



July 2022

Development of a Digital Health Capability Framework for Allied Health Practitioners: An Australian First

Nikki Littlewood

Austin Health, Victoria, nikki.littlewood@wh.org.au

Sharon Downie

Department of Health, Victoria, sharon.downie@rch.org.au

Abbey Sawyer

University of Melbourne, abbey.sawyer@live.com.au

Kath Feely

Royal Melbourne Hospital, kath.feely@mh.org.au

Dhruv Govil

South Gippsland Coast Partnership, Victoria, dhruv.govil@basscoasthealth.org.au

See next page for additional authors

Follow this and additional works at: <https://nsuworks.nova.edu/ijahsp>



Part of the [Health Services Research Commons](#)

Recommended Citation

Littlewood N, Downie S, Sawyer A, Feely K, Govil D, Gordon B. Development of a Digital Health Capability Framework for Allied Health Practitioners: An Australian First. *The Internet Journal of Allied Health Sciences and Practice*. 2022 Jul 05;20(3), Article 22.

This Case Study is brought to you for free and open access by the College of Health Care Sciences at NSUWorks. It has been accepted for inclusion in *Internet Journal of Allied Health Sciences and Practice* by an authorized editor of NSUWorks. For more information, please contact nsuworks@nova.edu.

Development of a Digital Health Capability Framework for Allied Health Practitioners: An Australian First

Abstract

Background: The value of digital health technologies and their contribution to high-quality and safe clinical care and enhanced health patient experience and outcomes is well established. Digital health technologies are increasingly being used by Victorian allied health professionals (AHPs) in routine service delivery, the uptake of which has been significantly accelerated by the impact of the coronavirus (COVID-19) pandemic. **Objectives:** This case study outlines the development of a capability framework to support Victorian AHPs, health services, other employers, and university training partners to measure and expand digital health capability at individual practitioner and workforce levels. **Methods:** A mixed-methods approach to the development of digital health and clinical informatics capabilities and the resultant framework is described, consisting of five phases: (i) a literature/scoping review to identify existing frameworks (ii) expert panel interviews, (iii) thematic analysis of interview themes, (iv) user testing and feedback and, (v) revision based on feedback. **Results:** This approach proved successful in managing key challenges that emerged during the project, as well as identifying potential barriers and enablers to longer term framework adoption, implementation, and maintenance. **Conclusion:** This study describes a mixed-methods approach to the development of an Australian-first, Allied health digital health capability framework to address knowledge and skills development at individual practitioner and workforce levels. This case study highlights the need for targeted education and training resources to support the health workforce to build capability in the application and use of digital health technologies. In developing a digital capability framework specific to the allied health workforce, the importance of stakeholder consultation in the early identification of barriers and enablers to potential uptake and implementation is also reinforced.

Author Bio(s)

1. Nikki Littlewood, BSc (Hons), MSc (Physiotherapy) - Project Lead, Austin Health, Victoria, Australia (nikki.littlewood@wh.org.au)
2. Sharon Downie, B.OT, MPH - Manager, Health Workforce Policy, Department of Health, Victoria Australia (sharon.downie@health.vic.gov.au)
3. Abbey Sawyer, BPhysio, PhD - Post-Doctoral Research Fellow, School of Health Science (Department of Physiotherapy), University of Melbourne, Victoria & Research Fellow, Institute for Breathing and Sleep, Austin Health (abbey.sawyer@unimelb.edu.au)
4. Kath Feely, BPhysio, MPH (Public Health), Grad Cert Health Informatics and Digital Health, Prof Cert Health Systems Management, Post Grad Cert Cardiorespiratory Physiotherapy - Chief Allied Health Information Officer, Royal Melbourne Hospital, Victoria Australia (kath.feely@mh.org.au)
5. Dhruv Govil, BSc, BPhysio - Project Lead, Better at Home Project, South Gippsland Coast Partnership, Victoria, Australia (dhruv.govil@basscoasthealth.org.au)
6. Brit Gordon, BPhysio, MBA- Chief Allied Health Officer, Austin Health, Victoria, Australia (brit.gordon@austin.org.au)

Acknowledgements

This project was fully funded by the Department of Health, Victoria, Australia.

