AAIM Perspectives

Reactive, Holistic, Proactive: Practical Applications of the AAIM Learning and Working Environment Conceptual Model

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Rebecca C. Jaffe, MD [a], Christina R. Bergin, MD [b], Lawrence K. Loo, MD [c], Simran Singh, MD [d], Brian Uthlaut, MD [e], Susan A. Glod, MD [f], Emily Fondhan, MD [g], Alyssa McManamon, MD [h], Sara L. Wallach, MD [i], Karen Hamad, MD [j], Katherine Walsh, MD [k], Bethany Gentilesco, MD [l]

[a] Division of Hospital Medicine, Thomas Jefferson University, Philadelphia, Pa; [b] Department of Internal Medicine, Internal Medicine Residency Program, University of Arizona College of Medicine, Phoenix; [c] Department of Medicine, Loma Linda University School of Medicine, Loma Linda, Calif; [d] Department of Medicine, Case Western Reserve University School of Medicine, Cleveland, Ohio; [e] Department of Medicine, University of Virginia, Charlottesville; [f] Department of Medicine, Penn State College of Medicine/Penn State Health, Hershey; [g] Department of Internal Medicine, Division of Medical Education, Washington University School of Medicine, St. Louis, Mo; [h] Department of Medicine, Uniformed Services University of the Health Sciences, Wright-Patterson Medical Center (Cancer Care), Wright-Patterson AFB, Ohio; [i] Department of Medicine, Hackensack Meridian School of Medicine at Seton Hall University, St. Francis Medical Center, Trenton, NJ; [j] Department of Internal Medicine, Florida State University College of Medicine, Sarasota Memorial Hospital; [k] Department of Internal Medicine, Ohio State University College of Medicine, Division of Hematology, Columbus; [l] Department of Internal Medicine, Warren Alpert Medical School of Brown University, Division of Hospitalist Medicine, The Miriam Hospital, Providence, RI.

INTRODUCTION

Medical educators are increasingly responsible for the design of the clinical learning and working environment (LWE) and for its success in achieving desired

educational and health care outcomes. Despite evolving accreditation and accountability structures outlined by governing bodies, frontline stakeholders lack tools to thoroughly analyze and improve their local LWEs.[1] Conceptual clarity, extending beyond the ivory tower and the "c-suite," is necessary before the pace of change in the LWE can accelerate.[2]

The LWE is a complex system. Within such systems, optimization strategies are unlikely to flow solely from the top down and instead are generated and enacted by empowered networks of individuals and teams.[3,4] To engage and empower all stakeholders, a successful conceptual model of the LWE should promote frontline educators, administrators, and learners as priority end-users. In a companion article, the Alliance for Academic

Internal Medicine (AAIM) presented a conceptual model of the LWE (Figure and Table 1).[5] Adoption of the AAIM LWE model is a valuable first step toward creating a shared understanding among stakeholders, facilitating discussion and communication, and providing a reference point for those seeking to approach optimization in a systematic fashion.[6] The following 3 use cases have been proposed for the AAIM LWE model:

- Reactive: Understanding the factors contributing to the current state, especially as related to a specific LWE challenge or adverse event
- Holistic: Achieving alignment among stakeholders through creation of a shared mental model
- Proactive: Designing new programs or improvement strategies at any scale

In this perspective, we explore these use cases through the presentation of 3 LWE challenges, all related to the exemplar theme of supervision within the LWE. Our aim is to demonstrate concrete methods by which application of the AAIM LWE conceptual model can propel LWE improvement, with a focus on empowering and engaging the frontline educator.

APPLICATION OF THE CONCEPTUAL MODEL

Appropriate supervision is an integral quality of an optimized LWE. Supervision refers to the dual responsibilities of a senior clinician to enhance the knowledge of a learner and to ensure the quality and safety of care delivered to each patient when learners are involved.[7-9] Accreditation standards pertaining to supervision are numerous and, at times, nuanced. Compiling a list of Liaison Committee on Medical Education (LCME), Accreditation Council for Graduate Medical Education (ACGME), Clinical Learning Environment Review (CLER), and Center for Medicare and Medicaid Services standards creates a massive checklist, daunting for any educational leader. Such a prescriptive approach is potentially deceiving, suggesting that if one could only meet each standard, then the LWE would be successfully optimized in the area of supervision. Analysis of the following challenges demonstrates an alternate approach that addresses the LWE as a whole system.

