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The Future is Connection:

Collaboration, Creativity and Compassion in a Digital Society

Teamwork as a learning practice: A framework for teamwork education

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Teamwork drives transformative learning, fosters inclusivity and is critical for professional success. Yet, students and educators frequently struggle with it. Student experiences of teamwork vary widely across disciplines and programs, and many lack the foundational skills to collaborate effectively. Despite its importance and prevalence in assessment, teamwork education is often absent from curricula. Here we address this issue by reframing teamwork, not as a production process but as a learning practice. We introduce the Teamwork Learning Practice Framework, which is built on a natural landscape metaphor, and views teamwork as the ongoing, intrapersonal, functional, relational and reflexive processes through which people build awareness of themselves and others while working towards common goals. It positions collaboration as a means of achieving outcomes as well as a space for reflection, experimentation, and growth where people learn through and about working together within the broader structural, psychological, and relational institutional landscape. By focusing on various aspects of learning as a key element of teamwork, this framework offers a shared, consistent language across disciplines and programs, and a scaffold and practical resource for educators, program leaders, and institutions to provide the context and content for effective teamwork education. In doing so, it advances teamwork learning and practice in higher education.

Keywords: teamwork education, students, conceptual framework, learning, reflexivity, relationality

Introduction

In a world where complex challenges are becoming increasingly prevalent, teams are needed more than ever (Salas et al., 2015). Accordingly, teamwork has received increased attention as higher education responds to the growing need to prepare graduates for professional practice (Riebe et al., 2017), further intensified by the rise of artificial intelligence (AI) and digital technologies (Atchley et al., 2024). As such, our key research question is: how might we develop a guiding framework for teamwork in higher education?

There is a proliferation of models that commonly inform teamwork teaching and learning, yet were not developed to serve as a foundation for education. We categorise these models based on their underlying approaches: 1) structural and functional, such as those of Mathieu et al. (2001) and Hackman (1983), which focus on the inputs, team processes, and conditions that influence group outcomes; 2) developmental and evolution-based, comprising the works of Tuckman (1965), Gersick (1988), and Rickards and Moger (2000); 3) team member competency models, such as those of Salas et al. (2005, 2015) and Katzenbach and Smith (1993), that help better understand and identify the Knowledge, Skills, and Abilities (KSAs) relating to team leadership, performance, selection, and orientation; and, 4) models centring on team states and principles, popularised by Edmondson (1999) and Lencioni (2012, 2016), that include learning behaviours, psychological safety and dysfunction.

These models provide useful diagnostic insights that typically conceptualise teamwork in static and mechanistic ways (Kozlowski & Ilgen, 2006; Mathieu et al., 2008) yet overlook the needs of modern team structures that are more dynamic, complex and adaptive, particularly as the boundaries of teamwork extend

beyond humans to non-human actors (Atchley et al., 2024). While these models make important contributions to the conceptualisation of teamwork and team performance, they offer little explicit guidance on how to teach it, let alone the pedagogical scaffolding required for education. Taken together, this stipulates a need for a framework that provides coherence across existing models, creates a shared language and suggests a pedagogical approach for teamwork across institutions, disciplines and programs.

Addressing the fragmented nature of teamwork models and their limited application to educational contexts, this paper presents the Teamwork Learning Practice Framework (TLPF), developed to support educators in the design, delivery and scaffolding of teamwork in learning and teaching. The TLPF was developed following 22 interviews, two Co-design workshops, and 13 Community of Practice sessions with inputs from over 20 faculty and professional staff at a large Australian University in 2024 and 2025 (Ethics approval MUHREC Project ID: 34775). These discussions sought to understand how teamwork is conceptualised and taught, the opportunities and challenges experienced, and the need for a cohesive approach to teamwork in higher education. The insights gathered identified pedagogical limitations of existing models that overlooked the dynamic, experiential, and relational elements of how teamwork is conceptualised, practised, and assessed.

The TLPF contributes to educational scholarship in three ways. First, it recognises teamwork as complex and dynamic and emphasises ongoing learning and alignment with team members. It suggests a new way of understanding teamwork as a learning practice. Second, it introduces a shared language and key pedagogical principles that can be used across disciplines, as well as a "container" for teamwork guidelines, tools, and practices at the institutional, program, and subject levels. The third contribution: the TLPF is a framework that creates a holding space for other teamwork models while recognising that team dynamics continually evolve.

