INTERPROFESSIONAL EDUCATION

The four-dimensional curriculum framework: 10 years on

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Abstract

The Four-Dimensional Curriculum Framework (4DF) was first published in *Focus on Health Professional Education* in 2013. It was created in response to a gap in the literature for a curriculum development tool for interprofessional health that could navigate the challenges associated with conceptualising shared educational opportunities across siloed health professional programs. Its four interconnecting dimensions emphasise the dynamic interplay between curricular elements, highlighting the fact that curriculum design is rarely linear. As a theoretical curriculum framing tool, it facilitates the articulation of big picture considerations when designing learning and teaching activities. Since 2013, it has been cited 60 times by researchers and educators across the globe, indicating that it has been used largely as it was originally intended—to interrogate the purpose and effectiveness of a curriculum in broad terms. This paper revisits the features of the 4DF and, in the light of its application in the literature, explores opportunities to expand its functionality from a theoretical framing tool to one that also provides a practical application of the framework.

Keywords: curriculum development; interprofessional; health professional education; quality assurance

Introduction

In the past 15 years, there has been much interest in developing novel ways to move students and training programs out of professional learning silos and into more interprofessional and collaborative learning environments to prepare graduates for contemporary workplace practice. New service delivery models focusing on preventative and community-led care frameworks need work-ready graduates for complex and interconnected clinical environments. However, most training and education programs across the health professions, nationally and internationally, are delivered in isolation from one another. In 2007, a group of Australian educational researchers were successful in obtaining a national research grant to explore the challenges associated with national

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curriculum review. Known as the Curriculum Renewal Studies (Steketee et al., 2014), the focus of early activities included a scoping and development study to establish a national research and development agenda for interprofessional education (IPE) within higher education (Thistlethwaite et al., 2009). One of the first pieces of work was a national review of educational stakeholder perspectives on their needs for curriculum renewal (Matthews et al., 2011). Findings included the recognition of limitations and lack of resources to guide the development of whole curricula within and across institutions.

In response to this finding, members of the research team realised that an evidence-based and conceptually robust curriculum development framework was missing. There was a clear need for a flexible scaffold to support curriculum development and renewal across multiple educational contexts—both uniprofessionally and interprofessionally. There was also a clear need for a tool that was responsive to the ever-evolving "big picture" requirements of curricula, one that recognised the social, cultural and broader societal influences on the education of students for the health professions. Subsequently, between 2011 and 2012, the team completed a review of the published education literature, and a set of principles was identified, informed by contemporary educational theories. These principles formed the basis of the Four-Dimensional Curriculum Framework (Lee et al., 2013).

