

Supporting Digital Health Integration in a National Curriculum: The New Zealand Experience

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Abstract. The World Health Organisation considers that digital health can play a vital role in strengthening health systems, including increasing equity in access to health services; however, to realise the benefits of digital health this subject needs to be included in nursing education. In New Zealand the recent establishment of the centralised Te Pūkenga Institute of Skills and Technology allows for the creation of a common unified curriculum for entry to nursing programmes among the community-based tertiary education providers. Expertise to advise on the digital health component of the curriculum was sought from the New Zealand nursing and midwifery informatics group and this group's contribution is reported here. Delays in implementing the new curriculum means that by the end of 2023 no students had yet graduated, and evaluating their success, combined with research into the students' preparedness for working in a digital health environment is recommended.

Keywords. Nursing education, digital health, curriculum

1. Introduction

The World Health Organisation (WHO) report a global nursing workforce of 27.9 million, representing a needs-based shortage of 5.9 million nurses [1]. Digital health is seen as one of the solutions to help bridge this staffing shortage [2,3]. Yet, the inclusion and integration of digital health into nursing curricula remains problematic [4,5]. Furthermore, WHO considers that digital health can play a vital role in strengthening health systems, including increasing equity in access to health services [6]. However, to realise the benefits of digital health WHO recognise that nursing education needs to include the use of digital technologies [1]. In New Zealand (NZ) a recent change in creating Te Pūkenga allows for the creation of a common unified curriculum for entry to nursing programmes among the community-based tertiary education providers. Expertise to advise on the digital health component of the curriculum was sought from the NZ nursing and midwifery informatics group (Health Informatics NZ Nursing and Midwifery Special Interest Group: HiNZ NMI) and this group's contribution is

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reported here. Delays in implementing the new curriculum means that by November 2023 no students had yet graduated, and evaluating their success throughout the programme, is recommended, combined with longitudinal research into the students' preparedness for working in a digital health environment. A 2003 Canadian study found that less than 30% of schools of nursing reported having digital health content in their programme [7] although it is hoped that this would have improved over the last two decades. Many countries have considered the digital health or nursing informatics competencies that nurses need. For example, Canada [8]; Australia [9]; Austria, Germany, and Switzerland [10]; and others [11], including the Technology Informatics Guiding Education Reform (TIGER) international framework of health informatics core competencies for nurses [12]. NZ built on some of this earlier international work and in 2018 published their 'Guidelines in Informatics for nurses entering practice' [13]. However, developing competencies and having those competencies inform and integrated into nursing curricula is still a challenge [4]. One factor in this challenge is the lack of nursing faculty who feel prepared and able to teach digital health content [14]. A NZ study identified that nurse educators found there remained both challenges, such as the continual evolution of technology and therefore how to keep current, as well as enablers, such as easier access to and more visibility of technology in education and in clinical practice [15]. Further concerns identified by nursing faculty were the cost of technology, implementing digital health in an already full curriculum, e-waste and issues around data security [15]. A teaching toolkit has been produced by nurse educators in Canada to support educators to integrate digital health into their curricula [16]. The concerns about keeping such a published resource current when it contained links to articles and websites is allayed by the online resources provided by the Canadian Nursing Informatics Association (www.cnia.ca/general-resources). Nurse educators in NZ also wanted teaching and learning resources to be available across the different Schools of Nursing [17], but creating something like Canada's teaching toolkit is difficult in an environment that is competitive to attract students.

2. Case Study: Development of an Informatics Informed National Nursing Curriculum

In NZ 'digital health', rather than health informatics or eHealth is now the preferred term [18]. Digital health describes the information and communication technology (ICT) services across the healthcare system, encompassing mobile health (mHealth), virtual health, telehealth, big data, genomics, robotics, machine learning, virtual reality, and artificial intelligence (AI) [19]. However, both the government, and Nursing Council of NZ provide minimal guidance on how digital health is to be included in nursing education. In 2023 nursing education in NZ celebrated 50 years since moving from an apprenticeship hospital-based training model to one based in tertiary education, but stayed as a three-year programme of study [20]. Now, to become a registered nurse (RN) in NZ there are two options: either complete a three-year Bachelor of Nursing degree programme or a two-year graduate entry master's degree. The education to become a RN could be undertaken at one of fourteen technical institutes or polytechnics or through one of the seven universities. Community-based tertiary education changed in NZ in 2020 with the establishment of Te Pūkenga - NZ Institute of Skills and Technology. The creation of Te Pūkenga was announced by the NZ Government in 2018, and came into being in 2020, to combine 16 technical institute or

polytechnics (ITP's) and nine industry training organisations into one single organisation. The aim was to create a national unified and cohesive vocational education and training system, impacting many disciplines and subjects, including nursing education. Undergraduate and graduate nursing programmes are now available at 13 of the original ITPs. Te Pūkenga graduates approximately 75% of RNs, while the Universities provide the majority of postgraduate education. Part of this change of establishing Te Pūkenga was the plan to introduce a national unified nursing curriculum for students completing a three-year Bachelor of Nursing programme. The national nursing and midwifery informatics group, HiNZ NMI, was asked to advise and support the digital health component of the new national unified nursing curriculum. The educational preparation of RNs is governed by the Nursing Council of NZ which is both the regulatory and statutory body governing the profession [21].

