditation*. Australian Institute of Radiography. Retrieved March 19, 2016 from <http://www.air.asn.au/advanced.php>
- Akhavan, P., Jafari, M., & Fathian, M. (2005). Exploring the failure factors of implementing knowledge management system in the organizations. *Journal of knowledge management practice*, 6, 1-10.
- Albán, W. E. M., Ruperti, M. J. B., Tumbaco, D. E. S., & Martínez, M. E. M. (2020). Brain and emotions on learning process. *International journal of health & medical sciences*, 3(1), 17-20.
- Alderfer, C. P. (1972). *Existence, relatedness, and growth: Human needs in organizational settings*. Free Press.
- Alibrahim, A., & Wu, S. W. (2020). Modelling competition in health care markets as a complex adaptive system: an agent-based framework. *Health Systems*, 9(3), 212-225.
- Allen, L. M., Palermo, C., Armstrong, E., & Hay, M. (2019). Categorising the broad impacts of continuing professional development: a scoping review. *Medical Education*, 53(11), 1087-1099.
- Arievitch, I. M. (2017). *Beyond the brain: An agentic activity perspective on mind, development and learning*. Sense Publishers.
- ASAR. (2022). *ASAR CPD Program: CPD Credits and Documentation*. Australian Sonographers Accreditation Registry. Retrieved April 9, 2022 from <https://www.asar.com.au/cpd/asar-cpd-program/>
- Ast, F. (1990). Hermeneutics (D. Van Vranken, Trans.). In G. L. Ormiston & A. D. Schrift (Eds.), *The Hermeneutic Tradition: From Ast to Ricoeur* (pp. 39-56). State University of New York Press (Original work published 1808).
- Attri, R. K. (2019). *The Models of Skill Acquisition and Expertise Development: A Quick Reference of Summaries*. Speed To Proficiency Research, S2Pro.
- Attwool, J. (2023). 'More towns without a doctor': Increase in GPs moving from rural areas. NewsGP. Retrieved 27 March 2023 from <https://www1.racgp.org.au/newsgp/professional/more-towns-without-a-doctor-increase-in-gps-moving>
- Audi, R. (2011). *Epistemology: A contemporary introduction to the theory of knowledge* (3rd ed.). Routledge.
- Australian Government. (2019). *Age Pension: Eligibility Age Requirements*. Department of Social Services. Retrieved February 24, 2022 from <https://www.dss.gov.au/seniors/benefits-payments/age-pension>
- Avby, G. (2016). Organizing for deliberate practice through workplace reflection. In S. Billett, D. Dymock, & S. Choy (Eds.), *Supporting Learning Across Working Life: Models, Processes and Practices* (pp. 75-90). Springer International Publishing.
- Ayala, R. A. (2020). Nursing as a Profession: Old Tensions, New Insights. In R. A. Ayala (Ed.), *Towards a Sociology of Nursing* (pp. 9-29). Palgrave Macmillan.

- Bagnall, R. G., & Hodge, S. (2017). Using an epistemological perspective to understand competence-based vocational and professional education. In M. Mulder (Ed.), *Competence-based Vocational and Professional Education* (pp. 125-144). Springer.
- Baird, M. (1992). Evolution of a degree program: the Australian example. *Radiologic Technology*, 63(6), 406-409.
- Baker, J. P. (2005). The history of sonographers. *Journal of Ultrasound in Medicine*, 24(1), 1-14.
- Baker, S., & Edwards, R. (2012). *How many qualitative interviews is enough? Expert voices and early career reflections on sampling and cases in qualitative research*. National Centre for Research Methods.
- Bandura, A. (1971). *Social learning theory*. General Learning Press.
- Bandura, A. (1986a). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology*, 4(3), 359-373.
- Bandura, A. (1986b). *Social foundations of thought and action: a social cognitive theory*. Prentice-Hall.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52(1), 1-26.
- Bandura, A. (2005). The evolution of social cognitive theory. In K. G. Smith & M. A. Hitt (Eds.), *Great minds in management* (pp. 9-35). Oxford University Press.
- Barbour, L., Armstrong, R., Condron, P., & Palermo, C. (2018). Communities of practice to improve public health outcomes: a systematic review. *Journal of knowledge management*, 22(2), 326-343.
- Benner, P. (2004). Using the Dreyfus model of skill acquisition to describe and interpret skill acquisition and clinical judgment in nursing practice and education. *Bulletin of science, technology & society*, 24(3), 188-199.
- Benwell, M., & Fowler, P. (2017). The reporting radiographer's role: a contemporary insight. *Journal of Social Science & Allied Health Professions*, 1(1), 6-11.
- Berndt, A., Murray, C. M., Kennedy, K., Stanley, M. J., & Gilbert-Hunt, S. (2017). Effectiveness of distance learning strategies for continuing professional development (CPD) for rural allied health practitioners: a systematic review. *BMC Medical Education*, 17(1), 1-13.
- Bierema, L. L. (2019). Adult Learning Theories and Practices. In M. Fedeli & L. L. Bierema (Eds.), *Connecting Adult Learning and Knowledge Management* (Vol. 8, pp. 3-25). Springer Nature.
- Billett, S. (2001). Learning through work: workplace affordances and individual engagement. *Journal of workplace learning*, 13(5), 209-214.
- Billett, S. (2014). Learning in the circumstances of practice. *International Journal of Lifelong Education*, 33(5), 674-693.
- Billett, S. (2015). Work, discretion and learning: processes of life learning and development at work. *International Journal of Training Research*, 13(3), 214-230.
- Billett, S. (2016). Learning through health care work: premises, contributions and practices. *Medical Education*, 50(1), 124-131.

- Billett, S. (2018). Distinguishing lifelong learning from lifelong education. *Journal of Adult Learning, Knowledge and Innovation*, 2(1), 1-7.
- Billett, S., Choy, S., Dymock, D., Smith, R., Henderson, A., Tyler, M., & Kelly, A. (2015). *Towards More Effective Continuing Education and Training for Australian Workers*. (1925173402). Adelaide, AU: National Centre for Vocational Education Research (NCVER)
- Billett, S., Choy, S., Dymock, D., Smith, R., Kelly, A., Tyler, M., Henderson, A., Lewis, J., & Beven, F. (2014). *Refining models and approaches in continuing education and training*. (1922056766). Adelaide, AU: NCVER
- Billett, S., & Hodge, S. (2016). Conceptualizing Learning Across Working Life, Provisions of Support and Purposes. In S. Billett, D. Dymock, & S. Choy (Eds.), *Supporting Learning Across Working Life* (Vol. 16, pp. 3-25). Springer International Publishing.
- Bitterman, M. (2006). Classical conditioning since Pavlov. *Review of General Psychology*, 10(4), 365-376.
- Bleicher, J. (2017). *Contemporary hermeneutics: Hermeneutics as method, philosophy and critique* (Vol. 2). Routledge.
- Bolisani, E., & Scarso, E. (2014). The place of communities of practice in knowledge management studies: a critical review. *Journal of knowledge management*, 18(2), 366-381.
- Bollington, A. (2015). *Business brief: Why isn't everyone lifelong learning?* OECD Forum 2015. Retrieved February 24, 2020 from <https://www.oecd.org/education/lifelong-learning.htm>
- Bonaccorsi, A. (2022). An epistemic approach to research assessment in the social sciences. In T. Engels & E. Kulczycki (Eds.), *Handbook on Research Assessment in the Social Sciences* (pp. 14-47). Edward Elgar Publishing.
- Bordoloi, P., & Islam, N. (2012). Knowledge management practices and healthcare delivery: a contingency framework. *The Electronic Journal of Knowledge Management*, 10(2), 110-120.
- Börjesson, U., Cedersund, E., & Bengtsson, S. (2015). Reflection in action: Implications for care work. *Reflective Practice*, 16(2), 285-295.
- Boshier, R., & Collins, J. B. (1985). The Houle typology after twenty-two years: A large-scale empirical test. *Adult Education Quarterly*, 35(3), 113-130.
- Bourdieu, P. (2008). The Forms of Capital. In N. W. Biggart (Ed.), *Readings in economic sociology* (Vol. 4, pp. 280-291). Blackwell Publishing.
- Brante, T. (1988). Sociological Approaches to the Professions. *Acta sociologica*, 31(2), 119-142.
- Brown, J. S., & Duguid, P. (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization science*, 2(1), 40-57.
- Burns, E. A. (2019a). *Theorising Professions: A Sociological Introduction*. Springer Nature.
- Burns, E. A. (2019b). Unbundling Professional Expertise. In E. A. Burns (Ed.), *Theorising Professions* (pp. 259-291). Springer Nature.

- Burt, R. S., Kilduff, M., & Tasselli, S. (2013). Social network analysis: Foundations and frontiers on advantage. *Annual Review of Psychology*, *64*, 527-547.
- Butler, S. M. (2011). Medicine on Trial: Regulating the Health Professions in Later Medieval England. *Florilegium*, *28*, 71-94.
- Cambridge University. (2022). *English Dictionary*. Cambridge University Press  
Retrieved May 24, 2022 from <https://dictionary.cambridge.org/dictionary/english/>
- Campbell, C., Silver, I., Sherbino, J., Cate, O. T., & Holmboe, E. S. (2010). Competency-based continuing professional development. *Medical Teacher*, *32*(8), 657-662.
- Caruso, S. J. (2018). Toward understanding the role of Web 2.0 technology in self-directed learning and job performance. *Contemporary Issues in Education Research (CIER)*, *11*(3), 89-98.
- Castillo, L. A. M., & Cazarini, E. W. (2014). Integrated model for implementation and development of knowledge management. *Knowledge Management Research & Practice*, *12*(2), 145-160.
- Cerchione, R., Centobelli, P., Oropallo, E., Magni, D., & Borin, E. (2023). Knowing what you don't know: a tertiary study on knowledge management. *Journal of knowledge management, Ahead of print*. Retrieved 19 March 2023, from <https://www.emerald.com/insight/content/doi/10.1108/JKM-07-2022-0589/full/html>
- Chatti, M. A. (2012). Knowledge management: a personal knowledge network perspective. *Journal of knowledge management*, *16*(5), 829-844.
- Chau, J., Chadbourn, P., Hamel, R., Mok, S., Robles, B., Chan, L., Cott, C., & Yeung, E. (2012). Continuing education for advanced manual and manipulative physiotherapists in Canada: a survey of perceived needs. *Physiotherapy Canada*, *64*(1), 20-30.
- Chipchase, L. S., Galley, P., Jull, G., McMeeken, J. M., Refshauge, K., Nayler, M., & Wright, A. (2006). Looking back at 100 years of physiotherapy education in Australia. *Australian Journal of Physiotherapy*, *52*(1), 3-7.
- Choi, S. Y., Kang, Y. S., & Lee, H. (2008). The effects of socio-technical enablers on knowledge sharing: an exploratory examination. *Journal of information science*, *34*(5), 742-754.
- Choy, S., Billett, S., & Dymock, D. (2016). Continuing education and training: Needs, models and approaches. In S. Billett, D. Dymock, & S. Choy (Eds.), *Supporting Learning Across Working Life* (pp. 213-229). Springer International Publishing.
- Community Affairs Legislation Committee. (2023). *Senate Proof Committee Hansard*. Commonwealth of Australia. Retrieved 16 February 2023 from [https://parlinfo.aph.gov.au/parlInfo/download/committees/estimate/26531/toc\\_pdf/Community%20Affairs%20Legislation%20Committee\\_2023\\_02\\_16.pdf;fileType=application%2Fpdf#search=%22Matthew%20Williams%20committees%22](https://parlinfo.aph.gov.au/parlInfo/download/committees/estimate/26531/toc_pdf/Community%20Affairs%20Legislation%20Committee_2023_02_16.pdf;fileType=application%2Fpdf#search=%22Matthew%20Williams%20committees%22)
- Corden, A., & Sainsbury, R. (2006). *Using verbatim quotations in reporting qualitative social research: researchers' views*. Social Policy Research Unit, University of York.
- Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches*. Sage Publications.
- Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage Publications.

- Cross, R., Laseter, T., Parker, A., & Velasquez, G. (2006). Using social network analysis to improve communities of practice. *California Management Review*, 49(1), 32-60.
- Cu, A., Meister, S., Lefebvre, B., & Ridde, V. (2021). Assessing healthcare access using the Levesque's conceptual framework—a scoping review. *International journal for equity in health*, 20(1), 1-14.
- Curran, V., Gustafson, D. L., Simmons, K., Lannon, H., Wang, C., Garmsiri, M., Fleet, L., & Wetsch, L. (2019). Adult learners' perceptions of self-directed learning and digital technology usage in continuing professional education: An update for the digital age. *Journal of Adult and Continuing Education*, 25(1), 74-93.
- Daire, J., Yates, C., & Robinson, S. (2020). International health care systems. In E. Willis, L. Reynolds, & T. Rudge (Eds.), *Understanding the Australian Health Care System* (4th ed., pp. 53-70). Elsevier Australia.
- Dall'Alba, G., & Sandberg, J. (2006). Unveiling professional development: A critical review of stage models. *Review of educational research*, 76(3), 383-412.
- Davenport, T. H., & Prusak, L. (2000). *Working knowledge: How organizations manage what they know*. Harvard Business School Press.
- Davis, W. M., Ho, K., & Last, J. (2015). Advancing social media in medical education. *CMAJ: Canadian Medical Association Journal*, 187(8), 549-550.
- Decker, S., & Iphofen, R. (2005). Developing the profession of radiography: making use of oral history. *Radiography*, 11(4), 262-271.
- DeKeyser, R. (2007). Skill acquisition theory. In B. VanPatten & J. Williams (Eds.), *Theories in second language acquisition: An introduction* (2nd ed., pp. 97-113). Routledge.
- Department of Health. (2012). *National Strategic Framework for Rural and Remote Health*. Department of Health, Standing Council on Health, Commonwealth of Australia. Retrieved October 13, 2015 from [http://www.ruralhealthaustralia.gov.au/internet/rha/publishing.nsf/Content/EBD8D28B517296A3CA2579FF000350C6/\\$File/NationalStrategicFramework.pdf](http://www.ruralhealthaustralia.gov.au/internet/rha/publishing.nsf/Content/EBD8D28B517296A3CA2579FF000350C6/$File/NationalStrategicFramework.pdf)
- Department of Health. (2019). *Stronger Rural Health Strategy - factsheets*. Department of Health, Australian Government. Retrieved June 28, 2022 from <https://www1.health.gov.au/internet/main/publishing.nsf/Content/stronger-rural-health-strategy-factsheets>
- Department of Health. (2021). *Fact Sheet Allied Health 2019*. Retrieved March 9, 2023 from <https://hwd.health.gov.au/resources/publications/factsheet-alld-2019.html>
- DeRobertis, E. M. (2017). *The phenomenology of learning and becoming: Enthusiasm, creativity, and self-development*. Springer.
- DeTormes Eby, L. T., Brown, B. L., & George, K. (2014). Mentoring as a strategy for facilitating learning: Protégé and mentor perspectives. In S. Billett, C. Harteis, & H. Gruber (Eds.), *International handbook of research in professional and practice-based learning* (pp. 1071-1097). Springer.
- DHHS. (2011). *The Victorian Health Priorities Framework 2012–2022. Rural and Regional Health Plan*. Department of Health and Human Services, State Government Victoria. Retrieved October 7, 2015 from <https://www2.health.vic.gov.au/about/publications/policiesandguidelines/vic-health-priorities-framework-2012-22-rural-plan>