Authors

Nikki Littlewood, Sharon Downie, Abbey Sawyer, Kath Feely, Dhruv Govil, and Brit Gordon

Development of a Digital Health Capability Framework for Allied Health Practitioners: An Australian First

Nikki Littlewood¹
Sharon Downie²
Abbey Sawyer^{1,3}
Kath Feely⁴
Dhruv Govil⁵
Brit Gordon¹

1. Austin Health, Victoria
2. Department of Health, Victoria
3. University of Melbourne, Victoria
4. Royal Melbourne Hospital, Victoria
5. South Gippsland Coast Partnership, Victoria

Australia

ABSTRACT

Background: The value of digital health technologies and their contribution to high-quality and safe clinical care and enhanced health patient experience and outcomes is well established. Digital health technologies are increasingly being used by Victorian allied health professionals (AHPs) in routine service delivery, the uptake of which has been significantly accelerated by the impact of the coronavirus (COVID-19) pandemic. **Objectives:** This case study outlines the development of a capability framework to support Victorian AHPs, health services, other employers, and university training partners to measure and expand digital health capability at individual practitioner and workforce levels. **Methods:** A mixed-methods approach to the development of digital health and clinical informatics capabilities and the resultant framework is described, consisting of five phases: (i) a literature/scoping review to identify existing frameworks (ii) expert panel interviews, (iii) thematic analysis of interview themes, (iv) user testing and feedback and, (v) revision based on feedback. **Results:** This approach proved successful in managing key challenges that emerged during the project, as well as identifying potential barriers and enablers to longer term framework adoption, implementation, and maintenance. **Conclusion:** This study describes a mixed-methods approach to the development of an Australian-first, Allied health digital health capability framework to address knowledge and skills development at individual practitioner and workforce levels. This case study highlights the need for targeted education and training resources to support the health workforce to build capability in the application and use of digital health technologies. In developing a digital capability framework specific to the allied health workforce, the importance of stakeholder consultation in the early identification of barriers and enablers to potential uptake and implementation is also reinforced.

Keywords: digital health; clinical informatics; allied health; mixed-methods; framework.

INTRODUCTION

'Digital health' is an umbrella term encompassing the application of 'clinical informatics' expertise to digital and wireless healthcare technologies including mobile applications, wearables, telehealth and electronic medical records.¹ 'Clinical informatics' specifically involves the collection, storage, retrieval and analysis of healthcare data to improve service quality and health outcomes.² Digital technologies are increasingly being used by allied health professionals (AHPs) for patient care and service delivery. The implementation and uptake of digital health has significantly accelerated because of the coronavirus (COVID-19) pandemic, and AHPs have rapidly adopted new technologies with varying levels of investment and support.

In 2021, the Victorian Department of Health (DH) released the *Digital Health Roadmap for Victoria*.³ Victoria is the second most populous state within Australia, with a population of over 6.64 million,⁴ with DH providing universal access to public health, medical services, and allied health services within the jurisdiction. This roadmap outlines a 5-year vision for Victorian public health services to increase digital maturity and identify workforce capability in digital health as a critical success factor. The *National Digital Health Strategy*⁵ also recognises that targeted support is critical to enable health workforces to confidently use digital technologies, including national educational curricula and training materials.

In 2020, as part of a broader capacity-building initiative, DH commissioned Austin Health to support the development of an allied health 'digital health' capability framework (the Framework) in partnership with the broader allied health sector. Austin Health is a public-funded health service located in north-eastern metropolitan Melbourne, offering acute, subacute, ambulatory care and several state-wide specialty services, and is a large employer of AHPs. The Framework aimed to define the knowledge, skills, and attributes that underpin safe and high-quality digital health practice for AHPs across all career levels, including those in specialist informatics roles, and to identify future workforce training requirements.

Professional development and lifelong learning are fundamental to AHP skill acquisition and growth. Digital health is increasingly a core component of service delivery, and AHPs must continue to build and develop these skills to ensure the provision of evidence-based, patient-centred care and efficient and effective service delivery in the digital age.⁶

Aim

This case study outlines the development of a capability framework to support Victorian AHPs, health services, other employers, and university training partners to measure and expand digital health capability at individual practitioner and workforce levels. The aim of this project was to identify and define a set of digital health and clinical informatics capabilities to support AHPs, health services, other employers, and university training partners to measure and expand their digital health capability.

