

STUDYING LEARNING IN ACTION: A SCOPING REVIEW AND CROSS-DISCIPLINARY DISCUSSION OF CONCEPTUALIZING LEARNING IN EMERGENCY MANAGEMENT AND HOMELAND SECURITY EDUCATION

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ABSTRACT

Theory is an integral component of emergency management/homeland security (EMHS) higher education curricula. Professors of EMHS employ theories that help describe, prescribe, explain, and predict the outcomes of phenomena and processes. In addition to practical theories, EMHS professors employ learning theories that address the teaching and learning processes. This article identifies ways learning is studied and researched in EMHS education and connects that learning and research to the field. A cross-disciplinary scoping review examines three approaches to higher education EMHS higher education teaching and learning.

Keywords: *Scholarship of Teaching and Learning (SoTL); emergency management/homeland security education; learning sciences*

INTRODUCTION

As academics and professors of emergency management/homeland security (EMHS) plan for and teach their students about the theories of EMHS in practice, they also apply theories of learning and education. These learning theories have assumptions about what knowledge is, how that knowledge develops and is learned, and why some knowledge is more critical to EMHS. The author presents several approaches to studying learning in action as a means for researching what is learned and how that learning occurs.

Feldmann-Jensen et al. (2019b) extend Peek's (2006) call for research on the nature of learning in EMHS, specifically through the avenue of the scholarship of teaching and learning (SoTL). Their analysis of the learning process and educational experiences identifies a need for systematic research into EMHS education to understand better how learning happens and the kinds of experiences that elicit learning. Utilizing interdisciplinary research concepts and methods of learning while focusing on EMHS learning spaces will expand the body of knowledge. Recent EMHS education research sheds light on core skills and content knowledge (Carlson & Little, 2019; Feldmann-Jensen et al., 2019a; Shannon et al., 2023), experiential and service learning (Bergeron, 2019; Carey, 2018; Pellegrino, 2022), online learning (Aydiner & Buhler, 2023; Towner & Cozine, 2023), the impact of the COVID-19 pandemic on learning (Allred et al., 2021) and program structures (Larrañaga, 2020) on the multitude of ways that EMHS students are taught and learn.

The author answers Feldmann-Jensen et al.'s (2019b) call for advances in EMHS-SoTL. This article leverages learning sciences concepts (Fischer et al., 2018) to unpack learning methods across various spaces and activities, from informal learning to organizational and design learning. Learning science scholars identified many avenues for approaching and conceptualizing learning, from individual cognitive to socio-cultural processes (Hoadley, 2018; Kolodner, 2018). The learning sciences expand the notion of learning and how learning occurs and should be equitable and cross-culturally relevant (Nasir et al., 2021).

SCOPING REVIEW FOR STUDYING LEARNING IN ACTION

Like other professional fields, EMHS has a journal for advancing teaching and learning scholarship: the *Journal of Security, Intelligence, and Resilience Education* (JSIRE). This author employed a *scoping review* that identified three (3) JSIRE articles (Table 1.) that exemplify current EMHS pedagogy/andragogy and learning epistemologies. A scoping review (Munn et al., 2018; Striepe & Cunningham, 2022) provides a map of knowledge gaps, concepts, and potential research avenues for a particular topic.

This article connects experiential learning with embodied cognition, team-based learning with ways of participation, and online learning with collective knowledge construction. Studying learning in action includes collecting and analyzing verbal, physical, and virtual interactions as they occur. The process helps us understand how knowledge, skills, practices, and values develop and how these phenomena transfer to the field. In other words, learning in action, or knowledge in use, “concerns how we might go about locating and studying knowledge in the practical activities of people engaged together, accountably, in social and technical practices.” (Hall & Stevens, 2016, p. 75) and how those practices develop and change over short and long periods. By studying students' practical activities, learning in action opens the door to learning beyond traditional rote memorization. For example, the physical movement of students during learning activities, such as engaging with particular artifacts or technologies, demonstrates their learning over time as their interactions change. These practices are embedded in social, cultural, and ethnic frames of knowledge and practices (Towner & Cozine, 2023) that influence how students participate. Some students may develop practices that open (or close) “access” to all or some team members through group learning. “Access” influences what knowledge is used or valued within the group. Online tools such as discussion boards, shared documents, and video conferencing provide greater access and enhance learning processes.

Table 1. Selected EMHS education research articles for scoping review in connection with learning science concepts.

