Situated Cognition Foundations


This article is widely cited. In the first half of the article, the authors demonstrate the situative nature of learning and the problem with school learning. They argue that knowledge acquisition cannot be separated from doing and that just plain folks solve problems within the contexts and frameworks that created them using the tools that these specific contexts and frameworks provide. Knowledge acquisition is therefore a process of enculturation and as we gain knowledge we constantly change through a process of enrichment. During the second half of the article, two different approaches to mathematics instruction at the university and grade 4 level are analyzed. They advocate teaching knowledge like teaching a tool through an apprenticeship approach. They recommend embedding learning in a familiar activity which allows for legitimacy of the student’s implicit knowledge as well as allowing for collaboratively generated solution paths.


Hutchins uses cognitive anthropology to locate the cognitive activity of naval navigators within their dynamic context, or ‘in the wild.’ He coins the phrase distributed cognition to describe how the navigation team creates knowing that is greater than the individual parts. He documents how physical space, social space, and tools create cognition across the team as well as integrate the novice into practice. He provides an excellent, detailed description on how our tools are embedded with historical cognition.


Through their reflection on anthropological research on apprenticeship and their own teaching practices, Lave and Wenger theorize on how the novice participates and learns in the workplace. They coined the concept of learning within a community of practice that affords legitimate peripheral participation to the novice to facilitate full participation. “Learning occurs through centripetal participation in the learning curriculum of the ambient community” (p. 100). They briefly acknowledge how political, economic, and cultural structures will impact learning in a community of practice. They provide examples of how communities of practice can encourage or block learning.

A comprehensive text describing the antecedents, conceptual foundations, and empirical research developments in situated cognition. The first 181 pages provide a range of chapters that explain the field of situated cognition. The final section describes 16 different developments in situated cognition, including “Situativity and Learning” (Sawyer & Greeno) and “Problem Solving and Situated Cognition” (Kirsch). These chapters provide in-depth descriptions of the current and future research trends in these areas. A must read for those individuals wanting to study situated cognition at the theoretical level.

**The Situated Approach to Didactic Learning**


This paper details the administration of a community project assignment that situates social work students in the community in order to examine their own privilege and learn about oppression. This project bridges the local social issues with theory while supporting the student as they enter practice. Additional benefits of this project are that students increase their engagement with their classmates and instructors while building a professional network within the community. The instructors have identified and mapped the critical learning moments in the project. Authentic assessments have been created to support individual and systems change. The challenges of individual student trajectories becomes problematic within the linear, 15-week semester and community groups have expressed frustration with the project terminating unnaturally with the end of the semester. They acknowledge the need for faculty development in the arena of “active and collaborative teaching and learning methods” (p. 62).


Fourteen articles that included 1037 subjects (students and clinicians) were included in a meta-analysis of situated e-learning activities in medical and nursing education. They defined situated e-learning as “a computer-assisted educational program constructed with simulated situations, scenarios-based, or case-based learning activities” (p. 175). They found that situated e-learning significantly enhanced novice performance over traditional classroom activities, but not knowledge acquisition. Situated e-learning did not demonstrate any benefits for improving clinician performance over traditional classroom activities.

This paper notes that a significant amount of knowledge and skills that are learned in the classroom are not used in job situations. They briefly describe 3 studies that support the concept that situated learning improves learning and motivation. They compile a list of recommendations from a number of researchers that they use to design a situated learning curriculum on psychopathology. This list includes providing authentic context, activities, and assessment; access to expert performance and modeling; diversity of roles and perspectives; support for the collaborative construction of knowledge; opportunities for reflection; the sharing of ideas (articulation); and scaffolding and coaching for critical learning. Psychology students were assigned either the situated or lecture-based learning curriculum. The researchers found that the situated approach increased the academic achievement and intrinsic motivation of students. They note that the situated approach requires active learners.