METHODS

A mixed-methods approach was adopted to develop individual capabilities and an overall framework, with implementation occurring between June 2020 and March 2021.

Project Governance

An expert steering group provided project governance. Membership was drawn from academia, health policy and public health services in Victoria and also included the Manager, Allied Health Workforce, DH, and the co-chairs of the DH Allied Health Clinical Informatics Committee.

Informatics Advisory Group

Austin Health Quality Improvement Activity Approval (RiskmanQ #39937) was granted for this low-risk project. All participants were provided with written information outlining project aims, design, and expected outcomes. Voluntary participation in expert panel discussions, interviews, and user-acceptance testing was taken as informed consent for participation. This approach was structured as five discrete phases:

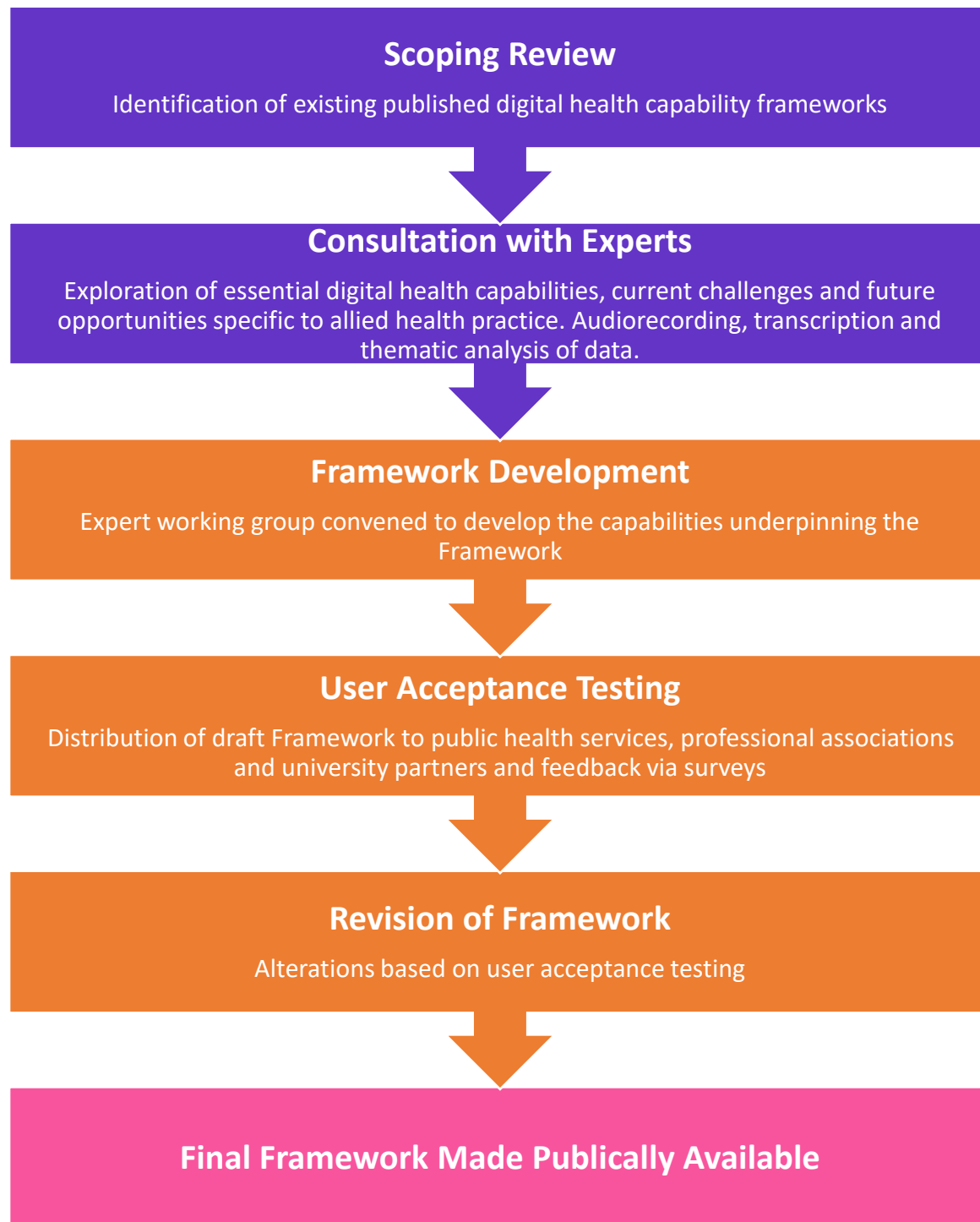


Figure 1. Phases of the mixed-methods approach to framework development

Phase 1: Scoping Review

A scoping review was undertaken by a single reviewer to identify existing published digital health capability frameworks. In order to ensure a comprehensive search of the literature, the following databases were searched for relevant articles: OVID Medline, Embase via OVID, PubMed databases and Google advance search. The databases were searched from creation until present day (December 2020) to ensure the historical context of the literature was obtained as well as ensuring more recent literature was found. Search terms are listed in Table 1. No filters were used owing to the paucity of literature in this area.

Table 1. Search terms for project Phase 1 – Scoping Review

Discipline Groups	Digital Health Terms	Topic Area Requirements
Allied health Art therapy Audiology Chiropractic Diagnostic imaging Dietetics Exercise physiology Hospital pharmacy Music therapy Nuclear medicine Occupational therapy Optometry Orthoptics Osteopathy Physiotherapy Podiatry Psychology Radiation oncology Radiotherapy Social work Sonography Speech pathology	Digital health Digital literacy Clinical informatics Medical informatics eHealth	Capability framework Capability Competence Healthcare delivery Clinical workforce

Three general frameworks were subsequently identified and reviewed by the expert steering group:

- The National Nursing and Midwifery Digital Health Capability Framework⁷
- The Health and Care Digital Capability Framework⁸
- The eHealth Capabilities Framework for Graduates and Health Professionals⁹

Whilst all contained relevant components, it was agreed that none individually met the specific needs of allied health practice, and the development of a new allied health framework was therefore recommended.

Phase 2: Identification of Themes