- DHHS. (2016). *Allied health: credentialling, competency and capability framework (revised edition) Driving effective workforce practice in a changing health environment*. Department of Health and Human Services, Victorian Government. Retrieved April 2, 2020 from <https://www.health.vic.gov.au/allied-health-workforce/credentialling-competency-and-capability-framework>
- DHHS. (2019). *Accreditation policy for Victorian publicly funded health services: National Safety and Quality Health Service Standards* Department of Health and Human Services, Victorian Government. Retrieved June 13, 2022 from <https://www.health.vic.gov.au/quality-safety-service/victorian-policy-on-hospital-accreditation>
- DHHS. (2021). *Hospitals & health services*. Department of Health & Human Services, Victorian Government. Retrieved April 19, 2022 from <https://www.health.vic.gov.au/hospitals-and-health-services>
- Dilthey, W. (1990). The rise of hermeneutics (F. Jameson, Trans.). In G. L. Ormiston & A. D. Schrift (Eds.), *The Hermeneutic Tradition: From Ast to Ricoeur* (pp. 101-114). State University of New York Press (Original work published 1964).
- Dixon-Woods, M., Yeung, K., & Bosk, C. L. (2011). Why is UK medicine no longer a self-regulating profession? The role of scandals involving “bad apple” doctors. *Social Science and Medicine*, 73(10), 1452-1459.
- Dowds, J., & French, H. (2008). Undertaking CPD in the workplace in physiotherapy. *Physiotherapy Ireland* (29), 11-19.
- Dreyfus, H. L., & Dreyfus, S. E. (1980). A Five-Stage Model of the Mental Activities Involved in Directed Skill Acquisition. In Berkeley, CA Operations Research Center, University of California.
- Dreyfus, H. L., & Dreyfus, S. E. (2008). Beyond expertise: Some preliminary thoughts on mastery. In K. Nielsen (Ed.), *A Qualitative Stance: Essays in honor of Steiner Kvale* (pp. 113-124). Aarhus University Press
- Dreyfus, H. L., Dreyfus, S. E., & Athanasiou, T. (1986). *Mind over machine: The Power of Human Intuition and Expertise in the Era of the Computer*. The Free Press, Macmillan.
- Dubé, V., & Ducharme, F. (2015). Nursing reflective practice: An empirical literature. *Journal of Nursing Education and Practice*, 5(7), 91-99.
- Duckett, S., & Willcox, S. (2015). *The Australian health care system*. Oxford University Press.
- Duguid, P. (2005). “The art of knowing”: Social and tacit dimensions of knowledge and the limits of the community of practice. *The information society*, 21(2), 109-118.
- Eaton, C. (2016). “I don’t get it”,—the challenge of teaching reflective practice to health and care practitioners. *Reflective Practice*, 17(2), 159-166.
- Eddy, A., Eddy, D., & Doughty, J. (2015). Evidencing continual professional development: maximising impact and informing career planning. *Journal of medical imaging and radiation sciences*, 46(4), 361-364.
- Edward, K.-L., Walpole, L., Lambert, G., Phillips, S., Gow, J., Morrow, J., Huynh, M., & Hiller, J. (2019). The influence of hospital location and ‘level of care’ on continuing professional development. *Nurse Education in Practice*, 41, 1-6.
- Egetenmeyer, R., Breitschwerdt, L., & Lechner, R. (2019). From ‘traditional professions’ to ‘new professionalism’: A multi-level perspective for analysing

- professionalisation in adult and continuing education. *Journal of Adult and Continuing Education*, 25(1), 7-24.
- Elliott, P. (1972). *The Sociology of the Professions*. Macmillan Education.
- Engelseth, P., White, B., Mundal, I., Eines, T. F., & Kritchanchai, D. (2021). Systems modelling to support the complex nature of healthcare services. *Health and Technology*, 11(1), 193-209.
- Englander, R., Cameron, T., Ballard, A. J., Dodge, J., Bull, J., & Aschenbrener, C. A. (2013). Toward a common taxonomy of competency domains for the health professions and competencies for physicians. *Academic Medicine*, 88(8), 1088-1094.
- Eppich, W., Rethans, J.-J., Teunissen, P. W., & Dornan, T. (2016). Learning to work together through talk: Continuing professional development in medicine. In S. Billett, D. Dymock, & S. Choy (Eds.), *Supporting learning across working life* (pp. 47-73). Springer International Publishing.
- Eraut, M. (1994). *Developing professional knowledge and competence*. The Falmer Press.
- Eraut, M. (2000). Non-formal learning and tacit knowledge in professional work. *British Journal of Educational Psychology*, 70(1), 113-136.
- Eraut, M. (2001). Do continuing professional development models promote one-dimensional learning? *Medical Education*, 35(1), 8-11.
- Eraut, M. (2004). Informal learning in the workplace. *Studies in continuing education*, 26(2), 247-273.
- Eraut, M. (2007). Learning from other people in the workplace. *Oxford review of education*, 33(4), 403-422.
- Eraut, M. (2011). Informal learning in the workplace: evidence on the real value of work-based learning (WBL). *Development and Learning in Organizations: An International Journal*, 25(5), 8-12.
- Evetts, J. (2013). Professionalism: Value and ideology. *Current sociology*, 61(5-6), 778-796.
- Farin, I. (2016). The Different Notions of History in Heidegger's Work. In M. Bowler & I. Farin (Eds.), *Hermeneutical Heidegger* (pp. 23-60). Northwestern University Press.
- Finlay, L. (2013). Unfolding the phenomenological research process: Iterative stages of "seeing afresh". *Journal of Humanistic Psychology*, 53 (2), 172 -201
- Flood, A. (2010). Understanding phenomenology: Anne Flood looks at the theory and methods involved in phenomenological research. *Nurse Researcher*, 17(2), 7-15.
- Freidson, E. (1988). *Profession of medicine: A study of the sociology of applied knowledge* (2nd ed.). University of Chicago Press.
- Freidson, E. (2001). *Professionalism: The third logic*. University of Chicago Press.
- Friedman, A., & Phillips, M. (2004). Continuing professional development: Developing a vision. *Journal of education and work*, 17(3), 361-376.
- Friedman, A., & Woodhead, S. (2008). *Approaches to CPD measurement*. International Accounting Education Standards Board, Professional Associations Research Network.

- Fu, S. S., & Lee, M. K. (2005). IT Based Knowledge Sharing and Organizational Trust: The Development and Initial Test of a Comprehensive Model. ECIS 2005 Proceedings,
- Furber, C. (2010). Framework analysis: a method for analysing qualitative data. *African Journal of Midwifery and Women's health*, 4(2), 97-100.
- Gale, N. K., Heath, G., Cameron, E., Rashid, S., & Redwood, S. (2013). Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Medical Research Methodology*, 13(1), 1-8.
- Gibbs, G. (1988). *Learning by doing: A guide to teaching and learning methods*. Further Education Unit, Oxford Polytechnic.
- Giddens, A. (1983). Comments on the theory of structuration. *Journal for the Theory of Social Behaviour*, 13(1), 75-80.
- Gill, P., Stewart, K., Treasure, E., & Chadwick, B. (2008). Methods of data collection in qualitative research: interviews and focus groups. *British Dental Journal*, 204(6), 291-295.
- Goller, M., & Billett, S. (2014). Agentic behaviour at work: Crafting learning experiences. In C. Harteis, A. Rausch, & J. Seifried (Eds.), *Discourses on professional learning: On the Boundary Between Learning and Working* (pp. 25-44). Springer.
- Gottschalk, P. (2006). *Knowledge Management Systems: Value Shop Creation: Value Shop Creation*. IDEA Group Publishing.
- Graber, M. L. (2013). The incidence of diagnostic error in medicine. *BMJ quality & safety*, 22(Suppl 2), 21-27.
- Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: time for a map? *Journal of Continuing Education in the Health Professions*, 26(1), 13-24.
- Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360-1380.
- Granovetter, M. (2003). The strength of weak ties. In R. Cross, A. Parker, & L. Sasson (Eds.), *Networks in the knowledge economy* (pp. 109-129). Oxford University Press.
- Griscti, O., & Jacono, J. (2006). Effectiveness of continuing education programmes in nursing: literature review. *Journal of Advanced nursing*, 55(4), 449-456.
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research*, 2(163-194), 105.
- Habermas, J. (1990). The hermeneutic claim to universality (J. Bleicher, Trans.). In G. L. Ormiston & A. D. Schrift (Eds.), *The Hermeneutic Tradition: From Ast to Ricoeur* (pp. 245-272). State University of New York Press (Original work published 1971).
- Hackett, A., & Strickland, K. (2018). Using the framework approach to analyse qualitative data: a worked example. *Nurse Researcher*, 26(3), 1-6.
- Hadjimichael, D., & Tsoukas, H. (2019). Toward a better understanding of tacit knowledge in organizations: Taking stock and moving forward. *Academy of Management Annals*, 13(2), 672-703.

- Hager, P. (2017). The integrated view on competence. In M. Mulder (Ed.), *Competence-based vocational and professional education: Bridging the Worlds of Work and Education* (Vol. 23, pp. 203-228). Springer International Publishing
- Hassall, L. (2007). Sonography—the emergence of a profession. *ASUM Ultrasound Bulletin*, 10(3), 29-34.
- Hassan, M. M., Alam, M. N., Campbell, N., Bowyer, D., & Reaz, M. (2022). Human Resource Management in Health Care Industries for Generation Y: Challenges of 21st Century. *Australasian Accounting, Business and Finance Journal*, 16(1), 2.
- Heidegger, M. (1962). *Being and time* (J. Macquarrie & E. Robinson, Trans.). Harper & Row Publishers. (Original work published 1927).
- Henwood, M., Shaw, A., Cavanagh, J., Bartram, T., Marjoribanks, T., & Kendrick, M. (2017). Men's health and communities of practice in Australia. *Journal of health organization and management*, 31(2), 207-222.
- Henwood, S. M., & Huggett, S. M. (1999). Radiographic CPD requirements—a regional study. *Radiography*, 5(1), 3-10.
- Herron, P. D. (2015). Opportunities and ethical challenges for the practice of medicine in the digital era. *Current Reviews in Musculoskeletal Medicine*, 8(2), 113-117.
- Hoepfl, M. C. (1997). Choosing qualitative research: a primer for technology education researchers. *Journal of Technology Education*, 9(1).
- Holsapple, C. W., & Joshi, K. D. (2002). Knowledge management: A threefold framework. *The information society*, 18(1), 47-64.
- Holstein, J. A., & Gubrium, J. F. (1997). The active interview. In Silverman (Ed.), *Qualitative research: Theory, method and practice* (2nd ed., pp. 140-161). Sage Publications.
- Holstein, J. A., & Gubrium, J. F. (2016). Narrative practice and the active interview. In D. Silverman (Ed.), *Qualitative Research* (Vol. 67, pp. 51-66). Sage Publications.
- Horn, J., DeMers, S. T., Lightfoot, S., & Webb, C. (2019). Using continuing professional development to improve maintenance of professional competence: A call for change in licensure renewal requirements. *Professional Psychology: Research and Practice*, 50(2), 120.
- Houle, C. O. (1961). *The inquiring mind: A study for the adult who continues to learn*. University of Wisconsin Press.
- Houle, C. O. (1980). *Continuing education in the professions*. Jossey-Bass.
- Hoyt, W. T., & Bhati, K. S. (2007). Principles and practices: An empirical examination of qualitative research in the Journal of Counseling Psychology. *Journal of Counseling Psychology*, 54(2), 201.
- Hughes, H. E., Mallan, K. M., & Foth, M. (2019). Social living labs for informed learning: A conceptual framework of interprofessional education in community healthcare. *Journal of Information Literacy*, 13(2), 112-135.
- Hujala, T., & Laihonen, H. (2021). Effects of knowledge management on the management of health and social care: a systematic literature review. *Journal of knowledge management*, 25(11), 203-221.
- Husserl, E. (1981). Pure phenomenology, its method and its field of investigation (R. W. Jordan, Trans.). In P. McCormick & F. Elliston (Eds.), *Husserl: Shorter Works*.