Challenge One: Reactive Application

Ralph, a second-year internal medicine resident, admits a 45-year old man with diabetes for left thigh cellulitis. When Ralph assesses the patient in the late evening, he is surprised to find the patient newly tachycardic, febrile, and experiencing progressive thigh erythema and pain. Ralph considers that this could be necrotizing fasciitis, but he decides to see how the patient responds to antibiotics. He feels reluctant to call his attending late in the evening and he does not want to call surgery for what might be an unnecessary consult. The next morning, the medical attending examines the patient and is concerned about necrotizing fasciitis. Surgery is consulted and the patient urgently goes to the operating room.

Discussion. This challenge addresses a common tension within the LWE, namely a resident's hesitancy to involve the supervising attending early in a patient's evaluation,[10] in this case resulting in a delay in appropriate care. Analysis of this event is an opportunity for the reactive application of the conceptual model. The goal of the reactive application is to systematically analyze an event or outcome and identify contributing factors. Table 1 lists possible influences in the 4 LWE domains that might have played a role in this specific LWE challenge. Using the conceptual model as a framework to broadly identify contributing factors expands the differential diagnosis for a situation in which both patient care and education could have been improved. This process of analysis is akin to using a fishbone diagram in the investigation of a medical error. Applying the LWE conceptual model to the analysis of this particular supervision challenge allows medical educators to appreciate that the easily identified personal causes pertaining to the resident are also heavily influenced by less obvious relational, curricular, and structural factors.

Considering all 4 domains ensures a broad understanding when approaching an LWE challenge. Though the 4 domains may appear static, in practice they are fluid and interconnected. Attempting to assign factors to a universally correct domain is far less important than considering how factors and domains interact and thus lead to a given event or outcome. A systems approach to LWE optimization can follow from this understanding.

Resolution. *As a result of reviewing this event, the program director implemented several corrective actions. Core faculty were engaged to develop a set of shared expectations for communication across the hierarchy of the care team. The resulting adoption of the SUPERB/SAFETY model included criteria that the attending be called for any concerning changes in a patient's clinical status or if the resident feels uncertain regarding diagnosis or management.[11] Faculty and residents participated in a joint training session on the new model that emphasized diagnostic uncertainty as a*

PERSPECTIVES VIEWPOINTS

- A novel conceptual model for the clinical Learning and Working Environment (LWE) has been adopted by the Alliance for Academic Internal Medicine, consisting of four nested domains Personal, Relational, Curricular, and Structural.
- The model can be applied reactively, holistically, and proactively with the purpose of LWE improvement.
- Understanding the reactive, holistic, and proactive applications for this model permits frontline educators and clinicians to leverage it to optimize their unique local LWE.
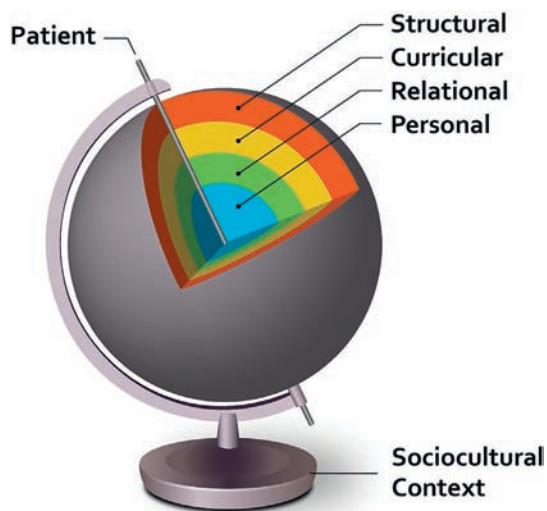
Figure The Alliance for Academic Internal Medicine Learning and Working Environment (LWE) conceptual model in visual form. The Learning and Working Environment is the nesting of personal, relational, curricular, and structural domains as traversed by multiple learners, centered on the needs of individuals or populations of patients, and influenced by the sociocultural context. Domain characteristics with examples for inquiry are presented in Table 1.