Expert panel discussions and individual interviews were conducted with members of the steering group and other sector leaders to explore essential digital health capabilities, current challenges, and future opportunities specific to allied health practice. Two panel discussions were convened involving representatives from allied health therapies and allied health science professions and nursing and medical leadership with a stated interest in digital health. The inclusion of both allied health therapies and sciences was important to ensure transferability of content across the breadth and depth of allied health profession groups. Panel discussions were largely focused on contemporary healthcare practice trends and the role of digital health technology. Individual interviews were then conducted with individual digital health and clinical informatics experts across all professional groups to identify required digital health capabilities at a more granular level.

A total of 13 experts attended one of two panel discussions. Ten experts participated in additional one-on-one interviews, six of whom had also participated in the panel discussions. Questions used in the panel discussions are outlined at Table 2.

Table 2. Panel discussion and individual interview question sets

Panel	Questions
Expert panel 1 - allied health therapies and allied health science professions	<ol style="list-style-type: none"> 1) What is your understanding of digital health / clinical informatics? 2) Why is digital health / clinical informatics capability important for the allied health workforce? <ol style="list-style-type: none"> i. Why does the allied health workforce need a digital health / clinical informatics capability framework?
Expert panel 2 - allied health, nursing and medical leadership and management	<ol style="list-style-type: none"> 3) What impact will a digital health capability framework for allied health have on providing safe and high-quality care? 4) Our main aim as AHPs is to provide safe and high-quality care. What digital health capabilities would assist in achieving this aim? <ol style="list-style-type: none"> i. Are there digital capabilities that are unique to allied health practice? ii. Are there any other digital health capabilities that are essential to this framework? 5) What challenges do you see in the future for allied health in digital health or clinical informatics? How could these be addressed? 6) What opportunities do you see in the future for allied health in digital health or clinical informatics? How could these be addressed? 7) Do you have anything else to add?
Individual interviews with digital health and clinical informatics experts	<ol style="list-style-type: none"> 1) What is your current position, and what does it involve? 2) What is your understanding of digital health / clinical informatics? 3) How did you become involved in digital health / clinical informatics? 4) What is the impact of digital health on allied health? 5) What would make digital health / clinical informatics more useful or meaningful to AHPs? 6) How does a digital health capability framework for allied health differ from other digital health capability frameworks? 7) What makes allied health different to other health or medical professionals? Why are allied health unique? 8) Thinking broadly, what digital health capabilities are essential for allied health? 9) Are there other digital health capabilities that are important, but not necessarily specific to allied health? 10) What effect will digital health have on allied health in the next 5-10 years? 11) What future opportunities exist in digital health? 12) What future challenges exist in digital health? How could these be addressed? 13) Do you have anything else to add?