- Inaugural lecture at Freinburg in Breisgau*. University of Notre Dame Press (Original work published 1917).
- Izzo, J. B., & Withers, P. (2002). Winning employee retention strategies for today's healthcare organizations. *Healthcare Financial Management*, 56(6), 52-58.
- Jarvis, P. (2004). Human learning as existential: Behaviourism revisited. Current Issues in Adult Learning and Motivation, 7th Adult Education Colloquium, Birografika BORI; Ljubljana
- Jasper, M. (2003). *Beginning reflective practice*. Nelson Thornes.
- Jasper, M. (2013). *Beginning reflective practice* (2nd ed.). Cengage Learning.
- Johnston, S., & McGregor, H. (2004). Recognising and supporting a scholarship of practice: Soft skills are hard! Creating Flexible Learning Environments: Proceedings of the 15th Australasian Conference for the Australasian Association for Engineering Education and the 10th Australasian Women in Engineering Forum, Toowoomba, AU.
- Karas, M., Sheen, N. J., North, R. V., Ryan, B., & Bullock, A. (2020). Continuing professional development requirements for UK health professionals: a scoping review. *BMJ open*, 10(3), 1-11.
- Kardos, R. L., Cook, J., Butson, R. J., & Kardos, T. B. (2009). The development of an ePortfolio for life-long reflective learning and auditable professional certification. *European Journal of Dental Education*, 13(3), 135-141.
- King, O., Nancarrow, S. A., Borthwick, A. M., & Grace, S. (2015). Contested professional role boundaries in health care: a systematic review of the literature. *Journal of foot and ankle research*, 8(1), 1.
- King, W. R. (2009). Knowledge management and organizational learning. In *Annals of Information Systems* (Vol. 4, pp. 3-13). Springer.
- Kirkpatrick, D., & Kirkpatrick, J. (2006). *Evaluating training programs: The four levels* (3rd ed.). Berrett-Koehler Publishers.
- Kirwan, J. R., Lounsbury, J. W., & Gibson, L. W. (2014). An examination of learner self-direction in relation to the big five and narrow personality traits. *Sage Open*, 4(2), 1-14.
- Kläser, N. (2018). *Self-directed learning at the workplace among healthcare professionals* [Masters, University of Twente]. Enschede, NL.
- Klein, J. H., Connell, N., & Meyer, E. (2005). Knowledge characteristics of communities of practice. *Knowledge Management Research & Practice*, 3(2), 106-114.
- Knowles, M. S. (1968). Andragogy, not pedagogy. *Adult leadership*, 16(10), 350-352.
- Knowles, M. S. (1975). *Self-directed learning: A guide for learners and teachers*. Follett.
- Knowles, M. S. (1980). *The modern practice of adult learning; From pedagogy to androgogy*. Cambridge Books.
- Koshy, K., Limb, C., Gundogan, B., Whitehurst, K., & Jafree, D. J. (2017). Reflective practice in health care and how to reflect effectively. *International journal of surgery. Oncology*, 2(6), 1-3.
- Kothari, A., Hovanec, N., Hastie, R., & Sibbald, S. (2011). Lessons from the business sector for successful knowledge management in health care: a systematic review. *BMC Health Services Research*, 11(1), 173.

- Larkin, G. V. (1978). Medical dominance and control: radiographers in the division of labour. *The Sociological Review*, 26(4), 843-858.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.
- Lawson, C., & Cowling, C. (2015). Social media: The next frontier for professional development in radiography. *Radiography*, 21(2), e74-e80.
- Lee, J. H., & Kim, Y. G. (2001). A stage model of organizational knowledge management: a latent content analysis. *Expert systems with applications*, 20(4), 299-311.
- Levesque, J.-F., Harris, M. F., & Russell, G. (2013). Patient-centred access to health care: conceptualising access at the interface of health systems and populations. *International journal for equity in health*, 12(1), 1-9.
- Lewis, S., Heard, R., Robinson, J., White, K., & Poulos, A. (2008). The ethical commitment of Australian radiographers: does medical dominance create an influence? *Radiography*, 14(2), 90-97.
- Lincoln, Y. S., Lynham, S. A., & Guba, E. G. (2018). Paradigmatic controversies, contradictions, and emerging confluences, revisited. In N. Denzin & Y. Lincoln (Eds.), *The Sage handbook of qualitative research* (pp. 108-150). Sage Publishing.
- Long, T., & Johnson, M. (2000). Rigour, reliability and validity in qualitative research. *Clinical Effectiveness in Nursing*, 4(1), 30-37.
- MacDougall, C., Epstein, M., & Highet, L. (2017). Continuing professional development: putting the learner back at the centre. *Archives of Disease in Childhood-Education and Practice*, 102(5), 249-253.
- Madden, C., & Mitchell, V. A. (1993). *Professions, standards and competence: a survey of continuing education for the professions*. Bristol University, Department of Continuing Education.
- Malhotra, Y. (2008). Information Ecology and Knowledge Management. In L. D. Kiel (Ed.), *Knowledge Management, Organizational Intelligence and Learning, and Complexity: The implications of complexity* (Vol. 3, pp. 1-10). EOLSS Publications.
- Manley, K., Martin, A., Jackson, C., & Wright, T. (2018). A realist synthesis of effective continuing professional development (CPD): A case study of healthcare practitioners' CPD. *Nurse Education Today*, 69, 134-141.
- Mantzavinos, C. (2016, February 24, 2017). *Hermeneutics*. Stanford Encyclopedia of Philosophy. Retrieved February 24, 2017 from <https://plato.stanford.edu/archives/win2016/entries/hermeneutics/>
- Markauskaite, L., & Goodyear, P. (2017). *Epistemic fluency and professional education*. Springer.
- Martin, G. P., Armstrong, N., Aveling, E.-L., Herbert, G., & Dixon-Woods, M. (2015). Professionalism redundant, reshaped, or reinvigorated? Realizing the “third logic” in contemporary health care. *Journal of Health and Social Behavior*, 56(3), 378-397.
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370-396.

- Mason, J. (2002). Linking qualitative and quantitative data analysis. In A. Bryman & R. Burgess (Eds.), *Analysing qualitative data* (Vol. 11, pp. 103-124). Routledge.
- Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews. *Forum: qualitative social research*, 11(3), 1-12.
- Mathur, S., Stanton, S., & Reid, W. D. (2005). Canadian physical therapists' interest in web-based and computer-assisted continuing education. *Physical Therapy*, 85(3), 226-237.
- McDermott, H., Husbands, A., & Brooks-Lewis, L. (2018). Collaborative team reflective practice in trauma service to improve health care. *Journal of Trauma Nursing*, 25(6), 374-380.
- McGregor, R., O'Loughlin, K., Cox, J., Clarke, J., & Snowden, A. (2009). Sonographer practitioner development in Australia: Qualitative analysis of an Australian sonographers' survey. *Radiography*, 15(4), 313-319.
- Meyers, M. C., van Woerkom, M., de Reuver, R. S., Bakk, Z., & Oberski, D. L. (2015). Enhancing psychological capital and personal growth initiative: working on strengths or deficiencies. *Journal of Counseling Psychology*, 62(1), 50.
- Mezirow, J. (1991). *Transformative dimensions of adult learning*. Jossey-Bass.
- Micallef, R., & Kayyali, R. (2019). A systematic review of models used and preferences for continuing education and continuing professional development of pharmacists. *Pharmacy*, 7(4), 154.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Sage Publications.
- Mittal, S., & Kumar, V. (2019). Study of knowledge management models and their relevance in organisations. *International Journal of Knowledge Management Studies*, 10(3), 322-335.
- Mokyr, J. (2018). The Industrial Revolution: A Useful Abstraction. In J. Mokyr (Ed.), *The British industrial revolution: an economic perspective*. Routledge.
- Moore Jr, D. E., Green, J. S., & Gallis, H. A. (2009). Achieving desired results and improved outcomes: integrating planning and assessment throughout learning activities. *Journal of Continuing Education in the Health Professions*, 29(1), 1-15.
- Morris, T. H. (2019). Adaptivity through self-directed learning to meet the challenges of our ever-changing world. *Adult Learning*, 30(2), 56-66.
- Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification strategies for establishing reliability and validity in qualitative research. *International journal of qualitative methods*, 1(2), 13-22.
- MRPBA. (2015). *Guidelines: Continuing Professional Development*. Medical Radiation Practice Board of Australia. Retrieved March 29, 2016 from <http://www.medicalradiationpracticeboard.gov.au/Codes-Guidelines/Codes-and-Guidelines.aspx>
- MRPBA. (2017). *Medical Radiation Practice Board of Australia* Retrieved October 9th, 2017 from <http://www.medicalradiationpracticeboard.gov.au/>
- MRPBA. (2020). *Professional capabilities for medical radiation practice*. Medical Radiation Practice Board AHPRA. Retrieved March 19, 2020 from <https://www.medicalradiationpracticeboard.gov.au/Registration/Professional-Capabilities.aspx>

- MRPBA. (2021). *Medical Radiation Practice Board of Australia Registrant data: Reporting period: 01 January 2021 to 31 March 2021*. Medical Radiation Practice Board AHPRA. Retrieved April 19, 2022 from <http://www.medicalradiationpracticeboard.gov.au/>
- MRPBA. (2022). *Continuing Professional Development Standards*. Medical Radiation Practice Board of Australia. Retrieved April 9, 2022 from <https://www.medicalradiationpracticeboard.gov.au/Registration-Standards/CPD.aspx>
- Murphy, G. A., & Calway, B. A. (2007). Education for professionals through work-integrated learning. AARE 2006 Conference, Adelaide, Australia.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242-266.
- Nancarrow, S., & Borthwick, A. (2021). *The allied health professions: a sociological perspective*. Policy Press.
- Naylor, S., Booth, S., Harvey-Lloyd, J., & Strudwick, R. (2022). Experiences of diagnostic radiographers through the Covid-19 pandemic. *Radiography*, 28(1), 187-192.
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization science*, 5(1), 14-37.
- Nonaka, I., & Konno, N. (1998). The concept of “Ba”: Building a foundation for knowledge creation. *California Management Review*, 40(3), 40-54.
- Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press.
- O’Byrne, D., & Dell’Aquila, E. (2014). Defining Soft Skills and Their Added Value to Social Enterprises. In D. O’Byrne & J. Moizer (Eds.), *S-Cube Project (S 3): Training Soft Skills In Social Enterprises Using Virtual Environments for Role Play* (pp. 28-40). University of Plymouth Press.
- O’Gorman, K., & MacIntosh, R. (2015). Mapping research methods. In K. O’Gorman & R. MacIntosh (Eds.), *Research methods for business and management* (2nd ed., pp. 50-74). Goodfellow Publishers.
- OECD. (2007). *Qualifications Systems: Bridges to Lifelong Learning*. Organisation for Economic Co-operation and Development. Retrieved February 24, 2020 from <http://www.oecd.org/education/innovation-education/38465471.pdf>
- OECD. (2017). *Enrolment rate in secondary and tertiary education*. Organisation for Economic Co-operation and Development. Retrieved January 30, 2020 from <https://data.oecd.org/students/enrolment-rate-in-secondary-and-tertiary-education.htm>
- Ormiston, G. L., & Schrift, A. D. (Eds.). (1990). *The Hermeneutic Tradition: From Ast to Ricoeur*. State University of New York Press.
- Orzano, A. J., McInerney, C. R., Scharf, D., Tallia, A. F., & Crabtree, B. F. (2008). A knowledge management model: Implications for enhancing quality in health care. *Journal of the American Society for Information Science and Technology*, 59(3), 489-505.
- Oxford University. (2022). *Oxford English Dictionary*. Oxford University Press. Retrieved May 24, 2022 from <https://www.oed.com/>



- Pacharapha, T., & Ractham, V. V. (2012). Knowledge acquisition: the roles of perceived value of knowledge content and source. *Journal of knowledge management*, 16(5), 724-739.
- Page, S. E., & Zelner, J. (2020). Population Health as a Complex Adaptive System of Systems. In Y. Apostolopoulos, K. H. Lich, & M. K. Lemke (Eds.), *Complex Systems and Population Health* (pp. 33-44). Oxford University Press.
- Palonen, T., & Hakkarainen, K. (2014). Social network analyses of learning at workplaces. In C. Harteis, A. Rausch, & J. Seifried (Eds.), *Discourses on professional learning: On the Boundary Between Learning and Working* (pp. 293-315). Springer.
- Panahi, S., Watson, J., & Partridge, H. (2013). Towards tacit knowledge sharing over social web tools. *Journal of knowledge management*, 17(3), 1-23.
- Patton, M. Q. (2015). *Qualitative research and evaluation methods* (4th ed.). Sage Publications.
- PBA. (2015). *Guidelines for continuing professional development*. Canberra, ACT: Physiotherapy Board of Australia Retrieved from <http://www.physiotherapyboard.gov.au/Codes-Guidelines.aspx>
- PBA. (2021). *Physiotherapy Board of Australia Registrant data: Reporting period 01 January 2021 to 31 March 2021*. Physiotherapy Board of Australia. Retrieved May 6, 2022 from <https://www.physiotherapyboard.gov.au/About/Statistics.aspx>
- PBA. (2022). *Continuing professional development guidelines*. Physiotherapy Board of Australia. Retrieved April 9, 2022 from <https://www.physiotherapyboard.gov.au/Codes-Guidelines/CPD-guidelines.aspx>
- Peck, B., & Mummery, J. (2018). Hermeneutic constructivism: An ontology for qualitative research. *Qualitative Health Research*, 28(3), 389-407.
- Pekkola, E., Carvalho, T., Siekkinen, T., & Johansson, J. E. (2018). The sociology of professions and the study of academic profession. In E. Pekkola, J. Kivisto, V. Kohtamaki, Y. Cai, & A. Lyytinen (Eds.), *Theoretical and Methodological Perspectives on Higher Education Management and Transformation: An advanced reader for PhD students* (pp. 121-150). Tampere University Press.
- Phillips, M. (2011). *The role of self-direction in Australian sonographers' professional development* [Doctor of Philosophy, Deakin University]. Geelong, AU.
- Plack, M. M., & Greenberg, L. (2005). The reflective practitioner: reaching for excellence in practice. *Pediatrics*, 116(6), 1546-1552.
- Poell, R. F., & Van Der Krogt, F. J. (2016). Employee strategies in organising professional development. In S. Billett, D. Dymock, & S. Choy (Eds.), *Supporting learning across working life* (pp. 29-46). Springer International Publishing
- Polanyi, M. (1961). II.—Knowing and being. *Mind*, 70(280), 458-470.
- Polit, D. F., & Beck, C. T. (2010). Generalization in quantitative and qualitative research: Myths and strategies. *International Journal of Nursing Studies*, 47(11), 1451-1458.
- Polkinghorne, D. E. (2007). Validity issues in narrative research. *Qualitative inquiry*, 13(4), 471-486.