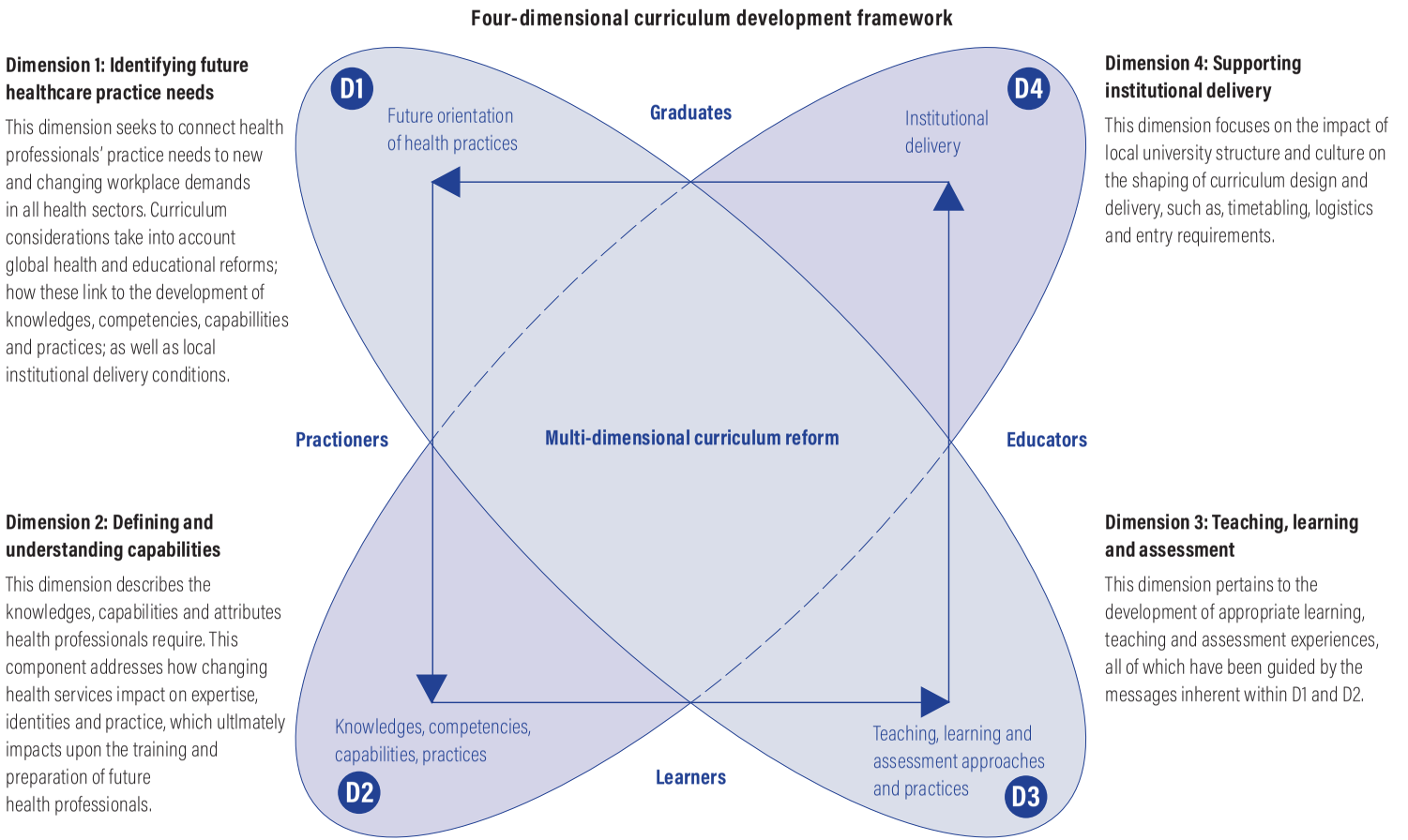
What is the Four-Dimensional Curriculum Framework and what does it aim to do?

The Four-Dimensional Curriculum Framework (4DF) is conceptualised as a dynamic, multi-dimensional tool to guide curriculum design, development and reform. Its fundamental aim is to "help health professional educators … link educational practice to health policy, workforce and professional practices in a coherent and reflexive way" (Lee et al., 2013, p. 69).

As depicted in Figure 1, the four dimensions are interrelated. Dimension 1 focuses on the future orientation of health practices, including historical as well as contemporary practice, shifting workplace demands and future directions in healthcare. Dimension 2 addresses the professional values, attitudes, standards, knowledge and skills articulated within professional practice. This dimension links with Dimension 1 through the recognition that skills and practice development must align with real-world needs and changing practice priorities and contexts. It attends to the dynamic relationship between "knowing, being and doing" as a professional (Barnett & Coate, 2005). Dimension 3 speaks to the core educational activities that facilitate the development of the competencies and capabilities discussed in Dimension 2. The design, planning and delivery of learning, teaching and assessment is also influenced by workplace practices and evolving changes to healthcare policy and patient needs. Dimension 4 considers the organisational governance and administrative procedures specific to the educational environment in which the learning program is being delivered. It reflects how the university conceptualises itself, its location and its relationship with the health sector.

Figure 1

Four-Dimensional Framework for Curriculum Development (Lee et al., 2013)



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These features of the organisational culture will impact on, and be impacted by, the other three dimensions.

What are the strengths of the 4DF?

The literature on curriculum has traditionally focused on the structure and content of material to be learned by students (Fraser & Bosanquet, 2006), as well as competencies to be mastered and/or outcomes to be achieved (Prideaux, 2003). This one-dimensional view of curriculum is limiting, as it artificially disconnects learning from the professional context within which it will be applied. This is particularly problematic for health professional education, where knowledge is created, extended and stored not just within the academy but also in places of practice (Lee & Dunston, 2011). An important feature of the 4DF is that it invites curriculum designers to ask the question *curriculum for what*, which acknowledges the broader purpose of training for the professions. Beyond completing a course and earning a degree, learning is the process of *becoming* a professional (Barnett, 2009) and meeting societal needs and workforce demands.

