

LETTER

Response to Purdy (2026) regarding 'Transformative simulation' key concept infographic

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We welcome the opportunity to clarify the conceptual and methodological basis of Transformative Simulation as presented in the Key Concept article [1].

In response to the issues raised in the letter by Purdy [2], we address four areas: (1) conceptual lineage and positioning of Transformative Simulation, (2) the relationship between Transformative and Translational Simulation, (3) the methodological basis of the taxonomy and (4) the purpose and format of the Key Concept article. We also clarify the subsequent development of the framework as part of an ongoing programme of work.

We acknowledge the important conceptual contribution made by Brazil in the Debate article on Translational Simulation, which compellingly reframed simulation according to its functional purpose rather than its physical location [3]. That work emphasized the alignment of simulation with service priorities and patient outcomes and has influenced subsequent thinking in the field.

The Key Concept article is a synthesis of previously peer-reviewed work and does not introduce new analytic claims beyond the published taxonomy and subsequent literature.

The Review article [4] questioned by Purdy [2], on which this Key Concept article [1] is based was designed to address the fragmentation of terminology and objectives across the broader non-pedagogical simulation literature. Its purpose was not to redefine Translational Simulation nor to establish conceptual primacy. Indeed, a later article by Brazil and Reedy stated: 'In our use of the term Translational Simulation, we mean a conceptual framing, rather than a technique, taxonomy or label. We embrace and encourage ongoing work toward consistency in terminology, and view that as an important part of an evolving conceptual model' p.6 [5]. Through explicit inclusion and exclusion criteria, the Weldon et al. review focused on primary application articles in order to generate an empirically grounded taxonomy [4]. Consistent with this methodology, literature reviews, editorials and debate articles were excluded, including the 2017 Translational Simulation debate piece and other similar conceptual articles.

Although similar sounding, the conceptual descriptions of Translational and Transformative Simulation are distinct:

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Translational Simulation: argued for using the *function* of simulation as its descriptor and offered Translational Simulation as an appropriate term for describing the subset of simulation activities that are directly focused on improving healthcare processes and outcomes [3].

Transformative Simulation: was described as: *simulation as a tool to transform health and care through collective understanding, insight and learning*, and to distinguish it from the more traditional educational/pedagogical approaches that are more commonly practised, or from specific quality improvement applications only [4].

Conceptually, Translational Simulation aligns most clearly with improvement-focused applications, with some overlap, particularly through diagnostic and system-oriented functions, with other Simulation-Based 'T' categories, including:

Improvement: making what exists better

Identification: revealing underlying problems and issues (as described through diagnostic functions)

Influence: shaping policies, practices and culture (as reflected in some applications and subsequent literature)

The taxonomy does not seek to replace this framing; rather, it situates it within a broader classification of objective types that also encompass:

Involvement: engaging diverse and under-represented voices

Inclusion: empowering workforce participation and well-being

Innovation: introducing novel solutions and approaches

Intervention: taking action to address issues

In this respect, Translational Simulation can be understood as one functional orientation within which different applications can be situated within the wider Transformative Simulation taxonomy.

The intention of the taxonomy was explicitly stated as non-definitive and developmental, aiming to provide structure to a rapidly expanding and terminologically diverse field. As outlined in the original article, 'more and more papers [were] emerging, more terms and possible applications being generated, [and] confusion [was] mounting', with 'no one approach [capturing] all that it does and could encompass' p.2 [4]. The review therefore sought to address 'a gap in the literature in terms of a common understanding' by drawing on 'the growing global literature ... [to] recognise the breadth of work that has already been conducted and [to avoid] favour[ing] one approach' p.2 [3]. Consistent with this, our review identified 68 different terms, of which Translational Simulation was one. We therefore continue to view the taxonomy as a developmental organizing structure and welcome ongoing dialogue that strengthens clarity and alignment across related conceptual contributions.