- Pool, I. A., Poell, R. F., Berings, M. G., & ten Cate, O. (2016). Motives and activities for continuing professional development: An exploration of their relationships by integrating literature and interview data. *Nurse Education Today*, 38, 22-28.
- Popkewitz, T. S. (1994). Professionalization in teaching and teacher education: Some notes on its history, ideology, and potential. *Teaching and teacher education*, 10(1), 1-14.
- Quinn, J. B., Anderson, P., & Finkelstein, S. (1996). Managing professional intellect: making the most of the best. *Harvard Business Review*(March-April), 71-80.
- Ramani, S., McMahon, G. T., & Armstrong, E. G. (2019). Continuing professional development to foster behaviour change: From principles to practice in health professions education. *Medical Teacher*, 41(9), 1045-1052.
- Rappolt, S., & Tassone, M. (2002). How rehabilitation therapists gather, evaluate, and implement new knowledge. *Journal of Continuing Education in the Health Professions*, 22(3), 170-180.
- Reber, A. S. (1989). Implicit learning and tacit knowledge. *Journal of Experimental Psychology: General*, 118(3), 219.
- Richardson, B. (1999). Professional development: 1. Professional socialisation and professionalisation. *Physiotherapy*, 85(9), 461-467.
- Rigby, C. S., & Ryan, R. M. (2018). Self-determination theory in human resource development: New directions and practical considerations. *Advances in Developing Human Resources*, 20(2), 133-147.
- Ritchie, J., & Spencer, L. (2002). Qualitative data analysis for applied policy research. In A. Bryman & R. Burgess (Eds.), *Analyzing qualitative data* (pp. 173-194). Routledge.
- Rittel, H. W., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy sciences*, 4(2), 155-169.
- Roberts, J. (2006). Limits to communities of practice. *Journal of management studies*, 43(3), 623-639.
- Romer, I. (2016). Method. In N. Keane & C. Lawn (Eds.), *The Blackwell companion to Hermeneutics* (pp. 86-95). John Wiley & Sons.
- Rosenberg, C. E. (2002). The tyranny of diagnosis: specific entities and individual experience. *The milbank quarterly*, 80(2), 237-260.
- Roulston, K. (2010). *Reflective interviewing: A guide to theory and practice*. Sage Publications.
- Rowley, J. (1999). What is knowledge management? *Library management*, 20(8), 416-420.
- Rubtcova, M., & Pavenkov, O. (2018). Knowledge Management Models in Organizations. IASTEM-463rd International Conference on Science Technology and Management (ICSTM) 24th-25th September, Pune, Maharashtra, India.
- Rumianowska, A. (2020). Existential perspectives on education. *Educational Philosophy and Theory*, 52(3), 261-269.
- Sachdeva, A. K. (2016). Continuing professional development in the twenty-first century. *Journal of Continuing Education in the Health Professions*, 36, S8-S13.

- Sajeva, S., & Jucevicius, R. (2010). Determination of Essential Knowledge Management System Components and their Parameters. *Social Sciences/Socialiniai Mokslai*, 1(67), 80-90.
- Samoilenko, N., & Nahar, N. (2013). Knowledge sharing and application in complex software and systems development in globally distributed high-tech organizations using suitable IT tools. 2013 Proceedings of PICMET'13: Technology Management in the IT-Driven Services (PICMET), San Jose, CA, USA.
- Sanchez, R. (2006). Knowledge management and organizational learning: Fundamental concepts for theory and practice. In B. Renzl, K. Matzler, & H. Hinterhuber (Eds.), *The future of knowledge management* (pp. 29-61). Palgrave Macmillan.
- Sandars, J., Langlois, M., & Waterman, H. (2007). Online collaborative learning for healthcare continuing professional development: a cross-case analysis of three case studies. *Medical Teacher*, 29(1), e9-e17.
- Sargeant, J., Borduas, F., Sales, A., Klein, D., Lynn, B., & Stenerson, H. (2011). CPD and KT: models used and opportunities for synergy. *Journal of Continuing Education in the Health Professions*, 31(3), 167-173.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*. Pearson Education.
- Scanlon, C., & Darkenwald, G. (1984). Identifying deterrents to participation in continuing education. *Adult Education Quarterly*, 24, 114-122.
- Schenk, P. J. (2014). *Continuing professional development and evidence-based practice in Physiotherapy*. (Unpublished honours thesis), Federation University Australia.
- Schleiermacher, F. D. (1990). The hermeneutics: Outline of the 1819 lectures (J. Wojcik & R. Haas, Trans.). In G. L. Ormiston & D. Scharf (Eds.), *The Hermeneutic Tradition: From Ast to Ricoeur* (pp. 85-100). State University of New York Press (Original work published 1819).
- Schön, D. A. (1991). *The Reflective Practitioner: How Professionals Think in Action*. Routledge.
- Schostak, J., Davis, M., Hanson, J., Schostak, J., Brown, T., Driscoll, P., Starke, I., & Jenkins, N. (2010). *The Effectiveness of Continuing Professional Development: A report prepared on behalf of College of Emergency Medicine, Federation of Royal Colleges of Physicians and Manchester Metropolitan University*
- Science Portfolio. (2015). *Science and Research Priorities Factsheet*. Australian Government. Retrieved February 4, 2016 from <https://www.industry.gov.au/science-technology-and-innovation>
- Selinger, E. M., & Crease, R. P. (2002). Dreyfus on expertise: the limits of phenomenological analysis. *Continental Philosophy Review*, 35(3), 245-279.
- Sheng, M. L., Chang, S. Y., Teo, T., & Lin, Y. F. (2013). Knowledge barriers, knowledge transfer, and innovation competitive advantage in healthcare settings. *Management Decision*, 51(3), 461-478.
- Shongwe, M. M. (2016). An analysis of knowledge management lifecycle frameworks: Towards a unified framework. *Electronic Journal of Knowledge Management*, 14(3), 140-153.
- Short, S. D. (1986). Physiotherapy—a feminine profession. *Australian Journal of Physiotherapy*, 32(4), 241-243.

- Sim, J., & Radloff, A. (2009). Profession and professionalisation in medical radiation science as an emergent profession. *Radiography*, 15(3), 203-208.
- Smith, J., Flowers, P., & Larkin, M. (2009). *Interpretative phenomenological analysis: Theory, method and research*. Sage Publications.
- Smith, M., Meyer, S., Stagnitti, K., & Schoo, A. (2009). Knowledge and reasoning in practice: An example from physiotherapy and occupational therapy. In *Knowledge-in-practice in the caring professions: Multidisciplinary perspectives* (pp. 193-212). Ashgate Publishing.
- Smith, T. (2009). A short history of the origins of radiography in Australia. *Radiography*, 15, e42-e47.
- Spencer, L., Ritchie, J., & O'Connor, W. (2003). Analysis: practices, principles and processes. In J. Ritchie & J. Lewis (Eds.), *Qualitative research practice: A guide for social science students and researchers* (pp. 199-218). Sage Publications.
- Spencer, L., Ritchie, J., Ormston, R., O'Connor, W., & Barnard, M. (2013). Analysis: Principles and Processes. In J. Ritchie, J. Lewis, C. Nicholls, & R. Ormston (Eds.), *Qualitative research practice: A guide for social science students and researchers* (2nd ed., pp. 269-293). National Centre for Social Research (NatCen).
- Stagnitti, K., Schoo, A., Reid, C., & Dunbar, J. (2005). Access and attitude of rural allied health professionals to CPD and training. *International journal of therapy and rehabilitation*, 12(8), 355-362.
- Stefanovski, R. (2020). The Importance of Soft Skills in The Improvement of The Work of Employees in Healthcare Institutions. *Journal of Research and Opinion*, 7(3), 2671-2675.
- Strandmark, M. (2015). Method development at Nordic school of public health NHV: Phenomenology and grounded theory. *Scandinavian Journal of Public Health*, 43(16\_suppl), 61-65.
- Struber, J. C. (2003). Physiotherapy in Australia-Where to now? *Internet journal of allied health sciences and practice*, 1(2), 1-5.
- Sundler, A. J., Lindberg, E., Nilsson, C., & Palmér, L. (2019). Qualitative thematic analysis based on descriptive phenomenology. *Nursing Open*, 6(3), 733-739.
- Susskind, D., & Susskind, R. (2018). The future of the professions 1. *Proceedings of the American Philosophical Society*, 162(2), 125-138.
- Susskind, R., & Susskind, D. (2016). *The Future of Professions: How Technology Will Transform the Work of Human Experts*. Oxford University Press
- Sussman, S. W., & Siegal, W. S. (2003). Informational influence in organizations: An integrated approach to knowledge adoption. *Information systems research*, 14(1), 47-65.
- Svensson, L., Ellström, P. E., & Åberg, C. (2004). Integrating formal and informal learning at work. *Journal of workplace learning*, 16(8), 479-491.
- Swanson, R. A., & Holton, E. F. (2001). *Foundations of human resource development*. Berrett-Koehler Publishers.
- Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic management journal*, 17(2), 27-43.

- Tan, C. (2017). A Confucian perspective of self-cultivation in learning: Its implications for self-directed learning. *Journal of Adult and Continuing Education*, 23(2), 250-262.
- ten Cate, O. (2017). Competency-based medical education and its competency frameworks. In M. Mulder (Ed.), *Competence-based Vocational and Professional Education: Bridging the Worlds of Work and Education* (Vol. 23, pp. 903-929). Springer International Publishing
- Terwindt, F., Rajan, D., & Soucat, A. (2016). Priority-setting for national health policies, strategies and plans. In *Strategizing national health in the 21st century: a handbook*. World Health Organization.
- Tham, R., & Ward, B. (2016). Rural health systems: spotlight on equity and access. In E. Willis, L. Reynolds, & H. Keleher (Eds.), *Understanding the Australian Health Care System* (3rd ed., pp. 139-152). Elsevier Health Sciences.
- Thompson, C., Williams, K., Morris, D., Bird, S., Kobel, C., Andersen, P., Eckermann, S., Quinsey, K., & Masso, M. (2014). *HWA Expanded Scopes of Practice program evaluation: Physiotherapists in the Emergency Department sub-project: final report*. Centre for Health Service Development, Australian Health Services Research Institute, University of Wollongong. Retrieved March 19, 2016 from <https://www.uow.edu.au/ahsri/research/projects/2014-projects/>
- Triandis, H. (1980). Values, Attitudes, and Interpersonal Behavior. Nebraska Symposium on Motivation, University of Nebraska.
- Tsoukas, H. (1996). The firm as a distributed knowledge system: A constructionist approach. *Strategic management journal*, 17(S2), 11-25.
- Urcia, I. A. (2021). Comparisons of Adaptations in Grounded Theory and Phenomenology: Selecting the Specific Qualitative Research Methodology. *International journal of qualitative methods*, 20, 1-14.
- Usman, U. A., & Ogbu, J. E. (2019). Application of classical and operant conditioning theories of learning in cooperative member education and staff training. *Global Journal of Applied Management and Social Sciences*, 16, 1-6.
- Vaismoradi, M., Jones, J., Turunen, H., & Snelgrove, S. (2016). Theme development in qualitative content analysis and thematic analysis. *Journal of Nursing Education and Practice*, 5(5), 100-110.
- van Beveren, J. (2002). A model of knowledge acquisition that refocuses knowledge management. *Journal of knowledge management*, 6(1), 18-22.
- Ward, B., & Tham, R. (2020). Rural health systems: spotlight on equity and access. In E. Willis, L. Reynolds, & T. Rudge (Eds.), *Understanding the Australian Health Care System* (4th ed., pp. 136-154). Elsevier Australia.
- Ward, P., Gore, J., Hutton, R., Conway, G. E., & Hoffman, R. R. (2018). Adaptive skill as the conditio sine qua non of expertise. *Journal of applied research in memory and cognition*, 7(1), 35-50.
- Wareing, A., Buissink, C., Harper, D., Olesen, M. G., Soto, M., Braico, S., Van Laer, P., Gremion, I., & Rainford, L. (2017). Continuing professional development (CPD) in radiography: A collaborative European meta-ethnography literature review. *Radiography*, 23, S58-S63.

- Warner, J. H. (2014). The Art of Medicine in an Age of Science: Reductionism, Holism, and the Doctor-Patient Relationship in the United States, 1890–1960. *Senri Ethnological Reports*, 120, 55-91.
- WCPT. (2011). *Policy Statement; Description of physical therapy*. World Confederation for Physical Therapy. Retrieved August 12, 2014 from [http://www.wcpt.org/sites/wcpt.org/files/files/PS\\_Description\\_PT\\_Sept2011\\_FO\\_RMATTED\\_edit2013.pdf](http://www.wcpt.org/sites/wcpt.org/files/files/PS_Description_PT_Sept2011_FO_RMATTED_edit2013.pdf)
- Weadon, H. A. (2007). *Teacher Learning Matters: The interrelationship between the personal and professional lives of rural teachers*. [Doctor of Education, Australian Catholic University]. Ballarat, AU.
- Webster-Wright, A. (2009). Reframing professional development through understanding authentic professional learning. *Review of educational research*, 79(2), 702-739.
- Weiss, R. S. (1994). *Learning from strangers: The art and method of qualitative interview studies*. Free Press.
- Wenger-Trayner, E., & Wenger-Trayner, B. (2015). Learning in landscapes of practice: A Framework. In E. Wenger-Trayner, M. Fenton-O'Creevy, S. Hutchinson, C. Kubiak, & B. Wenger-Trayner (Eds.), *Learning in landscapes of practice: Boundaries, identity, and knowledgeability in practice-based learning*. Routledge.
- Wenger, E. (1990). *Toward a theory of cultural transparency: Elements of a social discourse of the visible and the invisible*. (Unpublished doctoral dissertation), University of California.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge University Press.
- Wenger, E. (2004). Knowledge management as a doughnut: Shaping your knowledge strategy through communities of practice. *Ivey business journal*, 68(3), 1-8.
- Wenger, E. (2006). *Communities of practice in and across 21st century organizations*. Retrieved March 7, 2020 from [http://sitios.itesm.mx/va/dide2/enc\\_innov/doctos/Article21\\_century\\_organizations.pdf](http://sitios.itesm.mx/va/dide2/enc_innov/doctos/Article21_century_organizations.pdf)
- Wenger, E. (2010). Communities of practice and social learning systems: the career of a concept. In C. Blackmore (Ed.), *Social learning systems and communities of practice* (pp. 179-198). Springer.
- Wenger, E., McDermott, R. A., & Snyder, W. (2002). *Cultivating communities of practice: A guide to managing knowledge*. Harvard Business School Press.
- Willis, E., Reynolds, L., & Keleher, H. (2016). *Understanding the Australian health care system* (3rd ed.). Elsevier Health Sciences.
- Willis, E., Reynolds, L., & Rudge, T. (2020). *Understanding the Australian health care system* (4th ed.). Elsevier Australia.
- Wilson, A. M., Delbridge, R., & Palermo, C. (2017). Supporting dietitians to work in Aboriginal health: Qualitative evaluation of a Community of Practice mentoring circle. *Nutrition & Dietetics*, 74(5), 488-494.
- Wlodkowski, R. J., & Ginsberg, M. B. (2017). *Enhancing adult motivation to learn: A comprehensive guide for teaching all adults*. John Wiley & Sons.
- Yang, J.-T. (2007). Knowledge sharing: Investigating appropriate leadership roles and collaborative culture. *Tourism management*, 28(2), 530-543.