In addition to encouraging a broader perspective of curriculum, the 4DF also recognises the involvement and interplay between multiple stakeholders in its co-creation. Whereas curriculum in higher education has typically been viewed as the possession of the academic alone (Hicks, 2018), contemporary curriculum development is a team effort involving subject matter and design experts, students, industry partners, health service consumers and quality assurance reviewers. The multi-dimensional nature of the 4DF fosters a dynamic, interactive and iterative design process as stakeholders negotiate and renegotiate the final product, otherwise known as the *official curriculum*. It also allows for the articulation of the *hidden curriculum*, as the values, assumptions and biases of stakeholders emerge through this negotiation process. The tension that often exists between the original intentions of the official curriculum and what is actually taught, assessed and learned has been discussed widely in the literature. The 4DF aims to address this tension by giving all stakeholders a common lens through which the complex and multiple layers of a curriculum can be visualised and discussed.

The 4DF has some parallels to Kern's 6-step approach to curriculum development, in that they both emphasise the interactions and relationships between the planning, development and implementation phases. Kern's model, however, tends to favour a linear, sequential approach to learning (Thomas et al., 2015), whereas the 4DF recognises both the ill-structured and the integrated nature of domains within health professional curricula. Learning is not always linear, and strategies that aim to constrain the acquisition of knowledge from simple to complex can lead to the over-simplification of ill-defined, multi-layered problems.

How has the 4DF been applied in the past 10 years?

A literature search of Google Scholar was conducted to find instances between 2014 and 2021 where the 4DF has been cited. Sixty confirmed citations of the original paper

were found, spanning all six inhabited continents. All four authors reviewed the titles and abstracts of the papers to verify their inclusion as instances where the 4DF has been used in consideration of a curriculum. Four of the citations were essentially descriptions of the framework in publications that reported the larger Australian programs of IPE development of which it was a part (Steketee et al., 2014; Moran et al., 2015; Dunston et al., 2015; Thistlethwaite, 2015). Thirty-seven citations were relatively minor references to the 4DF as a useful approach to curriculum development in interprofessional (e.g., Forman & van Leit, 2015) and uniprofessional contexts (e.g., Fennelly et al., 2020) or noted its focus on the purpose of curriculum in relation to effecting change in health practice to drive improved outcomes (e.g., Weber et al., 2021). The remaining 19 citations reported the extensive utilisation of the 4DF to develop or reform interprofessional or uniprofessional curricula in 17 distinct projects in Australia (Maxwell & Blashki, 2016; Shipton, 2020; Thistlethwaite, 2021; Young et al., 2021), New Zealand (Pullon & Symes, 2019; Shipton, 2020), Indonesia (Juniarti et al., 2016), Canada (Mador, 2018; Mador et al., 2020), the USA (Desmarais, 2018; Mador et al., 2020), Sweden (Abrandt Dahlgren, 2015; Falk et al., 2015), Switzerland (Ledergerber & Feusi, 2019), Ireland (Cunningham et al., 2021; Rackard & Cashman, 2019), the United Kingdom (Ryan et al., 2016; Brown Wilson & Slade, 2020) and South Africa (Govender & de Villiers, 2021; Pitout et al., 2019; van Jaarsveld, 2018). Seven projects were explicitly interprofessional (Abrandt Dahlgren, 2015; Falk et al., 2015; Ledergerber & Feusi, 2019; Pitout et al., 2019; Pullon & Symes, 2019; Ryan et al., 2016; Thistlethwaite, 2021; Young et al., 2021), with the remainder confined to a single profession, including medicine (Mador, 2018; Mador et al., 2020; Maxwell & Blashki, 2016; Shipton, 2020), nursing (Juniarti et al., 2016), occupational therapy (van Jaarsveld, 2018), physiotherapy (Cunningham et al., 2021), dental hygiene (Desmarais, 2018) and veterinary medicine (Rackard & Cashman, 2019). Uniprofessional projects were often focused on specific curricular areas, such as trauma surgery (Mador, 2018; Mador et al., 2020), "family nursing" (Juniarti et al., 2016), "community physical activity" within physiotherapy (Cunningham et al., 2021) or climate change medicine (Maxwell & Blashki, 2016).