"red flag," prompting a resident to call for guidance.[12] *A simulation introduced the SBAR (Situation, Background, Assessment, Recommendation) mnemonic as a framework for overnight calls.*[13,14] *The joint training sessions were designed to address elements of the hidden curriculum and increase the receptiveness of faculty to resident calls. A printable*

version of the expectations for calls was incorporated in the shared sign-out document as a point-of-care reminder. The program director further plans to examine the feasibility of engaging hospitalists to staff overnight admissions.

Challenge Two: Holistic Application

Noah is a clerkship director for a medical school in a rural setting. To accommodate all of his learners, he must coordinate with a range of different clinical sites. Some of the sites are relatively new and are still working to establish effective practices around medical student teaching and supervision. He has received concerning feedback about one site, where students tell him that they are not permitted to interact with patients independently and spend the majority of their time shadowing.

Noah discusses this feedback directly with the site director, Maria. Maria agrees that students need more autonomy to learn, but she expresses that her site is under tight production pressures that limit the faculty's time and ability to teach. Noah and Maria recognize their competing priorities and they are not sure how to proceed.

Discussion. This challenge focuses on optimizing the LWE for undergraduate medical learners and presents an opportunity for the holistic application of the conceptual model. Table 2 lists elements in the LWE that may influence successful LWE optimization as well as shared goals in the 4 domains which, when identified, may improve alignment. The goal of a holistic strategy is to construct a shared mental model of the LWE, allowing stakeholders with diverging or conflicting priorities to communicate and collaborate more effectively on opportunities for improvement.[15,16] Without a shared mental model, one

Table 1 Definitions of the four domains of the LWE, with example inquiries within each domain. See Figure for an illustration of the four domains.

Domain	Definition	Example Inquiries
Personal	The lens through which a learner experiences the LWE and the set of intrinsic qualities the learner adds to the LWE. Includes the learners self-identification and the attitudes, biases, skills, experiences and vulnerabilities they possess.	• What is the learning style of a medical student or group of students? • How skilled is a resident with kinesthetic tasks? • What is an attending's personal or cultural comfort with autonomy?
Relational	The ways in which individuals or groups interact and the impact of these interactions upon learners and the LWE as a system. Interactions between peers, staff, patients, supervisors, mentors, educators, and personal relationships (e.g., friends, family) are to be considered. This domain encompasses unique relationships as well as LWE culture and behavioral norms.	• Do educators create a safe environment for learners to ask for help? • Is the learner's role on the team clear to patients and providers? • Is social isolation prevalent for a learner or group of learners?
Curricular	Factors relating to formal and informal educational experiences consisting of at least one learning objective and a process of learner assessment and feedback, even if not overtly stated. The hidden curriculum is also part of this domain, though overlaps significantly with the other three domains.	• Does didactic content match the needs of learners and patients? • Are efforts made to create interprofessional learning experiences? • Are ample faculty development opportunities available for educators?
Structural	The organizational, programmatic and physical context within which clinical learning occurs. Components may be specific to the local LWE - such as workspace, the electronic medical record, staffing levels, team structures, and institutional policies or may be externally defined such as work hours, admitting caps, or licensure requirements.	• Are work areas in proximity to patient care areas? • Is the ambulatory schedule conducive to patient panel continuity? • Is there sufficient infrastructure to minimize non-physician tasks?

can imagine individuals in the roles of clerkship director and clinic medical director approaching the presented situation with discordant aims.[17] They may feel individually beset by external pressures, such as LCME standards for the clerkship director or inflexible clinical schedules for the site director. Achieving educational and clinical alignment within such rigid parameters presents a significant but not unfamiliar challenge. The aim of the holistic use case is not necessarily the development of an action plan or concrete solution, but rather the development of a common understanding.

The 4 domains again contribute to the creation of this shared understanding, but other elements of the model may have more power in this setting. Reestablishing a focus on the patient and patient care and acknowledging the existence and needs of multiple learners (eg, medical students, residents, faculty, and allied health professionals[2]) is especially impactful when stakeholders seem to have discordant aims.