- Yardley, S., & Dornan, T. (2012). Kirkpatrick's levels and education 'evidence'. *Medical Education*, 46(1), 97–106.
- Yates, C., Partridge, H., & Bruce, C. (2012). Exploring information experiences through phenomenography. *Library and Information Research*, 36(112), 96-119.
- Yielder, J. (2014). Creating our future: conformity or change? *Journal of medical radiation sciences*, 61(2), 63-65.
- Yielder, J., & Davis, M. (2009). Where radiographers fear to tread: Resistance and apathy in radiography practice. *Radiography*, 15(4), 345-350.
- Yin, R. K. (2003). Designing case studies. In L. Maruster & M. Gijzenberg (Eds.), *Qualitative Research Methods* (pp. 359-399). Sage Publishing.
- Yin, R. K. (2012). *Applications of case study research* (3rd ed.). Sage Publishing.
- Yin, R. K. (2014). *Case Study Research: Design and Methods* (5th ed.). Sage Publishing.

# Appendices

## Appendix A

### *Participant Information / Hospital Managers*

**Title:** Continuing Professional Development of Allied Health Professionals: A Regional Study

**Short Title** CPD in Allied Health

**Coordinating Principal Researcher** Dr Jacqueline Tuck

**Principal Researcher / Supervisor** Dr Helen Weadon

**Associate Researcher / Student** Mr Peter Schenk

---

### **Part 1: What does my participation involve?**

#### **1 Introduction**

Your hospital has agreed to participate in the research project entitled *Continuing Professional Development of Allied Health Professionals: A Regional Study*. This document tells you about the project and explains the processes involved, to help you decide if you would like to take part. If you decide you want to take part in the research project, you will be asked to sign the consent section. By signing it you are telling us that you:

- Understand what you have read
- Consent to take part in the research project
- Consent to the research as described
- Consent to the use of your personal information as described.

Further information is available by contacting Peter Schenk by email:  
[pj.schenk@federation.edu.au](mailto:pj.schenk@federation.edu.au)

#### **2 What is the purpose of this research?**

One of the aims of this study is to explore your management experiences as they relate to human resource development of allied health professionals and this hospitals approach to knowledge management. This project will fill gaps in knowledge regarding regional allied health professionals' CPD; and regional hospitals' approaches to CPD and knowledge management.

The results of this research will also be used by Mr Peter Schenk toward obtaining a Doctor of Philosophy (PhD) under the supervision of Dr Jacqueline Tuck and Dr Helen Weadon at the Federation Business School (Ballarat), Federation University Australia.

#### **3 What does participation in this research involve?**

Personal one-on-one interviews will be used to collect information for the research. The interviews will be conducted by Peter Schenk who has past experience working as an allied health professional and manager in Medical Imaging. The interviews are expected to take between 45 and 60 minutes and will be digitally recorded, transcribed and analysed by the researchers. There are no costs associated with participating in this research project, nor will you receive any payment.



#### **4 Other relevant information about the research project**

It is planned that 68 people will be interviewed from the regional hospitals involved in the study.

#### **5 Do I have to take part in this research project?**

Participation in the research project is completely voluntary and declining to participate requires no further explanation from you.

#### **6 What are the possible benefits to me of taking part?**

We cannot guarantee or promise that you will receive any benefits from this research; however, the insights generated may be useful to you and other managers in similar settings.

#### **7 What are the possible risks and disadvantages of taking part?**

The interview will be conducted at your workplace in a private and confidential setting. Although no questions are anticipated to be of a personal nature, participants may decline to answer any question during the interview. No potential risks are foreseen; however, in the unlikely event you experience any distress the interview will cease immediately and you can contact your GP.

#### **8 What if I withdraw from this research project?**

If you do consent to participate, you may withdraw at any time until the data has been aggregated. If you decide to withdraw from this research the process is as follows:

- **Prior to the interview** - contact the Coordinating Principal Researcher, Dr Jacqueline Tuck by phone or email and your involvement in the project will cease immediately.
- **During the interview** tell the interviewer that you wish to withdraw from the study and the interview will cease immediately and the interview recording will be deleted.
- **After the interview** - contact the Coordinating Principal Researcher by phone or e-mail. If the data has not been aggregated, all your data will be deleted and the information collected in your interview will not be used in the research. However, if the data has been aggregated you will be informed that it is no longer possible to withdraw your consent.

#### **9 What happens when the research project ends?**

Results of the research will be distributed in summary form to participating individuals and hospitals as well as being published in the form of a thesis and conference or journal articles.

### **Part 2: How is the research project being conducted?**

#### **10 What will happen to information about me?**

By signing the consent form you consent to the research team collecting and using personal information about you for the research project. Any information obtained in connection with this research project that can identify you will remain confidential. Identifiable data about you or your hospital will be replaced by a code, digital files and paper documents will be securely stored at Federation University Australia. Access to the data will be limited to the researchers named above. Your information will only be used for the purpose of this research project and it will only be disclosed with your permission, except as required by law. The personal information that the research team collect and use is from questionnaires and interviews. The research data will be stored securely for 5 years after the study concludes, after which digital files (including audio recordings) will be erased and any paper documents will be shredded.

It is anticipated that the results of this research project will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be provided in such a way that you cannot be identified, except with your express permission. Any information will be de-identified and presented using a pseudonym so that neither you nor your hospital can be identified.

In accordance with relevant Australian and/or Victorian privacy and other relevant laws, you have the right to request access to the information about you that is collected and stored by the research team. You also have the right to request that any information with which you disagree be corrected. Please inform the research team member named at the end of this document if you would like to access your information. Any information obtained for the purpose of this research project that can identify you will be treated as confidential and securely stored. It will be disclosed only with your permission, or as required by law.

**12 Who is organising and funding the research?**

This research project is being conducted by Peter Schenk under the auspices of the Federation Business School (Ballarat), Federation University Australia. No member of the research team will receive a personal financial benefit from this research project (other than their ordinary wages).

**13 Who has reviewed the research project?**

The ethical aspects of this research project have been approved by the HREC of Austin Health and ratified by the HREC of Federation University Australia. This project will be carried out according to the National Statement on Ethical Conduct in Human Research (2007, updated May 2015). This statement has been developed to protect the interests of people who agree to participate in human research studies.

**14 Further information and who to contact**

If you have any questions, or you would like further information regarding the project titled **Continuing Professional Development of Allied health Professionals: A Regional Study** contact:

**Research contact person**

Coordinating Principal Researcher	Federation University Australia Dr Jacqueline Tuck
Phone	(03) 5327 9889
email	j.tuck@federation.edu.au

For matters relating to research at the site at which you are participating, the details of the local site complaints person are:

**Complaints contact person**

Name	[Name]
Position	[Position]
Phone	[Phone]
email	[email address]

**Reviewing HREC approving this research and HREC Executive Officer details**

Reviewing HREC name	Austin Health Human Research Ethics Committee
HREC Executive Officer	Ms Chelsea Webster
Phone	(03) 9496 4090
email	ethics@austin.org.au

## Appendix B

### *Participant Information / Allied Health Professionals*

**Title:** Continuing Professional Development of Allied Health Professionals: A Regional Study

**Short Title** CPD in Allied Health

**Coordinating Principal Researcher** Dr Jacqueline Tuck

**Principal Researcher / Supervisor** Dr Helen Weadon

**Associate Researcher/Student** Mr Peter Schenk

---

#### **Part 1: What does my participation involve?**

##### **1 Introduction**

Your hospital has agreed to participate in the research project entitled *Continuing Professional Development of Allied Health Professionals: A Regional Study*. This document tells you about the project and explains the processes involved, to help you decide if you would like to take part. If you decide you want to take part in the research project, you will be asked to sign the consent section. By signing it you are telling us that you:

- Understand what you have read
- Consent to take part in the research project
- Consent to the research as described
- Consent to the use of your personal information as described.

Further information is available by contacting Peter Schenk by email:  
[pj.schenk@federation.edu.au](mailto:pj.schenk@federation.edu.au)

##### **2 What is the purpose of this research?**

The aim of this study is to explore your experiences with continuing professional development (CPD). This project will fill gaps in knowledge regarding regional allied health professionals' CPD and regional hospitals' approaches to CPD and knowledge management.

The results of this research will also be used by Mr Peter Schenk toward obtaining a Doctor of Philosophy (PhD) under the supervision of Dr Jacqueline Tuck and Dr Helen Weadon at the Federation Business School (Ballarat), Federation University Australia.

##### **3 What does participation in this research involve?**

A questionnaire and personal one-on-one interviews will be used to collect information for the research. The interviews will be conducted by Peter Schenk who has past experience working as an allied health professional in Medical Imaging. The interviews are expected to take between 45 and 60 minutes and will be digitally recorded, transcribed and analysed by the researchers. There are no costs associated with participating in this research project, nor will you receive any payment.

##### **4 Other relevant information about the research project**

It is planned that 68 people will be interviewed from the regional hospitals involved in the study.

##### **5 Do I have to take part in this research project?**

Participation in the research project is completely voluntary and declining to participate requires no further explanation from you.

## **6 What are the possible benefits to me of taking part?**

We cannot guarantee or promise that you will receive any benefits from this research; however, participation may be used for your own CPD and there is potential for reflective practice regarding your professional development planning and choices.

## **7 What are the possible risks and disadvantages of taking part?**

The interview will be conducted at your workplace in a private and confidential setting. Although no questions are anticipated to be of a personal nature, participants may decline to answer any question during the interview. No potential risks are foreseen; however, in the unlikely event you experience any distress the interview will immediately cease and you can contact your GP.

## **8 What if I withdraw from this research project?**

If you do consent to participate, you may withdraw at any time until the data has been aggregated. If you wish to withdraw from this research the process is as follows:

- **Prior to the interview** - contact the Coordinating Principal Researcher, Dr Jacqueline Tuck by phone or email and your involvement in the project will cease immediately.
- **During the interview** - tell the interviewer that you wish to withdraw from the study and the interview will cease immediately and the interview recording will be deleted.
- **After the interview** - contact the Coordinating Principal Researcher by phone or e-mail. If the data has not been aggregated, all your data will be deleted and the information collected in your interview will not be used in the research. However, if the data has been aggregated you will be informed that it is no longer possible to withdraw your consent.

## **9 What happens when the research project ends?**

Results of the research will be distributed in summary form to participating individuals and hospitals as well as being published in the form of a thesis and conference or journal articles.

## **Part 2: How is the research project being conducted?**

### **10 What will happen to information about me?**

By signing the consent form you consent to the research team collecting and using personal information about you for the research project. Any information obtained in connection with this research project that can identify you will remain confidential. Identifiable data will be replaced by a code, digital files and paper documents will be securely stored at Federation University Australia. Access to the data will be limited to the researchers named above. Your information will only be used for the purpose of this research project and it will only be disclosed with your permission, except as required by law. The personal information that the research team collect and use is from questionnaires and interviews. The research data will be stored securely for 5 years after the study concludes, after which digital files (including audio recordings) will be erased and any paper documents will be shredded.

It is anticipated that the results of this research project will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be provided in such a way that you cannot be identified, except with your express permission. Any information will be de-identified and presented using a pseudonym so that neither you nor your hospital can be identified.

In accordance with relevant Australian and/or Victorian privacy and other relevant laws, you have the right to request access to the information about you that is collected and stored by the research team. You also have the right to request that any information with which you disagree be corrected. Please inform the research team member named at the end of this document if you would like to access your information. Any information obtained for the purpose of this research project that can identify you will be treated as confidential and securely stored. It will be disclosed only with your permission, or as required by law.

## 12 Who is organising and funding the research?

This research project is being conducted by Peter Schenk under the auspices of the Federation Business School (Ballarat), Federation University Australia. No member of the research team will receive a personal financial benefit from this research project (other than their ordinary wages).

## 13 Who has reviewed the research project?

The ethical aspects of this research project have been approved by the HREC of Austin Health and ratified by the HREC of Federation University Australia. This project will be carried out according to the National Statement on Ethical Conduct in Human Research (2007, updated May 2015). This statement has been developed to protect the interests of people who agree to participate in human research studies.

## 14 Further information and who to contact

If you have any questions, or you would like further information regarding the project titled **Continuing Professional Development of Allied Health Professionals: A Regional Study** contact:

### Research contact person

Coordinating Principal Researcher	Federation University Australia Dr Jacqueline Tuck
Phone	(03) 5327 9889
email	j.tuck@federation.edu.au

For matters relating to research at the site at which you are participating, the details of the local site complaints person are:

### Complaints contact person

Name	[Name]
Position	[Position]
Phone	[Phone]
email	[email address]

### Reviewing HREC approving this research and HREC Executive Officer details

Reviewing HREC name	Austin Health Human Research Ethics Committee
HREC Executive Officer	Ms Chelsea Webster
Phone	(03) 9496 4090
email	ethics@austin.org.au

**Appendix C**

**Consent Form**

**Title: Continuing Professional Development of Allied Health Professionals: A Regional Study**

**Coordinating Principal Researcher** Dr Jacqueline Tuck

**Principal Researcher / Supervisor** Dr Helen Weadon

**Associate Researcher/Student** Mr Peter Schenk

**Declaration by Participant**

The research program I am being asked to participate in has been explained to me, verbally and in writing and any information I have sought has been answered to my satisfaction.

I understand that:

- all information I provide will be treated with the strictest confidence and safeguarded subject to legal requirements, with data stored separately from any listing that includes my name and workplace.
- every effort will be made to maintain confidentiality, but that because of the small sample size it may not be possible to guarantee total anonymity.
- the interview will be recorded on a digital audio device and transcribed by the researcher.
- aggregated results will be used for research purposes and may be reported in scientific and academic journals.
- my participation in this research is voluntary and I am free to withdraw my consent at any time during the study; in which event my participation in the research study will immediately cease and any information obtained from it will not be used.
- once information has been aggregated it is unable to be identified and from this point it is not possible to withdraw consent to participate.

Name of Participant (please print)	_____	
Signature	_____	Date _____

**Declaration by Researcher**

I have provided the *Participant Information* sheet and given a verbal explanation of the research project, its procedures and risks and I believe that the participant has understood that explanation.