Conceptual lineage and positioning

Transformative Simulation does not claim to originate system-level simulation practice. The purpose of the taxonomy was to organize these diverse practices and provide a shared language for differentiating simulation intentions. As described in the original article, simulation for non-pedagogical purposes had 'begun to emerge over the past decade', yet its objectives and design were 'often confused with simulation-based education methods' and shaped by 'individual institutions' needs and uses that have developed organically', p.2 [4] highlighting the need for a more coherent conceptual framing. Translational Simulation has been a contributor to that evolution [3,6-8] and referenced in the article. Our own work prior to the taxonomy was also a contributor both conceptually and empirically [9-22].

For example, earlier work conceptualized simulation as a form of co-development, where patients, clinicians and other stakeholders collaboratively shape, test and refine pathways of care through participatory design processes [12]. This framing positioned simulation as a means of generating shared insight and system-level understanding beyond traditional educational models.

Our taxonomy article explicitly sought to draw on the breadth of global literature to avoid privileging a single dominant approach and to provide an umbrella structure capable of accommodating diverse clinical, organizational and cultural simulation practices. The aim was alignment, not displacement. Transformative Simulation is explicitly cumulative rather than oppositional in its relationship to existing approaches.

Architectural distinction

The central distinction between Transformative Simulation and existing approaches to simulation for healthcare improvement and system change lies at the level of architecture rather than application.

Translational Simulation has been described as a functional approach to simulation, focusing on 'not "where?" but "why?"', and aligning simulation activity with healthcare priorities and patient outcomes [3]. Drawing on improvement methodologies such as Berwick's Plan-Do-Study-Act (PDSA) cycle, it has been conceptualized as supporting healthcare improvement through diagnostic and interventional functions, where simulation is used to 'explore performance' and to 'test and embed improvements in systems and processes' p.2 [5].

Subsequent literature has further extended the conceptualization of Translational Simulation, incorporating perspectives from design theory, human factors and ergonomics, change management and systems engineering to support its application in practice. This reflects the ongoing maturation of the field as simulation for healthcare improvement and system change continues to evolve across different contexts.

Transformative Simulation operates at a different analytical level by structuring simulation across multiple

distinct intentions rather than centring on improvement alone. It proposes:

- A taxonomy of primary simulation-based intentions (the Seven I's)
- A structured design process (4Ds)
- Explicit linkage to purpose, governance, inclusion and clinical, organizational and cultural alignment across micro, meso and macro levels.

While Translational Simulation is primarily oriented towards healthcare improvement, Transformative Simulation explicitly incorporates multiple simulation-based intentions beyond improvement as the primary organizing objective. These include, for example, identification of latent system conditions, inclusion of diverse perspectives and influence on organizational culture and behaviour. Each intention is underpinned by different theoretical traditions and requires distinct design, data capture and interpretive approaches.

In other words, Transformative Simulation is not a modality of improvement. It is an organizing architecture that enables simulation to be designed, governed and interpreted across multiple purposes, including but not limited to improvement.

Translational Simulation represents an important and influential orientation towards healthcare improvement. Transformative Simulation differentiates simulation practice across multiple intentions. It therefore operates at the level of organizing logic rather than as a single application or functional subset.

For example, a Translational Simulation approach might focus on improving a specific clinical process, such as refining a trauma pathway to reduce delays in care. In Transformative Simulation, the same simulation would be designed by first identifying the primary intention (such as improvement, identification or inclusion) and selecting an appropriate theoretical lens to guide the work. The simulation would then be structured to align design, data capture and debriefing with that intention and its associated theoretical framing, for example using improvement to optimize flow, identification to reveal latent system issues or inclusion to explore staff experience and participation in the pathway.

The taxonomy methodology

The Seven 'I's' taxonomy [4] was developed through a structured review of the literature combined with community engagement. Inclusion criteria were explicit. As outlined in the original article, the review focused on simulation 'for non-pedagogical purposes' and sought to address a 'gap in the literature in terms of a common understanding in how this is defined, described and conducted' [4]. All articles describing the use of health and social care simulation beyond pedagogical purposes were included, regardless of country, language or date. Reviews, editorials and opinion pieces were excluded because the intent was to analyse primary evidence of direct application rather than secondary commentary or debate, ensuring the taxonomy was grounded in how simulation 'is being used in practice' across diverse settings [4].