Resolution. *Maria and Noah decide that a site visit will help Noah better understand local challenges and opportunities for improvement. They use the conceptual model to identify their common goals in each of the 4 domains and focus their conversation on the needs of the clinic's patient population. Noah tours the clinic, surveying the existing structural resources and meeting with the physicians and nurse practitioners. At the end of the visit, Noah and Maria feel they better understand each other's assets and needs, and they commit to staying in close contact as they work to optimize the clinic's LWE. At the end of the following rotation block, the reviews of the rotation at Maria's clinic are much improved. Maria explains to Noah that she has created a workflow in which students meet their patients in the waiting room and perform triage vitals and intake, then accompany them to phlebotomy after the visit. Students appreciate the increased time spent with individual patients, practicing hands-on skills, and building relationships with interprofessional staff. Providers found the added time between precepting learners invaluable for efficient workflow.*

Challenge Three: Proactive Application

Anjali is a new designated institutional official (DIO) at an academic health center. As part of a needs assessment, she has been meeting with educational and clinical leaders across professions, and she has closely reviewed the ACGME CLER Pathways to Excellence. She notes a pathway specifying that "clinical staff members other than physicians play an active role in ensuring that supervision policies and procedures are followed."[18] Anjali is interested in improving the institution's approach to learner supervision and believes that creating a culture of interprofessional collaboration is an important area for development.

The C-suite leadership will be at the Sponsoring Institution's Clinical Learning Environment Committee meeting in 1 month. Anjali has identified procedural supervision, especially for bedside procedures, as an area that will particularly benefit from increased supervision and interprofessional involvement. She wants to pitch a proposal at the upcoming meeting.

Discussion. This challenge illustrates the potential for proactive application of the LWE conceptual model, incorporating all 4 domains in program design. Table 3 presents elements in each of the LWE domains specific to this scenario. Similar to the holistic application, this process seeks to align stakeholders and create a shared vision. However, in the proactive use-case the focus extends beyond achieving alignment to the intentional design and implementation of a program or optimization strategy. This process is guided by questions such as "What changes in a given domain do we hope to achieve?" and "What factors in a given domain will be necessary to ensure program success?"

By considering elements in all 4 domains in advance, maintaining a focus on the patient, and accounting for the needs of a multitude of learners, Anjali can design

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Table 2 Reactive Use of the Conceptual Model of the Learning and Working Environment as Applied to Supervision[*]

DOMAIN	CASE 1 EXEMPLAR FACTORS
Personal	GME Learner: Medical knowledge; Clinical reasoning and judgement; Insight into own skills; Management of competing priorities; Threshold to ask for help; Fatigue Attending: Understanding of supervisory role; Attitude towards learner autonomy; Receptiveness to calls at night; Balance of burnout and engagement
Relational	Clarity of expectations regarding overnight calls; Handoff between day and night team; Collegiality between departments; Resident-patient interaction
Curricular	Didactic content; Explicit clinical reasoning curricula; Faculty development in medical education; Team training; Hidden curriculum rewarding independence
Structural	Admitting caps; Shift length; Overnight staffing; Policies, bylaws, rules regarding supervision; Geographic distribution of patients; Implementation of work hours

GME = graduate medical education.

 * Exemplar factors within the 4 domains contributing to the situation described in case 1. This list is not exhaustive nor are domain assignments absolute. The table demonstrates the range of contributing factors that could be targeted when optimizing the learning and working environment in a reactive fashion.

Table 3 Holistic Use of the Conceptual Model of the Learning and Working Environment as Applied to Supervision*

DOMAIN	CASE 2 EXEMPLAR FACTORS
Personal	Clinical/Educational Leadership: Ability to appreciate competing priorities; Leadership skills; Receptiveness to feedback. Clinic Attendings: Desire for joy in practice; Role clarity; Mastery of effective teaching strategies; Interest in teaching; Management of competing priorities; Wellness/burnout. UME Learners: Desire for joy in learning; Role clarity; Attitudes towards autonomy; Clinical knowledge/skills
Relational	Shared expectations between clerkship director and stakeholders; Openness of communication between site director and clerkship director; Clinic team composition and culture; Trust between patients, providers, and students; Provider receptiveness to student questions
Curricular	Development of achievable competencies mapped to rotation; Availability of faculty development addressing medical education proficiencies; Quality of clinic orientation; Expectations/formats for self-directed learning; Preclinical courses building value-added skills (Motivational interviewing, Vital sign measurement)
Structural	Ratios of clinical and administrative staff; Site resources including workstations, conference rooms, number of patient rooms; Student EHR access; Provider-Patient schedule; Patient rooming workflows

UME = undergraduate medical education; EHR = electronic health record.