The projects were reported in a variety of media, including edited books (Falk et al., 2015; Ryan, 2016; Thistlethwaite, 2021), research theses (Desmarais, 2018; Mador, 2018; Shipton, 2020; van Jaarsveld, 2018), a German language journal (Lederberger & Feusi, 2019) and a diverse range of English language journals, such as *Medical Teacher* (Govender & de Villiers, 2021), the *Journal of Interprofessional Care* (Pitout et al., 2019), the *Journal of Public Health Research* (Maxwell & Blashki, 2016), the *Indonesian Nursing Journal of Education and Clinic* (Juniarti et al., 2016), the *Journal of Veterinary Medical Education* (Rackard & Cashman, 2019), the *Canadian Medical Education Journal* (Mador, 2020), *BMC Medical Education* (Cunningham et al., 2021) and *The Clinical Teacher* (Young et al., 2021).

Interestingly, in several reports, the 4DF was combined with other curriculum development tools or concepts, such as Harden's SPICES approach—which stands for

student-centred, problem-based, integrated, community-based, electives, systematic (Govender & de Villiers, 2021), Kern's 6-step model (Mador, 2018; Mador et al., 2020) and Deverell's "crisis-induced learning" (Govender & de Villiers, 2021). Brown Wilson and colleague (2020) also suggested the addition of two further dimensions (professional accreditation concerns and client needs) to derive a six-dimensional framework.

What is the next phase of the 4DF's evolution?

The 4DF is a visionary tool. It invites curriculum developers to connect curriculum objectives and activities with workforce expectations and societal needs. This has been the thesis underpinning most of the utilisation of the 4DF to date, where it has been used to interrogate the purpose and effectiveness of curriculum in broad terms. This is a pleasing finding, as often the big picture issues surrounding a curriculum get lost in the design detail.

Kayyal & Gibbs (2012) note, however, that in order for the greater goals of a curriculum to be satisfactorily met, a systematic approach should be adopted to ensure that the necessary infrastructure (both cultural and physical) is in place. They suggest that a stepwise approach to quality assurance is critical to achieving the desired outcomes of curriculum renewal or transformation. In so far as the 4DF is concerned, this can be achieved by operationalising each of the criteria in the four dimensions into quality assurance checks to guide each step of the curriculum design (or review) process.

In considering what this next phase of the 4DF's evolution might look like, the Interprofessional Collaborative Organisational Map and Preparedness Assessment (IP-COMPASS) has been drawn on for inspiration, given the similarities it shares with the 4DF in terms of its development and its focus. For example, both were developed by a team of interprofessional education experts and both focus on practitioners, educators, students and graduates as well as the supports needed for institutional delivery. The IP-COMPASS was developed through a rigorous process that included a multiple case study research project involving senior administrators, leaders, educators and students from education and practice contexts. It underwent an expert panel review and was pilot tested across 16 sites (Parker et al., 2012).

The IP-COMPASS identifies the factors essential to the successful implementation of IPE within four constructs: commitment to interprofessional collaboration (IPC), IPC structures and supports, commitment to IPE and IPE structures and supports. Curriculum developers work through a structured process to understand their institution's values, structures, processes, practices and behaviours (Parker et al., 2012). Stakeholders are then invited to engage in a critical review of the status of IPE and IPC implementation, areas of strength and areas for improvement. The outcome of this process is a plan for action, implementation and review. Overlaying the operational process of the IP-COMPASS with the dimensions of the 4DF provides educators with a

practical guide to self-assess their organisation's health professional education curricula within the broader theoretical context of a course.