EMHS Education Research	Brief Description	Concept of Learning	Brief Description	Example Citations	EMHS Related Questions
Danko (2020)	Is experiential learning impactful on student learning?	Embodied Cognition	Communication of learning and meaning-making through body movement and interactions.	Alibali & Nathan (2012) Alibali & Nathan (2018) Azevedo & Mann (2018) Hollett et al. (2022) Price et al. (2016)	How are students physically interacting with each other and the material during a simulation, case study, exercise, etc.? How are they using their bodies to represent concepts for discussion and learning as moments that demonstrate their developing learning? How are learners using their bodies in conscious and unconscious means of increasing or decreasing access to materials? How does observing each other's actions activate embodied knowledge whereby a learner may mentally imitate an external physical action and learning?
Shannon (2020)	Is team-based learning impactful on developing student critical thinking?	Ways of Participation	Learning as the development of social interactions and dynamics in a group.	Borge et al. (2020) Crowley & Jacobs (2002) Hod & Teasley (2021) Lave & Wenger (1991) Ludvigsen & Nerland (2018) Nguyen et al. (2021) Stahl & Hakkarainen (2021)	Are there different ways of participating that have developed based on the heterogeneity or homogeneity of each group? What would learning look like if each team had only a piece of the problem to work on? How do teams create ways of participating and engaging across the problem? How do teams create ways of participating differently in person compared with online? How do EMHS student groups empower and disempower each other in tabletop exercises?
Pennington (2020)	How did the shift to online classes impact traditional classes and special activities such as internships?	Collective Knowledge Construction	The simultaneous co-development of both individual content and skill knowledge and social systems, or the ways of interacting and participating through the use of specific content knowledge and practices	Bielaczyc (2006) Bielaczyc et al. (2013) Cress & Kimmerle (2018) Ley et al. (2020) Muhonen et al. (2017) Rodríguez-Triana et al. (2020)	Did the students co-create reports, designs, or websites? How did online collaboration influence the students' appropriation of knowledge while living through a pandemic? How did the triangulation of daily life, virtual internships, and online class collaboration influence how students understand EMHS concepts and skills and develop their identities as future practitioners? What kinds of interactions were or were not available through online modalities?

CONCEPTS FOR STUDYING LEARNING IN ACTION

This section discusses Danko's (2020) experiential learning, Shannon's (2020) team-based learning, and Pennington's (2020) online learning. They examine learning science concepts including embodied cognition, participatory methods, and collective knowledge construction as innovative lenses for studying learning in future research (Table 1).

Experiential Learning and Embodied Cognition

The first concept of learning in action discussed here is experiential/hands-on learning.¹ Experiential learning exemplifies embodied cognition. Specifically, experiential learning captures how people physically communicate and make sense of their environments. Physical movements can be as small as pointing a finger or as large as physically moving oneself in relation to others (Hollett et al., 2022). From a cognitivist perspective, embodiment engages motor and perceptual neural pathways for a whole-body conceptual understanding of the topic. From a socio-cultural approach, embodied cognition connects to social dynamics within a group, such as access to materials and value in contribution. Furthermore, some scholars (Alibali & Nathan, 2012; Price et al., 2016) found that embodiment creates a public resource for thinking whereby future learners are impacted by how an artifact is designed. This physicalness of thinking through embodiment gives all learners a way to see and experience the concept, which discussions alone may lack.

Learning with and through movement implies that learning occurs with experiences. Danko (2020) presents the results of a study on experiential learning and its impact on EMHS student learning gains related to complex problem-solving. She uses the term “experiential” explicitly to describe the concept of learning studied in this article. Danko frames experiential learning through the transformative nature of learning by doing and experiences. Students develop critical thinking skills, comprehension of the domain of knowledge, and satisfaction with learning in experiential learning situations, such as case-based learning. To understand learning, Danko surveyed a particular EMHS program at one U.S. university for indicators of experiential learning across the various courses and students’ perceptions of those situations. The survey found that “when asked to consider experiential learning activities such as case studies and simulations as class activities, students perceived statistically significant strong learning gains in their understanding of the relevance of information and research to real-world issues.” (p.21) This finding leads to interesting questions about the nature of learning in case studies and simulations: *What about the case studies and simulations that promoted these perceptions of substantial learning gains? What makes these activities different from participating in discussions or other group work?* There is a unique interaction between learners, their peers, and the materials that require a more intensive inter-relational engagement.

¹ EMHS education literature uses the term “experiential” in loose and tight ways, such as referring specifically to internships or apprenticeships or generally to any hands-on activity including tabletops (see Dowd, 2022). This is another opportunity for furthering SoTL by determining how this kind of term should be used in publications. Should this term have a specific meaning of learning activities, or should it encompass a large family of resemblances?