3. Project Design

Nursing leaders from within the Te Pūkenga network began collaboration on the development of a single unified nursing degree in 2021, with an initial curriculum taking shape by early 2022. From mid-2022 HiNZ NMI were sent multiple documents to comment on, giving the opportunity for iterative feedback as the national unified nursing curriculum developed. When new material needing feedback was received it was shared electronically among the leadership team of HiNZ NMI, then a meeting would take place virtually or in person, where the content and our collective response was determined. For the collation of teaching and learning resources, described below as Phase Four, resources were provided to one member (RS), who served as the contact person for the Te Pūkenga curriculum development and learning design team.

4. Execution

Phase 1. Programme Acceptability and Consultation Document for Te Pūkenga

Feedback was sought on a first, more general document and the overall feedback provided was:

There needs to be an emphasis on future proofing in regards to many aspects of this curriculum, especially information science. The future nursing environment will be driven by information and data, and this is not evident in this curriculum. We are now living in a time where people have more access to health information including apps and equipment than ever before, and nurses need to be prepared to support our people to make the right choices and understand the information they are gaining about themselves to support wellness and a healthy attitude towards that. It is too low level in relation to information science. It comes back to critical thinking – having the skills and knowledge to make decisions, including around the use of digital health.

Phase 2: Graduate Profile

Rather than creating new attributes within the Graduate Profile additions were made to the existing attributes to ensure they included use of digital solutions. For example, the attribute of communication became:

Apply interpersonal, therapeutic communication and relational practice skills as key to health consumers, their whanau, hapu, iwi and hapori [Māori words related to family and kinship] centred nursing care in person or via information and communication technologies (ICT).

Phase 3: Narrative Statements

Narrative statements were sought to explain the position of different components of the curriculum, such as digital health, so the intent of the curriculum would be clear. These were divided into statements for each of the three years of the curriculum. As an example, the digital health statements for the first year of the programme are:

The first-year student needs to gain a foundational understanding of digital health that underpins the care that they will deliver in practice, from verbal communication to documentation in clinical notes and inputting data into a patient management system. Key learning relates to relevant legislation for privacy, confidentiality, codes and guidelines for safe, legal and ethical practice. Social media is highlighted early in the year and firm boundaries established which uphold professional practice. Students should also demonstrate health and digital literacy through beginning academic writing, such as locating relevant information, referencing appropriately and finding evidence to support practice. Digital literacy should also include professionalism in email and forum contributions and when using learning platforms. There needs to be an understanding that data is a taonga [a treasure]; data is people.

Phase 4: Collation of Teaching and Learning Resources

To increase the efficiency of resource development and to support consistency of delivery Te Pūkenga have established a central repository of teaching and learning resources. HiNZ NMI were approached to assist with the provision of these.

Resources, either shared or suggested for use included:

- Teaching resources such as PowerPoint presentations and learning activities.
- Resources available on the Health Informatics NZ website including webinars, discussions of emerging technologies and the application of informatics competencies.
- Digital health resources available from the national government level Te Whatu Ora Health NZ or Ministry of Health for current health consumer information, consumer facing health apps, and telehealth portals.
- International resources from the wider health and nursing informatics community such as the TIGER network and the Canadian Nursing Informatics Association.

5. Analysis

HiNZ NMI have been in a unique position to support the development of this national unified curriculum. One of the challenges is ensuring digital health is seen as part of foundational clinical practice and not an adjunct. Regardless, the basics of digital health literacy need to be embraced by educators, students and clinical environments and this was recognized by Te Pūkenga. Having a HiNZ NMI member who also worked for Te

Pūkenga who acted as the contact person was advantageous to collaborating with learning and course developers.

Even in this age of readily accessible digital technologies, students enter nursing programs with a range of digital skills and abilities. Rapidly emerging technologies coupled with changes and evolution within healthcare make it essential that nursing graduates are well prepared to enter the workforce with the digital skills to provide safe, competent and effective care. The effectiveness of any curriculum needs to be evaluated, and the assessment of digital health competencies will be needed as each year of the unified curriculum is implemented, and to also consider graduates readiness for practice [22, 23].

Nursing faculty being confident to teach digital health was a recognised problem in NZ, and one of the drivers for providing centralised learning resources. This is also a globally recognised issue, with WHO emphasising the importance of faculty recruitment, retention and development [1]. Literature highlights concerns about trying to keep abreast of digital health developments, when this is a field that is changing rapidly [14, 15]. Further and ongoing research into what nurse educators need to support their teaching of digital health is therefore needed, as well as establishing robust links with clinical partners.

6. Impact and lessons learned

Constraints facing the introduction of the national unified nursing curriculum include delays in introducing the curriculum, nursing faculty shortages and uncertainty with a general election in late 2023 and a change of government. In addition, NZ has undergone significant restructuring of the health system, which has resulted in additional stress in the health sector, compounded by staff shortages post Covid-19. These factors can impact the clinical practice experience of nursing students, yet are beyond the control of tertiary education providers.

A limitation of this work is that the national unified nursing curriculum is as yet untried as no students have graduated. A longitudinal study to evaluate student success in each module through the curriculum is recommended. Further research should also assess the delivery, teaching and learning resources and digital capability of students. It is also recommended to assess the students and new graduates' preparedness for working in a digital health environment.

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