Name of Researcher (please print)	_____	
Signature	_____	Date _____

Note: All parties signing the consent section must date their own signature

## Appendix D

### *Taxonomy of Competency Domains for Healthcare Professions*

#### **1. Patient Care**

*Provide patient-centred care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health*

- 1.1 Perform all medical, diagnostic, and surgical procedures considered essential for the area of practice
- 1.2 Gather essential and accurate information about patients and their conditions through history-taking, physical examination, and the use of laboratory data, imaging, and other tests
- 1.3 Organise and prioritise responsibilities to provide care that is safe, effective, and efficient
- 1.4 Interpret laboratory data, imaging studies and other tests required for the area of practice
- 1.5 Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
- 1.6 Develop and carry out patient management plans
- 1.7 Counsel and educate patients and their families to empower them to participate in their care and enable shared decision-making
- 1.8 Provide appropriate referral of patients including ensuring continuity of care throughout transitions between providers or settings, and following up on patient progress and outcomes
- 1.9 Provide healthcare services to patients, families, and communities aimed at preventing health problems or maintaining health
- 1.10 Provide appropriate role modelling
- 1.11 Perform supervisory responsibilities commensurate with one's roles, abilities, and qualifications

#### **2. Knowledge for Practice**

*Demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioural sciences, as well as the application of this knowledge to patient care*

- 2.1 Demonstrate an investigatory and analytic approach to clinical situations
- 2.2 Apply established and emerging bio-physical scientific principles fundamental to healthcare for patients and populations
- 2.3 Apply established and emerging principles of clinical sciences to diagnostic and therapeutic decision-making, clinical problem-solving, and other aspects of evidence-based healthcare
- 2.4 Apply principles of epidemiological sciences to the identification of health problems, risk factors, treatment strategies, resources, and disease prevention/health promotion efforts for patients and populations
- 2.5 Apply principles of social-behavioural sciences to the provision of patient care, including assessment of the impact of psychosocial and cultural influences on health, disease, care-seeking, care compliance, and barriers to and attitudes toward care
- 2.6 Contribute to the creation, dissemination, application, and translation of new healthcare knowledge and practices

#### **3. Practice-Based Learning and Improvement**

*Demonstrate the ability to investigate and evaluate one's care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning*

- 3.1 Identify strengths, deficiencies, and limits in one's knowledge and expertise
- 3.2 Set learning and improvement goals
- 3.3 Identify and perform learning activities that address one's gaps in knowledge, skills, and attitudes
- 3.4 Systematically analyse practice using quality improvement methods and implement changes with the goal of practice improvement

- 3.5 Incorporate feedback into daily practice
- 3.6 Locate, appraise and assimilate evidence from scientific studies related to patients' health problems
- 3.7 Use information technology to optimise learning
- 3.8 Participate in the education of patients, families, students, trainees, peers, and other health professionals
- 3.9 Obtain and utilise information about individual patients, populations of patients, or communities from which patients are drawn to improve care
- 3.10 Continually identify, analyse, and implement new knowledge, guidelines, standards, technologies, products, or services that have been demonstrated to improve outcomes

#### **4. Interpersonal and Communication Skills**

*Demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals*

- 4.1 Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds
- 4.2 Communicate effectively with colleagues within one's profession or specialty, other health professionals, and health-related agencies (see also 7.3)
- 4.3 Work effectively with others as a member or leader of a healthcare team or other professional groups (see also 7.4)
- 4.4 Act in a consultative role to other health professionals
- 4.5 Maintain comprehensive, timely, and legible medical records
- 4.6 Demonstrate sensitivity, honesty, and compassion in difficult conversations, including those about death, end of life, adverse events, bad news, disclosure of errors, and other sensitive topics
- 4.7 Demonstrate insight and understanding about emotions and human responses to emotions that allow one to develop and manage interpersonal interactions

#### **5. Professionalism**

*Demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles*

- 5.1 Demonstrate compassion, integrity, and respect for others
- 5.2 Demonstrate responsiveness to patient needs that supersedes self-interest
- 5.3 Demonstrate respect for patient privacy and autonomy
- 5.4 Demonstrate accountability to patients, society, and the profession
- 5.5 Demonstrate sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation
- 5.6 Demonstrate a commitment to ethical principles pertaining to provision or withholding of care, confidentiality, informed consent, and business practices, including compliance with relevant laws, policies, and regulations

#### **6. Systems-Based Practice**

*Demonstrate an awareness of and responsiveness to the larger context and system of healthcare, as well as the ability to call effectively on other resources in the system to provide optimal healthcare*

- 6.1 Work effectively in various healthcare delivery settings and systems relevant to one's clinical specialty
- 6.2 Coordinate patient care within the healthcare system relevant to one's clinical specialty
- 6.3 Incorporate considerations of cost awareness and risk-benefit analysis in patient and population-based care
- 6.4 Advocate for quality patient care and optimal patient care systems
- 6.5 Participate in identifying system errors and implementing potential systems solutions



- 6.6 Perform administrative and practice management responsibilities commensurate with one's role, abilities, and qualifications

## **7. Interprofessional Collaboration**

*Demonstrate the ability to engage in an interprofessional team in a manner that optimises safe, effective patient- and population-centred care*

- 7.1 Work with other health professionals to establish and maintain a climate of mutual respect, dignity, diversity, ethical integrity, and trust
- 7.2 Use the knowledge of one's own role and the roles of other health professionals to appropriately assess and address the healthcare needs of the patients and populations served
- 7.3 Communicate with other health professionals in a responsive and responsible manner that supports the maintenance of health and the treatment of disease in individual patients and populations
- 7.4 Participate in different team roles to establish, develop, and continuously enhance interprofessional teams to provide patient- and population-centred care that is safe, timely, efficient, effective, and equitable

## **8. Personal and Professional Development**

*Demonstrate the qualities required to sustain lifelong personal and professional growth*

- 8.1 Develop the ability to use self-awareness of knowledge, skills, and emotional limitations to engage in appropriate help-seeking behaviours
- 8.2 Demonstrate healthy coping mechanisms to respond to stress
- 8.3 Manage conflict between personal and professional responsibilities
- 8.4 Practice flexibility and maturity in adjusting to change with the capacity to alter one's behaviour
- 8.5 Demonstrate trustworthiness that makes colleagues feel secure when one is responsible for the care of patients
- 8.6 Provide leadership skills that enhance team functioning, the learning environment, and the healthcare delivery system
- 8.7 Demonstrate self-confidence that puts patients, families, and members of the healthcare team at ease
- 8.8 Recognise that ambiguity is part of clinical healthcare and respond by utilising appropriate resources in dealing with uncertainty

Note: Englander et al. (2013, pp. 1091-1092).

## Appendix E

### Victorian Regional Acute Public Hospitals (2011-2012 Peer Groups)

State	Hospital Name	Remoteness Area	Available Beds	2011-12 Peer Group
VIC	Ballarat Health Services [Base Hospital Campus]	Inner Regional	245	Principal referral
VIC	Bendigo Hospital	Inner Regional	253	Principal referral
VIC	Goulburn Valley Health [Shepparton]	Inner Regional	203	Principal referral
VIC	Latrobe Regional Hospital [Traralgon]	Inner Regional	240	Principal referral
VIC	Albury Wodonga Health - Albury Campus	Inner Regional	120	Large regional
VIC	Albury Wodonga Health - Wodonga Campus	Inner Regional	111	Large regional
VIC	Central Gippsland Health Service [Sale]	Inner Regional	81	Large regional
VIC	Northeast Health Wangaratta	Inner Regional	142	Large regional
VIC	South West Healthcare [Warrnambool]	Inner Regional	167	Large regional
VIC	West Gippsland Healthcare Group [Warragul]	Inner Regional	91	Large regional
VIC	Bairnsdale Regional Health Service	Outer Regional	96	Large regional
VIC	Mildura Base Hospital	Outer Regional	128	Large regional
VIC	Wimmera Base Hospital [Horsham]	Outer Regional	81	Large regional
VIC	Bass Coast Regional Health	Inner Regional	51	Medium
VIC	Benalla & District Memorial Hospital	Inner Regional	57	Medium
VIC	Castlemaine Health	Inner Regional	55	Medium
VIC	Colac Area Health	Inner Regional	37	Medium
VIC	Djerriwarrh Health Service [Bacchus Marsh]	Inner Regional	45	Medium
VIC	East Grampians Health Service [Ararat]	Inner Regional	43	Medium
VIC	Echuca Regional Health	Inner Regional	65	Medium
VIC	Kyabram & District Health Service	Inner Regional	46	Medium
VIC	Leongatha Memorial Hospital	Inner Regional	37	Medium
VIC	Maryborough District Health Service	Inner Regional	43	Medium
VIC	Stawell Regional Health	Inner Regional	36	Medium
VIC	Western District Health Service [Hamilton]	Inner Regional	68	Medium
VIC	Swan Hill District Health [Swan Hill]	Outer Regional	39	Medium

<b>State</b>	<b>Hospital Name</b>	<b>Remoteness Area</b>	<b>Available Beds</b>	<b>2011-12 Peer Group</b>
VIC	Alexandra District Hospital	Inner Regional	31	Small
VIC	Beechworth Health Service	Inner Regional	13	Small
VIC	Cobram District Hospital	Inner Regional	18	Small
VIC	Daylesford District Hospital	Inner Regional	21	Small
VIC	Heathcote Health	Inner Regional	9	Small
VIC	Kilmore & District Hospital	Inner Regional	28	Small
VIC	Korumburra Hospital	Inner Regional	15	Small
VIC	Kyneton District Health Service	Inner Regional	18	Small
VIC	Moyne Health Services [Port Fairy]	Inner Regional	15	Small
VIC	Rochester & Elmore District Health Service	Inner Regional	12	Small
VIC	Seymour District Memorial Hospital	Inner Regional	30	Small
VIC	South Gippsland Hospital [Foster]	Inner Regional	16	Small
VIC	South West Healthcare [Camperdown]	Inner Regional	25	Small
VIC	Terang & Mortlake Health Service [Terang]	Inner Regional	26	Small
VIC	Yarram & District Health Service	Inner Regional	22	Small
VIC	Yarrawonga Health	Inner Regional	29	Small
VIC	Cohuna District Hospital	Outer Regional	16	Small
VIC	East Wimmera Health Service [Donald]	Outer Regional	15	Small
VIC	East Wimmera Health Service [St Arnaud]	Outer Regional	16	Small
VIC	Edenhope & District Hospital	Outer Regional	18	Small
VIC	Kerang District Health	Outer Regional	24	Small
VIC	Mansfield District Hospital	Outer Regional	24	Small
VIC	Rural Northwest Health [Warracknabeal]	Outer Regional	15	Small
VIC	West Wimmera Health Service [Nhill]	Outer Regional	24	Small

## Appendix F

### ASAR Accredited Qualifications

Conferring Body	ASAR Accredited Qualifications
	Diploma of Medical Ultrasonography (Cardiac) Diploma of Medical Ultrasonography (Obstetric) Diploma of Medical Ultrasonography (Vascular) Diploma in Medical Ultrasonography (General) expired 16/4/2016
The Australasian Society for Ultrasound in Medicare (ASUM)	<b>Please note - The Australasian Society for Ultrasound in Medicare (ASUM) decided to withdraw their Graduate Diploma in Medical Ultrasound (GDMU) courses listed below effective 24 July 2018.</b> Graduate Diploma in Medical Ultrasonography (General) Graduate Diploma in Medical Ultrasonography (Vascular) Graduate Diploma in Medical Ultrasonography (Obstetric) Graduate Diploma in Medical Ultrasonography (Cardiac)  Post Graduate Diploma in Medical Imaging Science — Ultrasound (for students enrolled prior to 1/1/2000)
Curtin University of Technology	Master of Medical Sonography, incorporating the Graduate Diploma (both the Master of Medical Sonography and the Graduate Diploma are accredited) Expired Feb 2016
Monash University	Master of Medical Radiations (Medical Ultrasound)  Master of Applied Science (Medical Ultrasound)-course not offered beyond 2012
Queensland University of Technology	Graduate Certificate in Applied Science (Breast Ultrasound)-course not offered beyond 2012 Master of Cardiac Ultrasound- course not offered beyond 2012
RMIT University	Graduate Diploma (Sonography) Graduate Diploma of Ultrasonography Master of Applied Science (Sonography)

University of South Australia	Graduate Certificate in Medical Radiation (Breast Imaging)-prior to 2009  Graduate Diploma of Health Science (Medical Sonography) Graduate Diploma of Health Science (Vascular Sonography)
University of Sydney Cumberland Campus	Graduate Diploma of Health Science with Certificates of Specialisation in Cardiac Sonography (for students enrolled prior to 31/3/2006 and students enrolled after 8/3/2009) Master of Health Science (Medical Sonography)
<b>Note: These programs will not be offered beyond 2010.</b>	Master of Health Science with Certificates of Specialisation in Cardiac and Vascular Sonography (for students enrolled prior to 31/3/2006 and students enrolled after 8/3/2009) Master of Health Science (Medical Ultrasound)  Diploma of Medical Ultrasonography (Cardiac) Diploma of Medical Ultrasonography (Obstetric) Diploma of Medical Ultrasonography (Vascular) Diploma in Medical Ultrasonography (General) expired 16/4/2016
The Australasian Society for Ultrasound in Medicare (ASUM)	<b>Please note - The Australasian Society for Ultrasound in Medicare (ASUM) decided to withdraw their Graduate Diploma in Medical Ultrasound (GDMU) courses listed below effective 24 July 2018.</b> Graduate Diploma in Medical Ultrasonography (General) Graduate Diploma in Medical Ultrasonography (Vascular) Graduate Diploma in Medical Ultrasonography (Obstetric) Graduate Diploma in Medical Ultrasonography (Cardiac)

*Note:* ASAR (2022) [asar.com.au/resources/previous-asar-accredited-courses](http://asar.com.au/resources/previous-asar-accredited-courses)

