

Toward an Optimal Pedagogy for Teamwork

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Abstract

Teamwork and collaboration are increasingly listed as core competencies for undergraduate health professions education. Despite the clear mandate for teamwork training, the optimal method for providing that training is much less certain. In this Perspective, the authors propose a three-level classification of pedagogical approaches to teamwork training based on the presence of two key learning factors: interdependent work and explicit training in teamwork. In this classification framework, level 1—minimal team learning—is

where learners work in small groups but neither of the key learning factors is present. Level 2—implicit team learning—engages learners in interdependent learning activities but does not include an explicit focus on teamwork. Level 3—explicit team learning—creates environments where teams work interdependently toward common goals and are given explicit instruction and practice in teamwork. The authors provide examples that demonstrate each level. They then propose that the third level of team learning, explicit team learning,

represents a best practice approach in teaching teamwork, highlighting their experience with an explicit team learning course at the University of Colorado Anschutz Medical Campus. Finally, they discuss several challenges to implementing explicit team-learning-based curricula: the lack of a common teamwork model on which to anchor such a curriculum; the question of whether the knowledge, skills, and attitudes acquired during training would be transferable to the authentic clinical environment; and effectively evaluating the impact of explicit team learning.

Since the 2000 publication of the Institute of Medicine's landmark report *To Err Is Human: Building a Safer Health System*, teamwork has become a major area of focus in health care.¹ The importance of teamwork in ensuring high-quality care and reducing errors is well documented.²⁻⁴ In its review on teamwork and patient safety, the Agency for Healthcare Research and Quality concludes that team training must become "embedded ... throughout each health care provider's career."² In line with this recommendation, teamwork and collaboration are increasingly listed as core competencies for undergraduate health professions education, with the Interprofessional Education Collaborative listing teamwork and team-based care as

one of its core competency domains.³ The Liaison Committee on Medical Education now requires that a "medical education program [prepare] medical students to function collaboratively on health care teams that include health professionals from other disciplines as they provide coordinated services to patients."⁵ Other health professions' accrediting bodies have similar requirements.⁶

The mandate for teamwork training is clear, yet the optimal method for providing that training is much less certain. If teamwork training is indeed to be "embedded ... throughout each health care provider's career"² and these professionals are indeed to demonstrate competence in teamwork, then this training must begin early in a student's career and continue throughout it. Furthermore, this mandate requires that health professions educators develop effective pedagogies to foster teamwork and collaboration competencies in their students.

Defining the Challenge

Any discussion about teaching teamwork must start with definitions. Traditionally, teams are defined as groups of two or more individuals working interdependently toward a shared goal that requires coordination of effort and resources to achieve mutually desired outcomes.⁴ Teamwork, in turn, consists

of the "behaviors, cognitions, and attitudes" that make it possible to work interdependently toward a common goal.⁷

One principal challenge to developing teamwork competencies is that most established pedagogic methods do not require teamwork on the part of learners. Relying on the definitions above, we would note that most pedagogic methods fail to foster teamwork in one of the following ways: (1) students are not interdependent in their work, and (2) the curriculum does not explicitly address the knowledge, skills, and attitudes that improve team performance.

There is good evidence that exposure to these two key learning factors improves team performance. Simply placing individuals in a context where their work is necessarily interdependent with the work of another increases the frequency of behaviors associated with effective teamwork.⁸ Similarly, there are numerous examples demonstrating that training in specific teamwork models improves the performance of teams.^{6,9-12}

We assert that for students to develop competency in teamwork that is generalizable across multiple settings, their learning needs to be grounded in a model describing how individuals work effectively together in interdependent tasks. Furthermore, they need to learn

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and to practice specific skills that enable them to work effectively. Finally, the model they learn and the skills they learn and practice should be iteratively reinforced over the course of their education and training.

We propose a classification of pedagogical approaches to teamwork training based on the presence of the two key learning factors: interdependent work and explicit training in teamwork. In this classification framework, we describe three pedagogic levels of team learning and rank them relative to their impact on teamwork. The three levels are minimal team learning, implicit team learning, and explicit team learning (Table 1). We provide examples of each and propose that explicit team learning represents a best practice for developing teamwork in learners.