Discussions were recorded and transcribed by an independent transcription company, with inductive thematic analysis of the data then completed by two independent reviewers. The analysis identified 420 codes, which were condensed into 26 sub-themes and five overarching themes (refer to Figure 2).

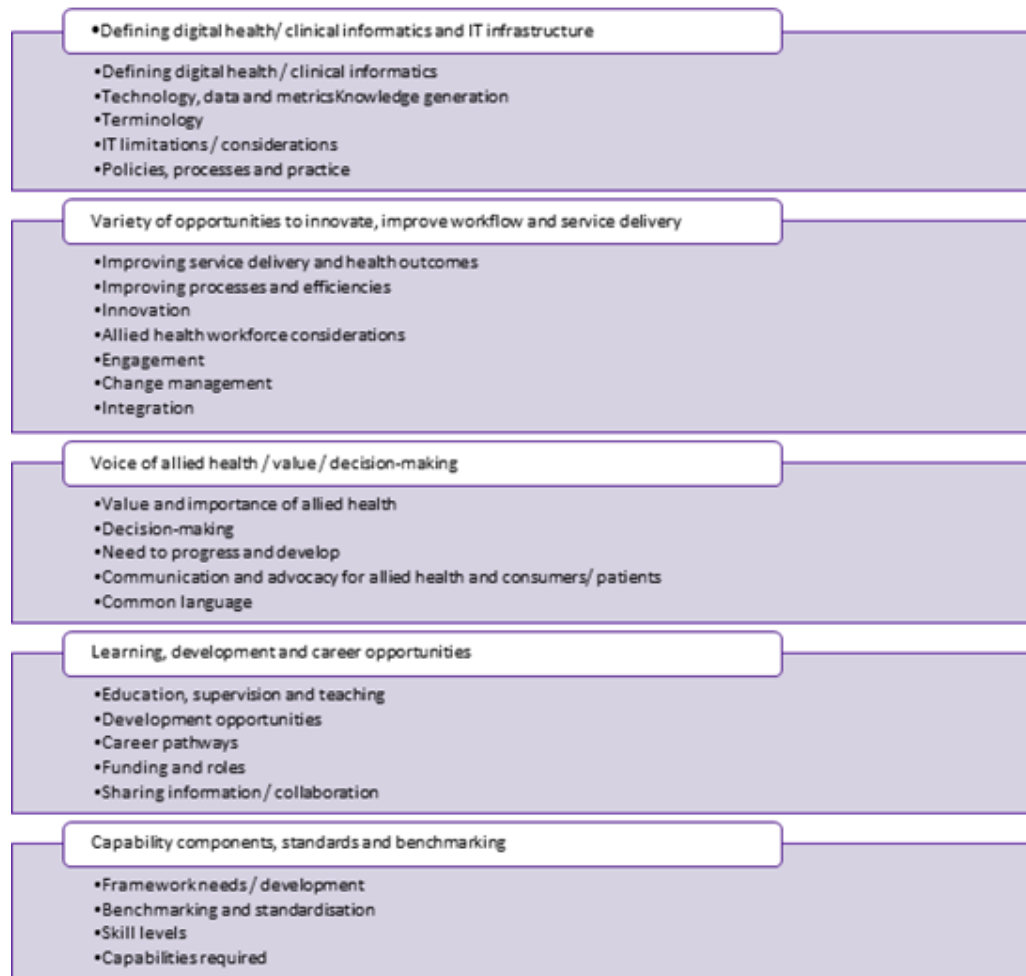


Figure 2. Themes and sub-themes identified from expert panel discussions and interviews

Phase 3: Framework Development

An expert working group was convened to develop the capabilities underpinning the framework. Membership was drawn from Chief Allied Health Information Officer roles, allied health directors/managers and clinicians from allied health therapy and science professions.