Teamwork as a learning practice

We define teamwork as a learning practice focused on the ongoing, intrapersonal, functional, relational, and reflexive processes through which people build awareness of themselves, others, and the team while working towards common goals. Building on that, we position teamwork as both a means of achieving outcomes and a space for reflection, experimentation, and growth, where people learn through and about working together. Through cycles of interaction, feedback, and adaptation, teams develop individual and collective capability, strengthen relationships, and cultivate the conditions for ongoing learning and innovation. Importantly, our framing of teamwork balances individual and collective learning and is a precursor to organisational learning. In line with theories of generative and dialogic organisational change (see Bushe & Marshak, 2015), social learning occurs at the individual and team level through generative dialogue, which builds momentum for social learning across teams and ultimately the organisation through ongoing dialogue and spreading of ideas.

Positioning teamwork as a learning practice becomes even more important in digital and AI-enabled environments, impacting how we practice teamwork (Yeon et al., 2025). Students are not only engaging with humans, but multiple intelligences, including AI, as part of the collaborative experience (Liang et al., 2026). Rather than viewing AI purely as a tool (Musick et al., 2021), a learning practice perspective recognises that teamwork involves working alongside intelligent systems and with others. Importantly, conceptualising teamwork as a learning practice shifts the focus beyond task completion to continuous learning and adaptation with others and technologies.

Teamwork Learning Practice Framework

To capture teamwork as a dynamic, human-centred learning practice, the TLPF employs a landscape metaphor, enabling it to move beyond static, mechanistic models. An approach inspired by nature and Indigenous ways of being, this metaphor evolved from the concept of yarning circles held on Country by Indigenous Australians, where participants are not just "in relation" with each other but the Country and landscape around them — being held in interconnection. The choice of nature as a metaphor reflects this interconnectedness and helps to convey how people come together in a shared, intentional, and considered engagement that creates the conditions for trust, dialogue, interdependence, and growth.

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Metaphor is a powerful pedagogical tool because it makes the "invisible" and relational fabric of collaboration visible, teachable, and accessible. It further serves to recall the model and attach overarching logics that also hold emotion. By providing a shared language, the metaphor allows educators and students to locate themselves within a non-linear journey of growth, rather than simply checking off prescribed behaviours or meeting isolated team outcomes. Through this natural metaphor, our framework can be understood as encompassing three key layers: the landscape, the mountains and the waterways. Figure 1 illustrates how the layers are brought together in the framework. We explain these framework layers next.

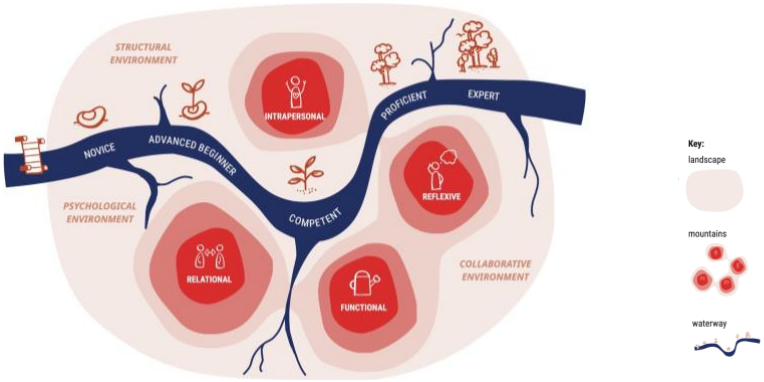


Figure 1. Teamwork Learning Practice Framework (and key)

The enabling environment (landscape)

The wider landscape represents the enabling environment that includes 1) the structural, 2) psychological, and 3) collaborative environment. Just as the landscape shapes a traveller's path, these conditions can support or constrain a team. It acknowledges that teams are situated in environments that fundamentally shape how they navigate the often messy and non-linear process of learning together and whether they flourish or not. We address each of the three environments next.

The Structural Environment includes the operational structures, processes, institutional conditions and tangible resources that impact how people function; the Psychological Environment comprises the emotional and social safety that shapes engagement and risk-taking within teams and the broader institution; and the Collaborative Environment focuses on the relational quality and ease of interactions and coordination that underpins engagement between team members and the broader systems they are operating within and alongside. Altogether, this environment either supports or constrains a team's ability to move fluidly through the intrapersonal, functional, relational, and reflexive dimensions of their teamwork practice. Further, the Enabling Environment is intentionally designed not to be constrained to a physical location or working context, acknowledging the digital, nomadic, and hybrid team environments that are commonplace in today's society.

The dimensions (mountains)

The framework is anchored by four mountains—Intrapersonal, Functional, Relational, and Reflexive—which bring perspective, structure and boundaries to the team. Mountains seldom exist in isolation; they shape and are shaped by each other and the wider terrain.