Level 1: Minimal Team Learning

Numerous examples of minimal team learning or traditional small-group learning exist. In some cases, this involves assigning group work such as papers and presentations to students to complete on their own. In other cases, this may involve discussion groups facilitated by the students themselves or by an instructor. These pedagogical approaches have certain strengths. For example, facilitated small-group discussions may be the best way to bring to the surface and discuss issues that are particularly sensitive.^{13,14} Similarly, facilitated small-group discussions are important when a faculty member or other facilitator is needed to provide content expertise or a senior perspective.¹⁵ In terms of developing

teamwork skills, however, these methods are not particularly strong. Assigning group projects that individuals could do at least as well, or possibly better, on their own than they could do as a group may not create an environment of interdependence and may undermine the goal of teamwork development by creating the opportunity for some group member to get a “free ride.”¹⁶ The presence of a facilitator during discussions can also reduce interdependence among team members as the facilitator often determines the pace of the session and is responsible for ensuring the participation of group members and refereeing conflicts. In an ideal team learning environment, these responsibilities would belong to the team itself. Finally, in these types of approaches, there is no explicit emphasis on teamwork as a learning goal unto itself.

Level 2: Implicit Team Learning

Implicit team learning pedagogical approaches create learning contexts in which students’ work is interdependent but which do not explicitly focus on teamwork in the manner necessary to understand and improve team performance. Examples of this level of team learning are problem-based learning (PBL) and team-based learning (TBL). Both methods are well established and described in the literature.^{17,18} PBL involves small groups of students working collaboratively to solve a problem or a succession of problems with a faculty facilitator.¹⁹ The students’ work is interdependent, but the teamwork is generally influenced by the faculty facilitator, and thus participation and

conflict resolution may not be entirely the responsibility of the team. TBL also involves small groups of students working together to solve problems, but in TBL multiple small groups are facilitated by a single facilitator, leaving the team with a greater responsibility for ensuring participation of team members and conflict resolution. Classic TBL also involves peer assessment and feedback. In comparison with minimal team learning pedagogical approaches, both PBL and TBL represent a step forward in creating learner interdependence, and evidence suggests that participation in both increases the expression of teamwork behaviors.^{20–23} Theoretically, the increased independence of the teams from the faculty leader in TBL would provide some additional advantage over PBL, but this has never been assessed. Nevertheless, neither PBL nor TBL traditionally includes an explicit focus on training in teamwork.

Level 3: Explicit Team Learning

We propose that the third level of team learning—explicit team learning—represents a best practice approach in teaching teamwork. In explicit team learning, teams work interdependently toward clear goals they share in common *and* are given explicit instruction and practice in teamwork with the goal of improving their performance. Examples of explicit instruction in teamwork include formal instruction in TeamSTEPPS (Team Strategies and Tools to Enhance Performance and Patient Safety), which has been promoted as a practical tool to enhance teamwork and improve patient safety in authentic clinical settings, or formal instruction which draws on organizational science to provide a framework for understanding and teaching how health care teams function.^{24,25} In explicit team learning, one or more of this kind of model is applied through interdependent work.

Clinical simulation for teams has been effectively used to both explicitly teach teamwork and to create interdependent learning tasks to practice and reinforce the skills being taught.^{26–29} While the most obvious learning objectives of a team simulation session may be clinical skills, such as those involved in an obstetrical delivery or a critical care event, teamwork skills are often equally emphasized. A

Table 1
Three Pedagogic Levels of Team Learning^a

Level of team learning	Examples	Presence of key learning factors	
		Interdependent work	Explicit training in teamwork
Level 1: Minimal team learning	Traditional small-group learning activities and projects	No	No
Level 2: Implicit team learning	Problem- and team-based learning	Yes	No
Level 3: Explicit team learning	Simulation (e.g., Maintenance of Certification in Anesthesia Part IV Requirement)	Yes	Yes

^aAs proposed by the authors.

specific example of simulation-based teamwork training is the Maintenance of Certification in Anesthesia Part IV Requirement, wherein anesthesiologists are asked to participate in simulation activities that include explicit instruction in and interdependent practice of both clinical and teamwork goals.²⁶

While simulation may indeed be the gold standard, and the most common current example, of explicit team learning, our classification framework suggests that there are numerous other possible pedagogical approaches that may be less resource intensive. For example, tabletop exercises, such as those presented in TBL and PBL formats where student work is fully interdependent, may present excellent opportunities for explicit teamwork instruction. Indeed, we believe an explicit focus on teamwork that begins early in a learner's career can create foundational team knowledge, skills, and attitudes. These foundational competencies can be augmented and reinforced as learners move into increasingly more complex clinical environments where these skills will be more difficult to practice but will also become much more necessary.