**Appendix G**

**ASAR CPD Activities, Credit & Documentation**

Type	Code	Activity	CPD Credits	Documentation
1. Attendance	1A	Attendance at national/state/international meetings workplace mini-conferences, scanning workshops and webinars	1 per hour of educational activity	Certificate of attendance or receipt of registration & copy of program
	1B	Attendance at grand rounds, in-house seminars and workplace training (e.g. CPR, OHS)	1 per hour of educational activity to a maximum of 25 credits per triennium	Certificate of attendance or CPD Learning Activity Record ( <a href="https://asar.com.au/forms">https://asar.com.au/forms</a> )
2. Publishing / Presenting	2A	Scientific or professional publication	50 (Peer reviewed, principal author*) 30 (Peer reviewed, non-principal author) 25 (Non-peer reviewed, principal author*) 15 (Non-peer reviewed, non-principal author)	Copy of published article including journal name, date and page numbers
	2B	Conference presentations (oral or poster) at state, national or international meetings	40 (Oral presentations where individual presenting work claims CPD credit) 25 (Poster presentation by principal author*) 5 (Poster presentation by non- principal author) 25 (Live-scanning workshop) 15 (Case Study)	Meeting program documenting name of presenter and topic presented or Letter of acknowledgement/thanks or certificate
	2C	A presentation within your workplace or local area (including professional association branch meetings)	15 (Oral presentation where individual presenting work claims CPD credit) 10 (Live-scanning/case study)	Brochure documenting name of presenter and topic presented or Letter of acknowledgement/thanks or certificate
3. Educational	3A	Self-directed learning to enhance patient outcomes and professional skills e.g. research, reading relevant journal articles or texts, journal club,	1 per hour to a maximum of 40 per triennium	CPD Learning Activity Record ( <a href="https://asar.com.au/forms">https://asar.com.au/forms</a> )

		web-based activities other than webinars		
	3B	Peer review of a journal article for a scientific or publication	1 point per hour to a maximum of 5 per article	A thank you letter or certificate from the publisher
	3C	Enrolment in an Ultrasound or related Medical Post Graduate course, PhD provided by an Australasian Registered Training Organisation (RTO) or University.	40 per subject	Copy of university transcript or letter of enrolment
	3D	Completion of Management, Leadership course or Certificate IV in Training and Assessment	1 per hour to a maximum of 30 credits per triennium with a cap of 15 credits per activity.	Certificate of completion
	3E	Preceptorships - attendance onsite	2 per day to a maximum of 15 credits per triennium	Signed letter from individual providing the education outlining duration and purpose of the preceptorship
4. Other	4	Any other documented educational or professional activity e.g. participation in relevant professional committee meeting, clinical program, course or national conference convening, adjudicating or chairing conference sessions, examining within the profession, formalised mentoring. (see FAQ's for clarification)	1 per hour to a maximum of 30 credits per triennium with a cap of 15 per activity	Letter or certificate of acknowledgement or thanks, or CPD Learning Activity Record ( <a href="https://asar.com.au/forms">https://asar.com.au/forms</a> )
5. CPD Audit	5	CPD Audit Certificate	60 per triennium	Certificate/letter from ASA, ASMIRT or ASUM confirming successful completion of CPD program obligations for the most recent triennium

\* Principal author is the \*first named author on the published paper.

Note: ASAR (2022). Australian Sonographer Accreditation Registry CPD Program. Retrieved from [asar.com.au/cpd/asarcpdprogram](https://asar.com.au/cpd/asarcpdprogram)

## Appendix H

### *Interview Invitation email / Managers*

[date]

[full name]

[full job title]

[organisation name]

Dear [given name]

You may be aware that your hospital has agreed to participate in a research project entitled *Continuing Professional Development of Allied Health Professionals: A Regional Study*. The project is being undertaken as part of my PhD studies, under the supervision of Dr Jacqueline Tuck and Dr Helen Weadon at Federation University Australia. The research will explore the continuing professional development (CPD) of allied health professionals (Radiographers, Sonographers and Physiotherapists) in regional hospitals.

The first stage of the project involves interviews with allied health managers and senior hospital managers with responsibility for human resource development and knowledge management. Thus, I am writing to invite you to participate in an interview which would take about an hour of your time. The purpose of the interview is to explore how hospital policies and management practices influence professional knowledge and expertise in allied health.

Please find attached a participant information sheet, which tells you about the project and explains the processes involved if you decide to participate. If you require further information or clarification of any aspects of the project, I would be more than happy to discuss the project with you.

I thank you for your consideration of this research. Please confirm if you are willing to participate by return e-mail and I will then contact you to schedule an interview at your convenience.

Yours Sincerely

**Peter Schenk**

PhD Student | Federation Business School  
Federation University | Building B | Mt Helen Campus  
PO Box 663 Ballarat Vic 3353  
email: [pj.schenk@federation.edu.au](mailto:pj.schenk@federation.edu.au)



## Appendix I

### *Invitation Presentation Script / Allied Health*

#### **Introduction & Experience**

My name is Peter Schenk and I am a PhD student from Federation University Australia. I also have many years of experience working as a radiographer and sonographer in regional Victorian hospitals.

**Your hospital has agreed** to participate in this research project which forms part of my PhD studies. The project is entitled *Continuing Professional Development of Allied health Professionals: A Regional Study*.

**The research will explore** the continuing professional development (CPD) of allied health professionals, looking at the **professions of Radiography, Sonography and Physiotherapy**; and the influence of working in regional Victorian public hospitals on professional development.

**I have distributed a brief questionnaire** asking about your work history and experience. The questionnaire is anonymous and I would ask you to fill this in if you are willing to do so. I have also distributed **Participant Information sheets** which detail your involvement if you decide to participate in an interview.

**Personal one-on-one conversational interviews** will be used to collect information for the research and these are planned to take between **45 and 60 minutes**. The interview will be conducted at your workplace in a private setting. While I cannot promise that you will receive direct benefit from this research; your one hour of interview time **may count towards your own CPD** as reflective practice.

**The findings of the research may be useful to you and others** in similar situations, with potential benefits for regional hospitals and community healthcare. One aim of the project is to provide **practical recommendations to improve the effectiveness of professional development** from both an allied health professional and hospital perspective.

**My research would benefit greatly from your participation.** If you are willing to participate in an interview as part of this research, **I would ask that you fill in your details** at the bottom of the questionnaire. The questionnaire and invitation will be collected at the conclusion of this meeting.

**If you have any questions** on any aspect of the project, I would be more than happy to answer these.

- **Answer any questions.**

**Thank you for considering your participation** in this research.

**If you have agreed** to be interviewed, **I will contact you within the next few weeks** to organise a convenient time.

**Thank you** for your time **and goodbye**. Collect questionnaires and invitations.

**Appendix J**

**Questionnaire Invitation / Allied Health**

**CPD of Allied Health Professionals: A Regional Study**

Please complete your details below.

1. Your Allied health profession? \_\_\_\_\_
2. What is your specialisation, if applicable? \_\_\_\_\_
3. Age (please circle)    20-29                      30-39                      40-49                      50-59                      60+
4. Number of years of qualified practice? \_\_\_\_\_
5. How many years worked at this hospital? \_\_\_\_\_
6. Have you worked at other hospitals? \_\_\_\_\_
7. If yes, where? \_\_\_\_\_  
\_\_\_\_\_
8. Do you work full-time or part-time? \_\_\_\_\_
9. If part-time, how many hours per week? \_\_\_\_\_

If you are willing to participate in an interview, please complete and provide your details below.

I am willing to participate in an interview

10. Name \_\_\_\_\_

11. Phone: (B/H) \_\_\_\_\_ (Mobile) \_\_\_\_\_

e-mail: \_\_\_\_\_

Completed questionnaires may be returned either at the end of the presentation or emailed to Peter Schenk – [pj.schenk@federation.edu.au](mailto:pj.schenk@federation.edu.au). Please note: in the case that there are too many potential participants, then the required number of participants will be randomly selected. The researcher will contact you within a few weeks to let you know if you have been selected or not; and if so, to schedule an interview at your convenience.

If you have any questions, or you would like further information regarding the project titled **CPD of Allied health Professionals: A Regional Study**, please contact the Coordinating Principal Researcher, **Dr Jacqueline Tuck** of the **Federation Business School, Federation University Australia**. Phone: 03 5327 9889 e-mail: [j.tuck@federation.edu.au](mailto:j.tuck@federation.edu.au)

## Appendix K

### *Interview Schedule / Hospital Manager*

#### **Continuing Professional Development (CPD) of Allied Health Professionals: A Regional Study**

Interviewer: Peter Schenk - Introduce myself and the research project

Interviewee – Name: \_\_\_\_\_

- Project Description (Hospital Manager PLIS)
- Any questions?
- Consent Form – signed by both parties

Thank you for agreeing to be in this project. I am very interested in your thoughts today.

#### **Introduction:**

1. Could you give me a brief background of your career and management experience?

#### **CPD – holistic understanding:**

2. Related to allied health professionals; what does Continuing Professional Development (CPD) mean to you?
3. What are the main reasons that you expect allied health professionals to undertake CPD activities?
4. Who do you feel is responsible for professional development (PD)?

#### **CPD – planning:**

5. Does this hospital play a part in the CPD activities that allied health professionals undertake; and if so, can you explain how?
6. Could you tell me about the support provided by this hospital for allied health professionals' involvement in CPD?

#### **Reflective Practice:**

7. Are opportunities provided for your allied health professionals to reflect on their practice?

#### **KM:**

8. Can you tell me how procedures and protocols are developed in this hospital?
9. Does the hospital have policies that determine how 'best-practice' knowledge is shared in the organisation when identified by professional staff?

#### **Professional Expertise**

10. Does this hospital have any internal programs; or are they involved in any external programs aimed at improving the expertise of allied health professionals?

#### **Competencies:**

11. What do you consider are the most important skills and knowledge required for allied health professionals?

#### **Concluding Question:**

12. Do you have anything else to add to our discussion about allied health professionals' CPD?

## Appendix L

### *Interview Schedule / Allied Health Manager*

#### **Continuing Professional Development (CPD) of Allied Health Professionals: A Regional Study**

Interviewer: Peter Schenk - Introduce myself and the research project

Interviewee – Name: \_\_\_\_\_

- Participant Information (Allied health & Hospital Managers)
- Any questions?
- Consent Form – signed by both parties

#### **Introduction:**

1. Could you give me a brief background of your career and management experience?

#### **CPD – holistic understanding:**

2. Related to allied health professionals; what does Continuing Professional Development (CPD) mean to you?
3. What are the main reasons that you expect allied health professionals to undertake CPD activities?
4. Do you think the CPD of allied health professionals enhances their evidence-based practice?
5. Who do you feel is responsible for professional development (PD)?

#### **CPD – planning:**

6. Do you play a part in the types of CPD activities allied health professionals undertake?
7. Are there ways you support allied health professionals' involvement in PD?

#### **Reflective Practice:**

8. Are opportunities provided within this department for reflective practice?

#### **Knowledge Management:**

9. Can you tell me how procedures and protocols are developed for your department?
10. If something 'best-practice' or cutting edge is identified by staff how is their new knowledge managed at the department level?

#### **Professional Expertise:**

11. What opportunities do you provide for a variety of experiences in allied health professionals' day-to-day work?

#### **Competencies:**

12. What do you consider are the most important skills and knowledge required for allied health professionals' work?

#### **Concluding Question:**

13. Do you have anything else to add to our discussion about allied health professionals' CPD?

## Appendix M

### *Interview Schedule / Allied Health Professional*

#### **Continuing Professional Development (CPD) of Allied Health Professionals: A Regional Study**

Interviewer: Peter Schenk - Introduce myself and the research project

Interviewee – Name: \_\_\_\_\_

- Project Description (Allied health Professionals PLIS)
- Any questions?
- Consent Form – signed by both parties

#### **Introduction:**

1. Could you give me a brief rundown of your career experiences?

#### **CPD – holistic understanding:**

2. What does Continuing Professional Development (CPD) mean to you and what motivates you to undertake CPD?
3. Can you give me some examples of the CPD activities you have participated in over the last year?
4. Do your CPD activities contribute to your professional practice?
5. Who do you feel is responsible for *professional development* (PD)?

#### **CPD – planning:**

6. Could you tell me how you decide on the activities which you include in your PD?
7. Can you give me some examples of how working in this hospital affects the PD activities you undertake?

#### **Reflective Practice:**

8. What has prompted you in the past to want to learn more for your work?

#### **Knowledge Management:**

9. Could you explain how you go about finding knowledge you need to do your work?
10. If you or your colleagues find something new that is 'best practice' or cutting edge, is that new knowledge shared among other work colleagues?

#### **Professional Expertise:**

11. What opportunities are provided for variety of experiences in your day-to-day work?

#### **Competencies:**

12. What do you believe are the most important skills and knowledge required for your work?

#### **Concluding Question:**

13. Do you have anything else to add to our discussion about PD?

## Appendix N

### Research Governance Approvals Letter

[Date]

Federation University Australia  
Federation Business School (Ballarat)  
Attention: Dr Jacqueline Tuck  
PO Box 663  
Ballarat VIC 3353

Dear Jacqueline,

Research governance authorisation for research project entitled:  
**Continuing Professional Development of Allied health Professionals: A Regional Study**

Coordinating Principal investigator: Dr Jacqueline Tuck

**HREC Reference Number: HREC/16/Austin/483**

**HREC approval date January 23<sup>rd</sup>, 2017**

I am pleased to advise that the above project approved by Austin Health HREC on January 23<sup>rd</sup>, 2017 satisfies [hospital name] research governance requirements, and the research may now begin. Conduct of the project is subject to compliance with the conditions set out below and any additional conditions specified by Austin Health HREC as the reviewing HREC.

#### Documents specific to this authorisation:

Document	Version	Date
Austin Health HREC – Ethical Approval letter		23 January 2017
LNR Vic (AU/13/C63B29)		18 January 2017
Project Description/Protocol	2	12 January 2017
Questionnaire Invitation/ Allied Health	2	12 January 2017
Interview Invitation Email/ Managers	1	17 November 2016
Interview Schedule/ Hospital Manager	1	17 November 2016
Interview Schedule/ Allied Health Manager	1	17 November 2016
Interview Schedule/ Allied Health Professional	1	17 November 2016
Invitation Presentation Script/ Allied Health	1	18 November 2016
Master PICF/ Managers	3	19 January 2017
Master PICF/ Allied Health	3	19 January 2017

#### Conditions of authorisation:

In order to comply with the National Statement on Ethical Conduct in Human Research (NHMRC, 2007), Australian Code for the Responsible Conduct of Research and local research policies and guidelines, you are required to notify the West Wimmera Health Service research governance contact (named below) of:

- the start date of the project at West Wimmera Health Service ;
- any amendments to the project after having been approved by the reviewing HREC;
- any unexpected developments in the project with ethical implications;
- your inability to continue as principal investigator and any other change in research personnel involved in the project at West Wimmera Health Service;

- any proposed extension to the duration of the project, past the HREC approval date stated above; and
- any decision taken to end the project prior to the expected date of completion or to withdraw West Wimmera Health Service as a site participating in the project.