This article explores the gap between theory and practice in teachers. New teachers typically do not use pedagogy to influence their practice. Using situated learning theory, the author suggests that teacher educators have a simplistic view of teacher development which has been developed by research that looked at teachers from the outsider perspective versus the insider perspective. Therefore, an integrative perspective that links the novice teacher’s experience to the development of a gestalt, then a schema, and finally linkage to theory is proposed. The three-level learning model and learning processes provides an interesting model for bridging practice with scholarship.


This paper describes a method to promote clinical diagnostic reasoning using a cognitive apprenticeship approach. They argue that modeling, coaching, and scaffolding are the core principles for teaching in the traditional apprenticeship model which allow the student to perform a task. The teacher must also add articulation and reflection (cognitive apprenticeship encounters) in order to create a space for the student to verbalize their knowledge and thinking while also comparing their performance with others. They argue that this stage develops observational and problem solving strategies. Finally, exploration is where the student solves problems on their own.

Situations that were appropriate for cognitive apprenticeship encounters were identified and they lasted, on average, 9 minutes and resulted in continued
learning after the encounter as the student explored the topic on her/his own. Both students and faculty attended a training session on how to use the method and identify suitable cognitive apprenticeship encounters.


This paper describes a technique for teaching reflective practice in pharmacy placements. They conceptualize a reflective model based on Kolb that includes not only reflection-in-action and reflection-on-action, but also reflection-for-action (what will I do in the future). The research uncovers that universities are not providing enough instruction and support for reflective practice and that reflective practice is time consuming for students.


This article provides a concrete example how reflection is a requirement for learning from experiences and this reflection is embedded in social relations and cultural artifacts. The researchers used ethnographic and sociolinguistic methods to describe how racially diverse youth “developed new conceptions of identity and diversity without curricular resources” (p. 160). They demonstrate that circle talks enabled broader meanings to become available locally, which then allowed for the creation of new attitudes and possibilities.


This article explores the issue that pharmacy internships often result in student imitation of the role model with little learning. An educational intervention was designed that involved linking the theory of diabetic patient management with a practical case study. The students who completed the assignment showed significantly greater mastery of the topic than those students who did not. The study also found that the structured instruction facilitated improved internship learning perhaps because the assignment’s activities legitimized the student’s integration into the community of practice.


This article explores in the unnatural role of the teacher in situated learning. The concepts of authentic tasks and anchored instruction are linked to describe four critical tasks that are required for designing instruction through a situated approach. These tasks are: (1) select appropriate situations that will facilitate the learning goals (a generator set); (2) provide scaffolding that bridges novice to
expert learning; (3) develop supports that facilitate student tracking by the teacher; and (4) define the role and nature of the assessment. These critical tasks are illustrated using the design principles that informed the creation of the Jasper Series. The Jasper Series develops mathematical problem-solving.

Epistemology of Practice


Argyris and Schön explain how the explicit, scholarly knowledge of academia is in direct contrast to the implicit, tacit knowledge of practice. They provide a comprehensive and illuminating description of the differing epistemologies of scholarship and professional practice. They then analyze how workplace effectiveness can be increased. They theorize how thought and action are integrated in practice through the concept of espoused theories (how one claims to act) and theories-in-use (how one acts). In collegial environments, practitioners are subsumed by the prevalent theories-in-use which rewards and represses specific behaviors and eventually leads to diminished effectiveness over the long term. When clear and rational interventions are introduced that do not result in behavioral change, it is often because these interventions challenge the group’s norms and values and threaten perceptions of effectiveness – long-standing, prevailing theories-of-use block change.


With his work with animals, Bateson theorized that all biological systems are capable of learning and mapped a hierarchy of progressive learning with 5 levels that has informed systems thinking, artificial intelligence, and situated cognition. He coined the term deutoro-learning which is the ability to learn to learn (adaptive change).


Some bureaucratic organizations have evolved in the last 50 years to “employee-centered, team-based, networked, and information- and knowledge-intense structures struggling to keep pace with change.” (p. 11). Employees in this type of organization require a high level of employee adaptability and organizational agility. Therefore employees need to be able to quickly and correctly identify and act on feedback. This book details the complex relationships between the emergent characteristics of the environment and system that affect optimal performance - letting creativity and problem solving capacity inform right
decisions which lead to right actions. This book describes in detail the skills required of workers in flat, organic organizations.