The working group considered the three general frameworks identified through the scoping review along with the themes identified in Phase 2 to identify potential capabilities. A total of 44 individual capability statements were created that were considered essential for the provision of safe and effective allied health services within a digital health environment.

The final capabilities were grouped to form four practice domains:

- The Digital Workplace
- Digital Professionalism
- Data and Analytics
- Digital Transformation

Subdomains were then developed to group conceptually related capabilities.

The working group members then identified the knowledge and behaviours implicit within each domain/subdomain and align capability statements to the levels of Foundation, Consolidation, Expert and Leader (refer to Figure 3).

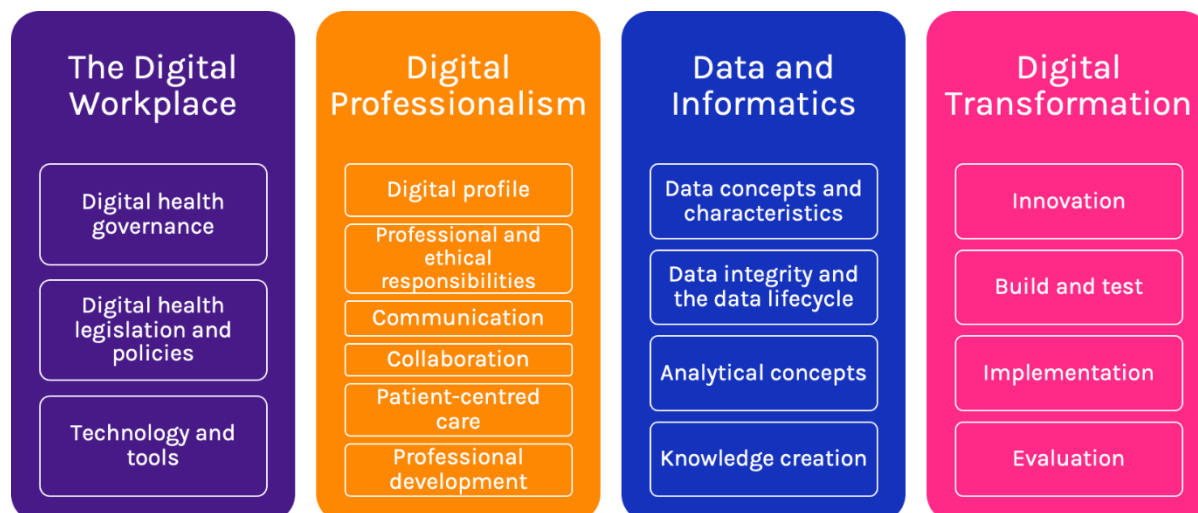


Figure 3. Practice domains and sub-domains

Phase 4: User-Acceptance Testing

User-acceptance was completed via distribution of the draft framework and an online survey of Victorian AHPs. These were circulated by the Manager, Allied Health Workforce, DH via electronic contact lists for public health services, professional associations, and university partners.

The survey included closed-ended questions to examine the language and format of the framework and open-ended questions to explore what participants liked most/least about the framework. Likert scores and free-text responses were used to capture participant's views about their likely adoption of the framework.

One-hundred and sixty-four (164) AHPs completed the survey, in the context of a total Victorian workforce of approximately 42,000 AHPs.¹⁰ Whilst this is an extremely small response rate, it should be noted that the survey was conducted in the midst of the Victorian coronavirus (COVID-19) pandemic response, and digital health is still viewed as emerging area of practice within the Victorian and Australian contexts.

Demographic details of survey respondents are available at Table 3.

Table 3. Demographics of survey respondents

Respondents	n=164	
Discipline background	Allied health therapies	n=140 (85%)
	– Physiotherapy	n=42
	– Social work	n=25
	– Occupational therapy	n=19
	– Dietetics	n=12
	– Speech pathology	n=10
	– Psychology	n=10
	– Podiatry	n=8
	– Prosthetics/ Orthotics	n=5
	– Exercise physiology	n=2
	– Allied health assistance	n=2
	– Other	n=5
	Allied health sciences	n=24 (15%)
– Radiography	n=7	
– Radiation therapy	n=5	
– Pharmacy	n=5	
– Sonography	n=2	
– Respiratory / sleep science	n=3	
– Other	n=2	

Professional experience	<2years 3-5 years 6-10 years 11-15 years >16 years	n=7 (4%) n=13 (8%) n=26 (16%) n=29 (18%) n=89 (54%)
Location	Metropolitan Melbourne Regional Victoria	n=126 (77%) n=38 (23%)
Sector	Acute hospitals Subacute/rehabilitation service Primary health/community Other	n=87 (53%) n=22 (13%) n=28 (17%) n=28 (17%)

User-acceptance testing was strongly positive for ease of use (91%) and comprehension of language (82%). Half of all respondents indicated they were either somewhat or very likely to use the Framework (refer to Table 3).