**Research governance contact:**

Name	[Name]
Position	[Position]
Phone	[Phone]
email	[email address]

You are also required to submit to the Research Governance Officer:

- an annual progress report for the duration of the project on the anniversary of the HREC approval;
- a comprehensive final report upon completion of the project.

Yours sincerely,

[name]

Chief Executive Officer

## Appendix O

### Framework of Analysis / Manager Questions

Research Questions	Themes & Sub-themes	Manager Interview Questions
<b>Introduction</b>	<ul style="list-style-type: none"> <li>• Scope of practice</li> </ul>	<ol style="list-style-type: none"> <li>1. Could you give me a brief background of your career and management experience?</li> </ol>
<b>CPD – holistic understanding</b> What understandings of CPD are held by managers and allied health professionals in regional Victorian public hospitals?	<ul style="list-style-type: none"> <li>• overall conception of CPD processes</li> <li>• implied social responsibility for CPD</li> <li>• CPD motivations               <ul style="list-style-type: none"> <li>○ professional registration - mandatory requirements</li> <li>○ hospital accreditation</li> <li>○ evidence-based practice</li> <li>○ professional advancement</li> <li>○ domain specialist status</li> <li>○ personal development</li> </ul> </li> <li>• influence of autonomy on motivation (influence of medicine)</li> </ul>	<ol style="list-style-type: none"> <li>2. Related to allied health professionals; what does continuing professional development (CPD) mean to you?</li> <li>3. What are the main reasons that you expect allied health professionals to undertake CPD activities?</li> <li>4. Who do you feel is responsible for professional development (PD)?</li> </ol>
<b>CPD – planning</b> What factors influence the planning of CPD programs undertaken by allied health professionals in regional Victorian public hospitals?	<ul style="list-style-type: none"> <li>• Face-to-face preferred</li> <li>• contribution of mandatory and discretionary</li> <li>• formal and informal (mix)</li> <li>• local availability</li> <li>• regional barriers and constraints (travel, costs, scarcity of locums, negative personal attitudes, scheduling problems, lack of relevant activities, lack of information and/or red tape)</li> <li>• online learning (webinars, distance education, social media)</li> </ul>	<ol style="list-style-type: none"> <li>5. Does this hospital play a part in the PD activities that allied health professionals undertake; and if so, can you explain how?</li> <li>6. Could you tell me about the support provided by this hospital for allied health professionals' involvement in PD?</li> </ol>
<b>Reflective Practice</b>	<ul style="list-style-type: none"> <li>• Identifying gaps in knowledge</li> <li>• reactive or proactive</li> <li>• strategic use of CPD</li> </ul>	<ol style="list-style-type: none"> <li>7. Are opportunities provided for your allied health professionals to reflect on their practice?</li> </ol>
<b>Knowledge Management (KM)</b> How does the choice between either a personal, organisational or hybrid approach to KM in regional	<ul style="list-style-type: none"> <li>• Knowledge required by organisation?</li> <li>• personal or organisational knowledge approach; or hybrid combination</li> </ul>	<ol style="list-style-type: none"> <li>8. Can you tell me how procedures and protocols are developed in this hospital?</li> </ol>



<p>Victorian public hospitals impact the CPD undertaken by allied health professionals?</p>	<ul style="list-style-type: none"> <li>• personal knowledge approach (reflective practice, sharing, learning and trust) <ul style="list-style-type: none"> <li>○ social interrelationships among employees</li> <li>○ knowledge seeking behaviour</li> <li>○ knowledge sharing behaviour - allowing those with less expertise to learn from those with more</li> </ul> </li> <li>• organisational knowledge approach (formal processes)</li> </ul>	<p>9. Does the hospital have policies that determine how 'best-practice' knowledge is shared in the organisation when identified by professional staff?</p>
<p><b>Professional Expertise</b> How does working in regional Victorian public hospitals affect allied health professionals' knowledge and expertise?</p>	<ul style="list-style-type: none"> <li>• human resource development (HRD)</li> <li>• staff explicit knowledge needs</li> <li>• staff tacit knowledge needs <ul style="list-style-type: none"> <li>○ basic tacit knowledge (routine learning) &amp;</li> <li>○ complex tacit knowledge (expert &amp; intuitive learning)</li> <li>○ professional expertise – novice to expert</li> <li>○ explicit and tacit learning versus professional expertise</li> </ul> </li> <li>• informal on-the-job learning <ul style="list-style-type: none"> <li>○ work structure (challenging practice &amp; collaboration)</li> <li>○ advanced practitioner roles &amp; availability in regional practice</li> </ul> </li> <li>• peer support <ul style="list-style-type: none"> <li>○ professional isolation</li> <li>○ community of practice (CoP) and online CoPs (ICT in regional settings)</li> <li>○ programs that make connections - personal networks</li> <li>○ inter-professional cooperation</li> </ul> </li> </ul>	<p>10. Does this hospital have any internal programs; or are they involved in any external programs aimed at improving the expertise of allied health professionals?</p>
<p><b>Competencies</b> Which competencies do hospital managers and allied health professionals consider necessary for good practice?</p>	<ul style="list-style-type: none"> <li>• patient care</li> <li>• knowledge for practice</li> <li>• practice-based learning and improvement</li> <li>• interpersonal and communication skills</li> <li>• professionalism</li> <li>• systems-based practice</li> <li>• inter-professional collaboration</li> <li>• personal and professional development</li> </ul>	<p>11. What do you consider are the most important skills and knowledge required for allied health professionals?</p> <p>12. Do you have anything else to add to our discussion about allied health professionals' PD?</p>

## Appendix P

### Framework of Analysis / Allied Health Manager Questions

Research Questions	Themes & Sub-themes	Allied health Manager Interview Questions
<b>Introduction</b>	<ul style="list-style-type: none"> <li>• Scope of practice</li> </ul>	1. Could you give me a brief background of your career and management experience so far?
<b>CPD – holistic understanding</b> What understandings of CPD are held by managers and allied health professionals in regional Victorian public hospitals?	<ul style="list-style-type: none"> <li>• overall conception of CPD processes</li> <li>• implied social responsibility for CPD</li> <li>• CPD motivations               <ul style="list-style-type: none"> <li>○ professional registration - mandatory requirements</li> <li>○ hospital accreditation</li> <li>○ evidence-based practice</li> <li>○ professional advancement</li> <li>○ domain specialist status</li> <li>○ personal development</li> </ul> </li> <li>• influence of autonomy on motivation (influence of medicine)</li> </ul>	2. What does Continuing Professional Development (CPD) mean to you?  3. What are the main reasons this department expects allied health professionals to undertake CPD activities?
<b>CPD – Planning</b> What factors influence the planning of CPD programs undertaken by allied health professionals in regional Victorian public hospitals?	<ul style="list-style-type: none"> <li>• Face-to-face preferred</li> <li>• contribution of mandatory and discretionary</li> <li>• formal and informal (mix)</li> <li>• local availability</li> <li>• regional barriers and constraints (travel, costs, scarcity of locums, negative personal attitudes, scheduling problems, lack of relevant activities, lack of information and/or red tape)</li> <li>• online learning (webinars, distance education, social media)</li> </ul>	4. Does this department play any part in the types of CPD activities allied health professionals undertake?  5. Are there ways this department supports allied health professionals' involvement in CPD?
<b>Reflective Practice</b>	<ul style="list-style-type: none"> <li>• Identifying gaps in knowledge</li> <li>• reactive or proactive</li> <li>• strategic use of CPD</li> </ul>	6. What opportunities does this department provide for reflective practice?
<b>Knowledge Management (KM)</b> How does the choice between either a personal, organisational or hybrid approach to KM in regional Victorian public hospitals impact	<ul style="list-style-type: none"> <li>• Knowledge required by organisation?</li> <li>• personal or organisational knowledge approach; or hybrid combination</li> <li>• personal knowledge approach (reflective practice, sharing &amp; trust)</li> </ul>	7. Can you tell me how procedures and protocols are developed for your department?  8. If something 'best-practice' or cutting edge is identified by staff how is their new knowledge managed at the department level?

the CPD undertaken by allied health professionals?	<ul style="list-style-type: none"> <li>○ social interrelationships among employees</li> <li>○ knowledge-seeking behaviour</li> <li>○ knowledge sharing behaviour - allowing those with less expertise to learn from those with more</li> <li>● organisational knowledge approach (formal processes)</li> </ul>	
<b>Professional Expertise</b> How does working in regional Victorian public hospitals affect allied health professionals' knowledge and expertise?	<ul style="list-style-type: none"> <li>● human resource development (HRD)</li> <li>● staff explicit knowledge needs</li> <li>● staff tacit knowledge needs             <ul style="list-style-type: none"> <li>○ basic tacit knowledge (routine learning) &amp;</li> <li>○ complex tacit knowledge (expert &amp; intuitive learning)</li> <li>○ professional expertise – novice to expert</li> <li>○ explicit and tacit learning versus professional expertise</li> </ul> </li> <li>● informal on-the-job learning             <ul style="list-style-type: none"> <li>○ work structure (challenging practice and collaboration with experts)</li> <li>○ advanced practitioner roles &amp; availability in regional practice</li> </ul> </li> <li>● peer support             <ul style="list-style-type: none"> <li>○ professional isolation</li> <li>○ community of practice (CoP) and online CoPs (ICT in regional settings)</li> <li>○ programs that make connections - personal knowledge networks</li> <li>○ inter-professional cooperation</li> </ul> </li> </ul>	9. What opportunities does this department provide for a range of experience in allied health professionals day-to-day work?
<b>Competencies</b> Which competencies do hospital managers and allied health professionals consider necessary for good practice?	<ul style="list-style-type: none"> <li>● patient care</li> <li>● knowledge for practice</li> <li>● practice-based learning and improvement</li> <li>● interpersonal and communication skills</li> <li>● professionalism</li> <li>● systems-based practice</li> <li>● inter-professional collaboration</li> <li>● personal and professional development</li> </ul>	10. What do you believe are the most important skills and knowledge required for allied health professionals' work?

## Appendix Q

### Framework of Analysis / Allied Health Professionals Questions

Research Questions	Themes & Sub-themes	Allied Health Professionals Interview Questions
<b>Introduction</b>	<ul style="list-style-type: none"> <li>• Scope of practice</li> </ul>	1. Could you give me a brief rundown of your career experiences?
<b>CPD – holistic understanding</b> What understandings of CPD are held by managers and allied health professionals in regional Victorian public hospitals?	<ul style="list-style-type: none"> <li>• overall conception of CPD processes</li> <li>• implied social responsibility for CPD</li> <li>• CPD motivations               <ul style="list-style-type: none"> <li>○ professional registration - mandatory requirements</li> <li>○ hospital accreditation</li> <li>○ evidence-based practice</li> <li>○ professional advancement</li> <li>○ domain specialist status</li> <li>○ personal development</li> </ul> </li> <li>• influence of autonomy on motivation (influence of medicine)</li> </ul>	2. What does continuing professional development (CPD) mean to you?  3. Can you give me some examples of the CPD activities you have participated in over the last year?
<b>CPD – Planning</b> What factors influence the planning of CPD programs undertaken by allied health professionals in regional Victorian public hospitals?	<ul style="list-style-type: none"> <li>• Face-to-face preferred</li> <li>• contribution of mandatory and discretionary</li> <li>• formal and informal (mix)</li> <li>• local availability</li> <li>• regional barriers and constraints (travel, costs, scarcity of locums, negative personal attitudes, scheduling problems, lack of relevant activities, lack of information and/or red tape)</li> <li>• online learning (webinars, distance - education, social media)</li> </ul>	4. Could you tell me how you decide on the activities which you include in your CPD?  5. Can you give me some examples of how working in this hospital affects the CPD activities you undertake?
<b>Reflective Practice</b>	<ul style="list-style-type: none"> <li>• Identifying gaps in knowledge</li> <li>• reactive or proactive</li> <li>• strategic use of CPD</li> </ul>	6. What has prompted you in the past to want to learn more for your work?
<b>Knowledge Management (KM)</b> How does the choice between either a personal, organisational or hybrid approach to KM in regional Victorian public hospitals impact the CPD undertaken by allied health professionals?	<ul style="list-style-type: none"> <li>• Knowledge required by organisation?</li> <li>• personal or organisational knowledge approach; or hybrid combination</li> <li>• personal knowledge approach (reflective practice, sharing, &amp; trust)               <ul style="list-style-type: none"> <li>○ social interrelationships among employees</li> <li>○ knowledge-seeking behaviour</li> <li>○ knowledge sharing behaviour - allowing those with less expertise to learn from those with more</li> </ul> </li> <li>• organisational knowledge approach (formal processes)</li> </ul>	7. Could you explain how you go about finding knowledge you need to do your work?  8. If you find something new that is 'best practice' or cutting edge, do you share that knowledge with your work colleagues?

<p><b>Professional Expertise</b></p> <p>How does working in regional Victorian public hospitals affect allied health professionals' knowledge and expertise?</p>	<ul style="list-style-type: none"> <li>• human resource development</li> <li>• staff explicit knowledge needs</li> <li>• staff tacit knowledge needs <ul style="list-style-type: none"> <li>○ basic tacit knowledge (routine learning) &amp;</li> <li>○ complex tacit knowledge (expert &amp; intuitive learning)</li> <li>○ professional expertise – novice to expert</li> <li>○ explicit and tacit learning versus professional expertise</li> </ul> </li> <li>• informal on-the-job learning <ul style="list-style-type: none"> <li>○ work structure (challenging practice and collaboration)</li> <li>○ advanced practitioner roles &amp; availability in regional practice</li> </ul> </li> <li>• peer support <ul style="list-style-type: none"> <li>○ professional isolation</li> <li>○ community of practice (CoP) and online CoPs (ICT in regional settings)</li> <li>○ programs that make connections - personal knowledge networks</li> <li>○ inter-professional cooperation</li> </ul> </li> </ul>	<p>9. What opportunities for different experiences does this hospital provide in your day-to-day work?</p>
<p><b>Competencies</b></p> <p>Which competencies do hospital managers and allied health professionals consider necessary for good practice?</p>	<ul style="list-style-type: none"> <li>• patient care</li> <li>• knowledge for practice</li> <li>• practice-based learning and improvement</li> <li>• interpersonal and communication skills</li> <li>• professionalism</li> <li>• systems-based practice</li> <li>• inter-professional collaboration</li> <li>• personal and professional development</li> </ul>	<p>10. What do you believe are the most important skills and knowledge required for your work?</p>