Azevedo and Mann (2018) found that amateur astronomers create informal learning spaces and use physical touch for discussion and teaching each other. They depict how a person physically embodies their thinking of viewing constellations by drawing on the back of another person looking through a telescope (Figure 2, p. 96). The person viewing phenomena through the telescope interprets their cognitive experiences, enabling shared sensemaking. Beyond physical representations of concepts, they found averted vision to be an alternate way of learning, whereby a viewer looks at an object from an angle rather than straight on, which is unnatural to human sight, to see faint objects. More than just interacting with each other, embodied cognition makes sense of how we position our bodies to content and materials.

In another example of embodied cognition literature, Alibali and Nathan (2018) found that embodied cognition can also represent “off-loading” learning into the physical space. Individuals use cultural tools and artifacts to distribute their thinking and learning to objects (e.g., calculators, checklists). How objects are designed and interacted with represents how learners make sense of information, ultimately learning. For example, forms and online tools used when preparing for, responding to, recovering from, and mitigating a disaster or crisis embody which knowledge is essential and how professionals “off-load” certain thinking into the artifacts for faster or more consistent practices.

Utilizing Danko’s (2020) research as a launch point, embodied cognition provides a lens for making sense of physical activity and interaction within a learning space. In this way, a researcher could ask: *How are students physically interacting with each other and the material during a simulation, case study, exercise? How are they using their bodies to represent concepts for discussion and learning as moments demonstrating their developing learning? How are learners using their bodies in conscious and unconscious means of increasing or decreasing access to materials? How does observing each other’s actions activate embodied knowledge whereby learners may mentally imitate an external physical activity and learning?*

A potential research study could record a group discussion of a tabletop exercise. By transcribing the verbal and physical interactions between the students and the physical materials, a researcher could look for how the students use gestures and interact with physical spaces to demonstrate their thinking to the group. As time progresses, these physical movements may shift throughout the activity. This change in the kinds of movements demonstrates learning as a development through the embodied cognition of the student participants.

Team-Based Learning

The second concept of learning this paper discusses is team-based learning as an entry point for understanding learning as developing ways of participation. Learning is not singularly about the course content or skill acquisition. The participants initially bring social practices into a group that changes over time as a form of social learning (Hall & Stevens, 2016). Indeed, ways of participating within and across groups is a form of learning (Hod & Teasley, 2021; Lave & Wenger, 1991). Learning as a way of participating shifts the unit of analysis from individual to

group learning (Crowley & Jacobs, 2002; Stahl & Hakkarainen, 2021). How groups learn and develop as members participate and interact with each other is a form of learning in action (Ludvigsen & Nerland, 2018).

Shannon's (2020) team-based learning (TBL) model approach to teaching and learning critical thinking employed Sweet and Michaelson's (2012) definition of team-based learning, "a specific sequence of activities and feedback designed to change groups of individual students into high-performance learning teams quickly." Shannon's TBL model uses strategies such as readiness tests to structure teamwork so that all learners are positively engaged in the experience. She found that TBL increased performance on a successive writing assignment that required critical thinking skills.

Regarding group dynamics, Shannon (2020) pointed out the opportunities and challenges of heterogeneous or homogeneous groups. In cited literature, diverse teams were less effective in identifying the correct problems and solutions than homogenous teams. However, the more diverse teams provided more perspectives and solutions over time (Watson et al., 1993). Although Shannon did not report anything about group diversity nor if differences were found, this difference provides potential for future research: *How did team members interact and create ways of engaging within the structure of the TBL model?* Knowing that these learners, if going into the EMHS field, will likely be working on teams in their future careers, *how does participating in these classroom team activities develop their identities and future participation on other teams?*

Nguyen et al. (2021) studied the group learning of pairs of rapid water canoers. They focused on how the teams discussed upcoming rapids on a river, using representations such as laying out rocks and how they would navigate through them. In one anecdote, Nguyen et al. (2021), two canoers crouched with others behind them, and one presented their thinking (plans) through hand gestures. The crouched people were close to the rock formation and could provide greater visibility to the canoers following them by not blocking their view with their upper bodies. Their interactions demonstrate that the process provided all participants with enhanced situational awareness.

Later, Nguyen et al. (2021) analyzed the interaction between a pair of canoers and a marshal standing on a rock in the rapids. The canoers engaged with the marshal because the marshal had a better view than they did. The marshal's positioning on the rock gave them certain rights and responsibilities when they yelled instructions, "Hard left! Draw! Draw!" (p. 561). In addition to this interaction, the canoers accepted the marshal's guidance by following her directions. This case exemplifies how EMHS education can learn from collaborative exercises.