An example of a non-simulation-based explicit team learning pedagogical approach is the required Interprofessional Education and Development course at our home institution, the University of Colorado Anschutz Medical Campus. Over 700 students from seven health professions (medicine, nursing, pharmacy, physician assistant, physical therapy, dental medicine, and anesthesia assistant) participate in the course annually. The course covers three content domains—quality and safety; teamwork and collaboration; and values and ethics—and consists of 16 two-hour small-group sessions spread over two semesters. The course is designed in a classic TBL format, but with 5 of the 16 sessions devoted to teamwork, drawing heavily from TeamSTEPPS. Teamwork content appears explicitly early in the course but also reappears as explicit content intermittently throughout the course. With the TBL structure, each session offers the opportunity for individuals and the team as a whole to reflect on their performance as interdependent individuals and as a team. The course is designed to provide

students with foundational teamwork knowledge, skills, and attitudes, which are further developed later in training through application in simulations and clinical learning experiences.

From Theory to Practice: Challenges to Teaching Teamwork

In this Perspective, we describe three pedagogic levels of team learning based on the presence of two key learning factors: interdependent work and explicit training in teamwork. We believe these factors should be considered as important curricular design elements in teaching teamwork, and thus propose that best practice in teaching teamwork is explicit team learning, which includes both factors. Given the growing importance of teamwork in health care delivery and the sizable body of evidence indicating the dearth of these skills in practice,^{1,30} the incorporation of these key learning factors into multiple parts of the curriculum may be an optimal way to address this deficit. Furthermore, these experiences should be longitudinally integrated, accounting for the developmental needs of students as they progress from novice to mastery.

There are several challenges to developing and implementing explicit team-learning-based curricula. One challenge is the lack of a common teamwork model on which to anchor such a curriculum. However, a variety of teamwork models and curricular tools do exist for educators to draw on.^{31,32} TeamSTEPPS, a skills-based curriculum in increasingly common use, predominantly focuses on standardized language and behaviors.³³ A limitation to this approach is that TeamSTEPPS skills are most readily contextualized in acute settings, and the skills needed for less acute settings may differ.³⁴ Anchoring teamwork training in a broader theoretical model may improve a student's ability to “contextualize clinical experiences, differentiate effective and ineffective teams, and lead efforts to improve team function and overall practice.”²⁴ Which model to use will likely depend on the levels and types of learners as well as the specific skills required for their interdependent work.

A second major challenge to implementing explicit team learning is the question of whether the knowledge

and skills acquired during training would be transferable to the authentic clinical environment. Educators have far more control over the culture and context of the preclinical educational environment than they do in the clinical environments in which their students learn. Ideally, the organizations in which students work clinically would embrace the same expectations for teamwork and collaboration that educators have encouraged in students and would use the same standardized language and communications skills that educators have taught students. Unfortunately, this is not always the case.

A third challenge is effectively evaluating the impact of explicit team learning. Ideally, we would be able to assess the impact of these interventions on patient outcomes such as adverse events and quality, patient satisfaction, cost of care, and access to care; such measures would be difficult to assess and are likely to take a long time to manifest. More immediate measures of impact might include assessment of knowledge and attitudes regarding interprofessional roles and responsibilities, communication skills, and demonstrated leadership and teamwork behaviors. Simulation and multisource evaluation techniques seem particularly well suited to achieving these ends. In addition, the Association of American Medical Colleges' Core Entrustable Professional Activities for Entering Residency and the Accreditation Council for Graduate Medical Education's Milestones Outcomes Project provide opportunities to evaluate the longitudinal impact and sustainability of such interventions over time.^{35,36}

Conclusion

Developing teamwork competencies in health professions students is a goal shared by educators and health systems alike and represents both an opportunity and an imperative to create a collaboration-ready workforce. Creating explicit team learning pedagogical approaches where student work is interdependent, authentic, and engaging is challenging and represents an area of opportunity for educators. Similarly, evaluating the impact of these educational interventions on student behaviors and, more critically, on care processes and patient outcomes is a

critical next step in moving this work forward.

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