As outlined in the original article, the review sought to draw on 'primary application' literature to reflect how simulation was being used in practice across health and care systems, rather than relying on secondary commentary. This approach ensured the taxonomy was grounded in observable application rather than conceptual positioning alone [4].

The taxonomy was not presented as an ontologically pure or mutually exclusive set of categories. In complex adaptive healthcare systems, functional intentions frequently co-exist and the taxonomy differentiates by design intention rather than asserting strict ontological separation [23].

Importantly, the taxonomy has since been examined and applied across practice settings, including system redesign, workforce development and safety initiatives, for example in NHS Forth Valley, Scotland, where Transformative Simulation has been used to support system-level learning and cultural change [24,25]. Ongoing application continues to refine its clarity and boundaries. A recent study in Australia [26] aimed to understand how healthcare leaders perceive the value of simulation to identify drivers for engagement and explore how simulation activities can be aligned with leadership priorities to support quality improvement. The authors conclude that 'Many of the results in this study align with Weldon et al.'s taxonomy of simulation, which includes innovation, improvement, intervention, involvement, identification, inclusion and influence' p.7. [26] This study highlights the governing distinction of the taxonomy and its usefulness at the leadership level.

Evolution of the framework

The progression from taxonomy to applied architecture reflects standard processes in design science and implementation research, where conceptual classifications are subsequently operationalized through frameworks, processes and governance structures [27]. In this context, the Transformative Simulation framework refers to the broader architecture encompassing the taxonomy of simulation-based intentions and its associated design and application processes. The Transformative Simulation programme of work follows this trajectory, moving from descriptive categorization towards practical application in and across healthcare systems [24,25,28–31].

This evolution is developmental rather than inconsistent. Moving simulation beyond individual projects requires a framework that incorporates purposeful and ethical decision-making, clear design logic and transparent processes for accountability.

This trajectory was anticipated in the original article, which noted that the taxonomy 'is not definitive and will require further development and refinement as knowledge and understanding evolves' p.2 [4].

Format and scholarly standards

The published Key Concept infographic synthesizes previously peer-reviewed work. It does not introduce new analytical claims beyond those established in Weldon et al. [4] and subsequent publications [24,28–31]. Its purpose is accessibility and visual consolidation within the journal's Key Concept format.

Framework development merits detailed exposition, which exists in the foundational taxonomy article and related publications. The Key Concept format is designed for synthesis rather than methodological exposition. The analytical foundation resides in the 2023 peer-reviewed publication [4].

Field maturation

Healthcare simulation is now sufficiently developed to sustain multiple 'cultural or systems-oriented' simulation models and frameworks. Plurality does not equate to fragmentation. Conceptual clarity at the level of architecture strengthens cumulative science.

Transformative Simulation provides structural precision around simulation intention differentiation and governance alignment, aligning with existing system and sociological scholarship while offering an organizing lens. Ultimately, the utility of different conceptual approaches will be determined through their application in practice.

We appreciate the opportunity to clarify these points and strengthen conceptual clarity. Constructive scholarly debate strengthens conceptual clarity in emerging fields, and we welcome further dialogue through appropriate academic channels.

Sincerely,

Sharon Marie Weldon, Andy G. Buttery, Ken Spearpoint and Roger Kneebone

Declarations

Authors' contributions

Sharon Marie Weldon led the conceptualisation, drafting, and revision of the manuscript. Andy G. Buttery, Ken Spearpoint and Roger Kneebone contributed to the development, critical review, and refinement of the manuscript. All authors reviewed and approved the final version.

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Competing interests

Sharon Marie Weldon is President of the Association for Simulated Practice in Healthcare (ASPiH) and co-leads the Transformative Simulation Special Interest Group (SIG).

Andy G. Buttery co-leads the Transformative Simulation SIG.

Ken Spearpoint and Roger Kneebone declare no competing interests.

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