* Exemplar factors within the 4 domains contributing to the situation described in case 2. This is not an exhaustive list, nor are domain assignments absolute. The table demonstrates the range of contributing factors that could be targeted when optimizing the Learning and Working Environment in a holistic fashion.

a program that has a higher likelihood of success. An analogy might be to a SWOT analysis, in which internal strengths and weaknesses and external opportunities and threats are identified before proceeding with a program for improvement.[19] Within each domain, the DIO can identify readily available assets that will lend to programmatic success. She can also identify areas where internal resources may be lacking, leading to informed requests for support, and program design to circumvent these potential barriers. When considering external opportunities and threats, Anjali is accounting for the sociocultural context that exists outside of, but

influences, the LWE. For example, the CLER process is not a part of the LWE, but in this case there is an opportunity to leverage a CLER pathway for increased buy-in from institutional stakeholders.

Resolution. *Anjali drafts a proposal for bedside procedure excellence. She outlines specific interprofessional bedside workflows, a plan for interprofessional team training, and integration of a procedure portal within the LWE. She proposes initial implementation in intensive care units due to the large volume of high-risk procedures performed and the high nurse-to-patient ratio—a structural factor that will support an early pilot. She plans to*

Table 4 Proactive Use of the Conceptual Model of the Learning and Working Environment as Applied to Supervision

DOMAIN	CASE 3 EXEMPLAR FACTORS
Personal	GME Learners Medical knowledge; Procedural skill; Attitudes towards IPE[20]; Understanding the skills and responsibilities of team members; Receptiveness to feedback; Empathy; Regard for patient safety principles Other Health Professionals Work experience; Procedural experience; Perceptions of hierarchies; Comfort with speaking up; Ability to manage competing responsibilities and workload; Knowledge of institutional policies SI Leadership Commitment to education
Relational	Culture of respect across professions; Dynamic between professions at the bedside; Staff/learner report with supervisors; Shared understanding of roles pertaining to invasive procedures; Faculty/staff modeling of teamwork behaviors; Effectiveness of collaboration between professions at leadership level
Curricular	Procedural skills training program; Hidden curriculum pertaining to IPE; Integration of SI policies into curricula; Explicit team training; Unit onboarding process; Establishment of learning objectives pertaining to invasive bedside procedures; Incorporation of validated teamwork assessment strategies[21]; Curricular integration at the point of care
Structural	Nurse/patient ratios; Documentation burden; Size and layout of patient rooms; Location of workspaces and proximity to patient care areas; Integration of procedure tracking portal; SI clinical reference guide; Number of point-of-care ultrasounds; Availability of simulation facilities

IPE = interprofessional practice and education; SI = sponsoring institution.

Exemplar factors within the 4 domains contributing to the situation described in case 3. This is not an exhaustive list, nor are domain assignments absolute. The table demonstrates the range of contributing factors that could be targeted when optimizing the LWE in a proactive fashion.

measure patient safety culture survey data in the intervention units and rates of procedural complications, metrics recently added to the hospital's balanced score card for patient safety and quality improvement. Her proposal was well received by the Clinical Learning Environment Committee; her requests for a nurse co-lead for the program and information technology support were granted.

CONCLUSION

These challenges demonstrate 3 potential use cases for the application of the AAIM conceptual model of the LWE. Exemplar challenges were designed to highlight several different contexts within the LWE, including an inpatient challenge focusing on the needs and actions of a single graduate medical education learner, an ambulatory challenge focusing on a group of undergraduate medical education leaders and local leadership, and health system level challenge incorporating interprofessional collaboration and senior leadership. The LWE conceptual model appears to be applicable and stable across these various contexts. The 3 use cases presented (reactive, holistic, and proactive) can be applied at any scale, extending from a single learner or team to an entire program or sponsoring institution. It is the hope of the authors that additional use cases of the model will arise, along with tools incorporating the model into existing LWE optimization infrastructures.

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