Future research directions using the concept of ways of participation and Shannon's (2020) research could focus on the interactions specifically within and across teams (Borge et al., 2020). *Are there different ways of participating that have developed based on the heterogeneity or homogeneity of each group?* The TBL model Shannon (2020) presented forced teams to offer

solutions simultaneously. In a different context, a researcher may ask, *what would learning look like if each team had only a piece of the problem to work on? How do teams create ways of participating and engaging across the problem? How do teams develop ways of participating differently in person than online?* Moreover, critical research questions may incorporate analysis of power and positioning: *How do EMHS student groups empower and disempower each other in tabletop exercises?*

A potential research study could examine how student–student interactions change throughout a long project. Collecting data on these interactions, such as through audio-video recordings of student-student interactions, might allow researchers to identify patterns or interruptions in how students interact with each other and the materials. Furthermore, collecting individual artifacts, such as student reflections at the end of each class, might provide insights into how students may think about their group interactions.

Online Learning and Collective Knowledge Construction

The last concept of learning is collective knowledge construction and its study in online learning spaces. Collective knowledge building is the simultaneous co-development of individual content or skill knowledge and social systems (Bielaczyc et al., 2013). In other words, collective knowledge building is interacting and participating through specific content knowledge and practices. The collaboration context influences this content and participation learning (Bielaczyc, 2006). Similarly, the developing social systems are impacted by the tools used or accessed, whereby some ways of interacting may or may not be available. Learning management and other IT platforms such as Canvas, Google Docs, and WebEOC shape how collaborators use and represent knowledge, influencing interactions between people and content.

Like most colleges and universities, due to COVID-19, Pierce College shifted to online platforms, which required navigating various student requirements and benefits. The College developed and implemented a new special topics course on pandemic planning and virtual internships across multiple levels and sectors of EMHS work (Pennington, 2020). The redesign of the EMHS programs due to the pandemic also provided new mentorship opportunities between bachelor’s and associate’s students (Pennington, 2020). Pierce College students, balancing working internships with class loads, had to navigate two different responses and systems. These institutional collaborations allowed students to share information and truly build knowledge at a time when anxiety was high from a lack of understanding.

Like ways of participating, learning can be studied amongst individuals through the materials or knowledge they create in a partnership (Muhonen et al., 2017). “In knowledge construction, individuals do not merely contribute additively but refer to each other and take up each other’s arguments so that the group may arrive at new insights.” (Cress & Kimmerle, 2018, p. 137) Collective knowledge construction forms ways for learners to combine pieces of information, negotiate an understanding of that information, and embed it into a new frame (Greenberg et al., 2020). Researchers study collective knowledge construction in-person and online, especially

with the advancements of sophisticated online tools. For example, Rodríguez-Triana et al. (2020) studied how teachers shared and developed inquiry-based learning practices through sharing, discussing, and reflecting on learning designs in an asynchronous online tool. The researchers were interested in understanding how the teachers internalized and appropriated this knowledge through collaborative practices in the online space (Rodríguez-Triana et al., 2020). The authors used the knowledge appropriation model (Ley et al., 2020) to understand the interactions of individuals within the online space for applying knowledge.

Pierce College's partnering activities are a potential model case study of how EMHS students create knowledge and develop social systems. Based on these theories, questions researchers could consider are: *Did the students co-create reports, designs, or websites? How did online collaboration influence the students' appropriation of knowledge while living through a pandemic? How did the triangulation of daily life, virtual internships, and online class collaboration influence how students understand EMHS concepts and skills and develop their identities as future practitioners? What kinds of interactions were or were not available through online modalities?*

Future studies may look at how students build on each other's arguments or discussion points in an online discussion space. Through collecting data from student discussion posts, a researcher can map how a student uses the features of a particular technology (such as replying versus referring to another student by name) to agree with or disagree with a classmate. In addition to how students call on each other, this study would see how they may weave in their personal experiences, learning in this particular course or other courses, and beliefs, values, and even emotions to develop a shared understanding of the topic under study. Results from this study would contribute to how online learning spaces for EMHS education are developed and implemented.

CONCLUSION

In studying learning in action for putting the theory of teaching into practice, this paper examined three approaches to learning for future EMHS education research. Experiential learning-embodied cognition is one way to study the physical demonstration of learning, such as interacting with others and things during a learning experience. Team-based learning and ways of participation shift the focus from individual to group learning to study learning and developing social practices. Online learning opens innumerable apertures for collective knowledge sharing and collaboration. The Scholarship for Teaching and Learning (SoTL) in EMHS is a growing avenue of research and practice. Experiential learning, team-based learning, and online learning platforms are integral components of the SoTL and should be leveraged to advance the field and save lives and property.

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