Table 4. Feedback from survey respondents

Survey respondents	n=164	
<i>Was the framework easy to follow?</i>	Yes No	n=149 (91%) n=15 (9%)
<i>Was the language used in the framework easy to understandable?</i>	Yes No	n=134 (82%) n=30 (18%)
<i>How likely would you be to use the framework?</i>	Very likely Somewhat likely Neither likely or unlikely Somewhat unlikely Very unlikely	n=24 (15%) n=58 (35%) n=47 (29%) n=23 (14%) n=12 (7%)

Multiple applications of the framework were identified including as a learning tool for digital health practice (33% of 164 survey participants), individual professional development guide (12%), workforce needs analysis tool (8%) and curriculum development reference (3%).

Potential barriers to uptake were identified as excessive document length (38%), unfamiliar terminology (15%), limited practical examples/implementation tools (15%), and questionable relevance for those with limited access to workplace technology (8%). Ten participants highlighted the need for a self-assessment tool to increase the framework utility.

Phase 5: Revision of Framework

Based on user-acceptance testing, case examples were incorporated throughout the framework to provide context for the practical application of content. A self-evaluation tool with applied examples was also developed to complement the framework.

DISCUSSION

This program of work used a mixed-methods approach to develop a framework to support AHPs, health services, other employers and education partners to measure and expand digital health capability for individual practitioners and workforce groups. This approach proved successful in managing key challenges that emerged during the project, as well as identifying potential barriers and enablers to framework implementation, adoption, and maintenance.

Inconsistencies in definitions of 'digital health' and 'clinical informatics' were identified at the outset of the project, with terms noted to be used interchangeably to describe similar constructs. It was deemed essential to clearly define these terms and their intersect to support and sustain the focus of the project, as well as the resultant framework and its application. When developing future healthcare frameworks, consistent definition of terminology is a key recommendation.

Concerns regarding organisational investment in digital health infrastructure and variation in digital maturity were also noted as risks to project success and the ultimate uptake of the framework. SMEs determined that the development of the framework was an important step towards addressing this potential barrier and promoting the benefits of digital health investment. It was noted that realisation of benefit would be important messaging in release of the framework to the sector, particularly the efficiency,

effectiveness and safety of service delivery and patient experience and outcomes. Organisational investment in capability frameworks from their inception is an important step to optimise success and sustainability.

The proposed scope of the framework and its relevance across diverse professional groups, organisations and sectors was another challenge. Whilst there are inherent differences in skills-sets within and between allied health professions and workflows across practice settings, the project presented a strategic opportunity to recognise and promote the depth, breadth and collective value-add of the allied health workforce in digital health. SMEs were requested to consider how transferrable knowledge and skills could inform the development of capability statements, and a flexible approach to the operationalisation of capabilities across differing clinical workforces, tasks and practice settings.

The mixed-methodology and stakeholder consultation approach facilitated early identification of potential barriers and enablers to implementation of the framework. Perceived resistance from clinicians inexperienced in using digital technologies was commonly cited as a key barrier to framework adoption. This issue was posed to SMEs who recommended that existing allied health knowledge, skills, and attributes should form the basis of digital health capability statements where relevant, thus providing a link between traditional and evolving practice within a digital environment. These factors were subsequently addressed and embedded within the final framework design. SMEs also acknowledged that the degree and rate of uptake of digital health technologies demonstrated by AHPs during the COVID-19 pandemic response provided a positive indicator of the workforce's willingness to embrace digital technologies, and that the framework would therefore likely be well-received to support digital transformation.