Intrapersonal dimension

Understanding oneself is arguably where teamwork begins. Before we can contribute meaningfully to a team, we need to be aware of our own values, beliefs, behaviours, mindsets, assumptions, strengths, abilities, limitations, experiences, and preferred ways of working. This dimension highlights self-awareness, self-efficacy, agency, and individual growth. It recognises that we are continuously developing as we engage in teamwork, and that we can do so intentionally and with agency.

Functional dimension

The functional dimension refers to the established ways of "doing" teamwork that enable people to work together towards shared goals. It encompasses team operations such as coordination, communication,

planning, goal setting, task allocation, conflict management, decision-making, and role clarity. While the functional dimension is necessary, it does not fully capture how teams develop, adapt, and learn, yet it gets the most scholarly attention and underpins existing teamwork models.

Relational dimension

The relational dimension is the connective heart of the framework — focusing on how people relate, trust, and grow together through collaboration as well as the culture that develops over time both in teams and eventually the broader institution. It centres on the interconnections and interpersonal dynamics of a team and is key to how teams derive their own meaning, identity, and existence — developed from how they relate to each other and the broader system they operate in. It often underpins how functional elements are enacted, shifting the focus away from independent, self-contained elements toward the interactions, processes, and contexts that bind them together.

Reflexive dimension

The reflexive dimension helps to make sense of the teamwork journey and individual and collective growth. It posits reflexivity and learning as continuous processes that extend beyond the individual team experience. It connects the intrapersonal, relational, and functional dimensions of teamwork and reiterates that teamwork is unique to each team; hence, curiosity and learning about each team are required. Teamwork tensions become learning moments rather than barriers, and reflexivity supports team members to engage iteratively, adaptively, and responsively in contemporary work contexts. This positions teamwork as a learning practice where each experience informs the next.

Journey of development (waterways)

The idiosyncratic development of teams and their members is depicted not as a destination, but as the movement and flow of waterways through the terrain. This captures the development journey of team members and teams from Novice to Expert in a way that is rarely linear. Waterways are responsive to the conditions around them; they may appear the same while being fundamentally changed by what happens in and through them. Their flow demonstrates the ever-evolving nature of the team's dynamics and growth. Grounded in established learning theories—see Dreyfus and Dreyfus (1980); Silva Magniante et al. (2021) for skill development, and Kolb (1984) for the learning process—it moves beyond a "one-size-fits-all" approach to teaching teamwork. This pathway also serves as a guide for lifelong learning, shifting the focus from simply "doing" a task to "becoming" a practitioner, identifying specific threshold concepts at each stage that transform a learner's perspective. These stages allow members to locate themselves and their peers within their practice and recognise that this can differ depending on the team they are in. It also acknowledges that teams consist of diverse members at different stages, helping move from "divide and conquer" groupwork mentalities toward a collective capability, showing that teamwork transforms both work and people.

Discussion and contributions

This paper extends our understanding of teamwork by reframing 1) how teamwork is conceptualised and practised, 2) how learning in teams occurs, and 3) how teamwork can be developed in higher education. First, deviating from the "high performance" paradigm, we position teamwork as a human-centred learning practice that encompasses both process and relationship, learning and practice. The framework explicitly foregrounds awareness and growth through practice, synthesising experiential and systems approaches to balance individual growth with organisational learning. By positioning learning, growth and human connection at the centre of teamwork, the framework offers educators a practical yet theoretically informed lens for curriculum design, assessment, and student development. It does this by providing various categories under which practical tools, outputs and activities can be developed as well as guiding graduate attributes and learning outcome development. Second, the framework draws from existing theories and models to provide a shared language and pedagogical direction across disciplines. It is intended to serve as a "platform" on which teamwork guidelines, tools, and practices at the institutional, program, and subject levels can be built. Third, where traditional models rely on linear approaches to teamwork, the framework "holds" complexity by recognising teamwork as a dynamic, complex learning practice. It provides students, educators, and teams with a coherent way to grow as teams and individuals. Additionally, the framework responds to the realities of

contemporary digital and AI-enabled teamwork environments by positioning teamwork as an adaptive learning practice that prepares students for the workplace and the diversity of teams within it.

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Sanz-Veitch, C., Van Der Kamp, M. & Ramirez, D. (2026). Teamwork as a learning practice: A framework for teamwork education. In Cochrane, T., Narayan, V., Poole, T., Lai, P., Lake, P., Moore, O., & Li, L. (Eds.), *The Future is Connection: Collaboration, Creativity and Compassion in a Digital Society*. Proceedings ASCILITE 2026. Brisbane (pp. 796–801). https://doi.org/10.65106/apubs.2026.3240

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