While the IP-COMPASS has been devised to guide the evaluation of IPE curriculum specifically, the process can be easily adapted to guide the development or review of curricula using the 4DF for any discipline. Whether in the initial development or subsequent review and evaluation phase, the first step is to form a team with representatives from the key stakeholder groups—educators, health practitioners, students, graduates and health service users—to pool knowledge, expertise and perspectives. This team would systematically work through each of the 4DF's dimensions, using self-assessment criteria outlined as follows:

Dimension 1: The big picture decisions (the "why")

This first dimension of the 4DF focuses on the future orientation of health practices, examining stakeholder input, the vision and context of the curriculum, as well as the review process. The four essential criteria for this dimension are:

- The curriculum design has involved a range of key stakeholders (including service users)
- The curriculum's vision is clearly stated and relevant to future health practice and contemporary models of healthcare
- The curriculum considers the social, historical, political, economic, cultural, professional and educational context
- Curriculum review occurs at regular intervals to ensure relevance to current and future workforce needs.

Dimension 2: Defining capabilities of graduates (the "what")

This second dimension focuses on the knowledge, competencies, capabilities and practices within the curriculum, as well as their alignment with the requirements of key bodies and with the vision for the curriculum. The four essential criteria for this dimension are:

- The knowledge, capabilities and attributes (knowing, doing and being) of health professionals are clearly articulated
- The knowledge, competencies, capabilities and practices or standards align with the requirements of registration and accreditation bodies
- Health professional practice is viewed as multidimensional, requiring cultural competence (Horvat et al., 2014), contextual competence (Schrewe et al., 2018) and team competence (Lingard, 2016)
- Capabilities and practices are explicitly linked to the curriculum's vision.

Dimension 3: Teaching, learning and assessment (the "how")

The third dimension focuses on the curriculum's teaching, learning and assessment approaches and practices, including the use of current education approaches and theory. The four essential criteria for this dimension are:

- Contemporary educational practices have been adopted, such as student engagement and industry partnerships (e.g., Healey et al., 2014)
- The underpinning theories and assumptions about learning are clearly articulated (e.g., Hean et al., 2009)
- Teaching, learning and assessment practices align with these theories and assumptions
- Patients or service users are engaged in teaching and assessment (Gordon et al., 2020).

Dimension 4: Organisation (the "where")

The fourth, and final, dimension focuses on the organisational and administrative context, encompassing the institution's norms, protocols and procedures as they impact on curriculum design and delivery. The four essential criteria for this dimension are:

- Leaders clearly demonstrate their support for the curriculum's vision, given their critical role in curriculum change (Anakin et al., 2018)
- Organisational structures and processes (e.g., timetabling, logistics, course-entry requirements) are reviewed to ensure they support rather than impede achievement of the curriculum's vision
- Time, people and money are committed to curriculum design, delivery and evaluation, demonstrating valuing of the curriculum and ensuring successful implementation (Kezar, 2011)
- Contributions to curriculum design and evaluation are recognised, rewarded and celebrated in the organisation (Kezar, 2011).

Ideally, these criteria would be tabulated into a checklist and, as the team works through each of them, rated according to the extent to which they have been met. The team would also look for alignment between the criteria in each dimension. Where there is weak evidence that criteria have been addressed, this would trigger the development of an action plan. The expectation is that this process encourages a structured discussion with all stakeholders (including senior leaders in the university) as well as relevant accreditation bodies. Regular reviews of the curriculum using the quality assurance checklist will ensure that the action plan is being implemented appropriately and identify whether there are further aspects that require improvement.

Conclusion

The 4DF evolved in response to a need for a design tool to support a more comprehensive and holistic conceptualisation of curriculum, moving away from the limitations of linear

and narrow models that fail to recognise the multiple contexts and changing drivers impacting educators, students and their environments. The framework articulates four equally valued dimensions interacting with one another within a dynamic and ever-changing set of spaces and representing the complexities of real-world curriculum design and delivery. Since it was first published 10 years ago, it has been used by educators and researchers across the globe and in a wide variety of educational and professional contexts to guide curriculum development and reform. Its use by some authors in combination with other curriculum development tools speaks to its versatility in supporting dynamic curriculum planning going beyond linear frameworks. A quality assurance checklist informed by the IP-COMPASS has been proposed as the next phase in the 4DF's evolution to support the practical application of its four dimensions and to ensure that the broad intentions of curricula are not lost in the design and implementation detail.

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