User-acceptance testing also strongly indicated the importance of providing real-world examples to illustrate capability statements and aid practical application. Introductory text to each domain and subdomain was drafted to contextualise skill development in practice. Each capability statement was also mapped across progressive capability levels to define demonstrable behaviours for each competency level. Case vignettes were used to illustrate the practical application of combined capabilities at a domain level. It is recommended that future frameworks in healthcare consider including contextual examples to optimise relevance for the intended audience.

The need for targeted education and training in digital health was also identified as pivotal to successful uptake at clinician, organisational and sector levels. Various complementary products were developed in parallel with the framework to support gap analysis and strategy development. The inclusion of a learning tool and professional development guide was designed to support use of the framework by individual clinicians, whilst a workforce needs analysis tool and curriculum development reference were intended to aid systems-level translation. When devising frameworks in the future, authors should consider creating learning and development tools to increase uptake by intended users, as well as endorsement from aligned industry groups.

Future Directions

The release of the framework in late 2021 signals a new digital era for allied health practice within Victoria, and positions allied health to collectively meet new and emerging practice challenges. The framework provides a common language to understand expectations for practice with digital technologies and environments. At its' most simple level, the framework can be used to identify learning needs, develop targeted educational strategies, and measure shifts in individual and work-group capability. However, its greater potential lies in its ability to map digital maturity and training needs at workforce and whole-of-system levels, and to connect training pipelines from undergraduate student curriculum to graduate-entry and ultimately clinical expert.

Longer term, it is envisaged that the framework will also drive digital health capability, innovation and foster leadership opportunities and specialist career pathways in digital health and clinical informatics.

CONCLUSION

A mixed-methods approach was used to develop the Victorian *Allied Health Digital Health Capability Framework* to measure and expand digital health capability for individual practitioners and workforces. This methodology reflects the aspirational objectives of this project and the importance of ensuring strong sector engagement and ownership of the core knowledge, skills and behavioral attributes that underpin workforce performance.

The framework signals a new and exciting digital era for allied health practice and recognises the importance of workforce capability in realising the full transformative potential of digital health technologies for enhanced patient care and outcomes. It is envisaged that this framework will equip AHPs to respond to future challenges and system disruptors, both known and unknown, and to influence and drive innovation to achieve best practice healthcare and health outcomes for all Victorians.

Declaration of Funding

This project was fully funded by the Department of Health, Victoria, Australia.

References

1. Australian Institute of Health and Welfare. (2020). *Digital health*. Canberra: Australian Institute of Health and Welfare; 2020. Available at <https://www.aihw.gov.au/reports/australias-health/digital-health> (verified 4 November 2021).
 2. World Health Organization. Regional action agenda on harnessing e-health for improved health service delivery in the Western Pacific. Geneva: World Health Organization; 2018. Available at http://www.wpro.who.int/about/regional_committee/69/documents/wpr_rc69_8_regional_agenda_e-health_annex.pdf (verified 4 November 2021).
 3. State of Victoria. *Victoria's digital health roadmap: Improving patient care by lifting digital maturity in Victoria's public health services 2021-2025*. Melbourne: Department of Health; 2021.
 4. Australian Bureau of Statistics. *National state and territory population (September 2021)*. Canberra: Australian Bureau of Statistics. Available at <https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/latest-release> (verified 25 May 2022).
 5. Australian Digital Health Agency. *Australia's National Digital Health Strategy*. Sydney: Australian Government; 2018.
 6. Australian Digital Health Agency. *National Digital Health Workforce and Education Roadmap*. Sydney: Australian Government; 2020.
 7. Australian Digital Health Agency. *National Nursing and Midwifery Digital Health Capability Framework*. Sydney: Australian Government; 2020.
 8. National Health Service. *A Health and Care Digital Capability Framework: Building a Digital Ready Workforce Programme and Health Education England's Technology Enhanced Learning Programme*. United Kingdom: National Health Service; 2017.
 9. Brunner M, Mcgregor D, Keep M. et al. An eHealth capabilities framework for graduates and health professionals: Mixed-Methods Study. *Journal of Medical Internet Research* 2018; 20(5): e10229.
 10. Department of Health – Victoria. *Allied health workforce*. Victoria: Department of Health. Available from: <https://www.health.vic.gov.au/health-workforce/allied-health-workforce> (verified 25 May 2022).
-