Ericsson describes how individuals engaged in sustained, deliberative practice will become experts. He explains that most tasks are routine and therefore we naturally automate our performance. Therefore, there is no discernable difference between novice and expert performance. Only when we continue to examine and be curious about these routines, adapting our performance based on feedback and coaching, can we reach expertise.


This book introduces the reader to the concept of systems thinking and how individuals learn within their environment, or system. Effective problem solving within a system results from the correct identification and analysis of feedback loops that inform changes in mental models, behavior, and the system in order to generate the desired result. They label this process generative learning and contrast it with simple and no learning. Simple learning occurs when only the feedback is acted upon to get the desired result with no change in mental models while no learning occurs if the feedback is ignored and behavior is not changed.

**Situated Approach to Workplace Learning**


They developed “a framework that identifies how some specific forms of cognitive schemas (i.e., rule schemas, event schemas, person schemas) and specific contexts (e.g., physical contexts, institutional contexts) interact during sensemaking processes to give rise to momentary perceptions that [they] call situated cognition” (p. 422). These interactions of schema and context will result in decisions being made for 4 reasons – option attractiveness, distinctiveness self-perception, problem understanding, and collective mindset. They conclude that the intersection of schemas with context will define an individual’s understanding of the problem and therefore, learning interventions should develop fluid schemas that help the individual to effectively adapt to the context.

This article demonstrates how service technicians of electrical engineering systems learn how to service these systems through temporal entrainment. They contrast successful external entrainment of the service technicians across a distributed workplace against unsuccessful internal entrainment with the resources of the organization. This study illustrates the importance of temporal aspects when designing situated and/or workplace learning.


This research paper illustrates how the variations in performance between pipe-layers within a utility company can be resolved using a situated approach. They identify how management practices and objects “define the landscape of situated learning” (p. 552) within the organization. The paper illustrates the role of socio-technical systems and artifacts within organizations that result in situated and collective learning. The paper finds that the pipe-layers’ “learning trajectories are shaped by the problems they solve together” (p. 559) as a team (versus across teams); that poor performance can be correlated with a poor relationship with management; and the organization had a lack of clear performance measures and a reward system that is not aligned with the desired performance. They describe how the management team can leverage the practices and artifacts of situated learning to improve performance. They encourage the focus on practice versus community.


This paper compares two educational workplaces that require their staff to document their instruction to allow for comparison across organizations (commodification). A workplace whose staff displayed mastery of the paperwork processes were contrasted with a workplace whose staff was only managing the paperwork processes. This research identifies that resources for learning, stability during change, and the integration of paperwork with other work processes facilitated situated learning and mastery of the paperwork. Resources for learning included time and space, mediating artifacts, and other people. Stability during change allowed for repetition which developed skill. The paperwork is best integrated into a single system/method, it must be directly related to the instruction, tied to professional competency, and training must be integrated into regular work activities.
Challenges & Limitations to the Situated Approach


This article explores the impact of a shortened clinical placement from the nursing student’s perspective and reveals that students in a community of practice must be accepted not just professionally but also socially. They find mentors implicitly use situated cognition strategies of modeling, coaching, scaffolding, fading, articulation, reflection, and exploration as described by Brown, Collins, and Duguid (1988). Mentors do not understand “the importance of social and professional incorporation of students and the difference between them” (p. 855).


This article identifies the limits to communities of practice, as defined by Lave and Wenger (1991) and Wenger (1998). The challenges include power, trust, and predisposition. Power shapes, influences, and inhibits the workers’ abilities to create negotiated meaning. This power can come from managers as well as the workers themselves and can result in significant workplace conflict. A lack of trust in the workplace, which is manifested in adversarial management/worker relationships and competition between workers, will not foster learning and innovation. Finally the predisposition of the community of practice may help or hinder their ability to learn and innovate and “ways of doing things can become institutionalized within routines and practices” (p. 630). The limits include the suitability of communities within the current western business model that tends to be individualistic and does not encourage self-management. The article suggests a focus away from communities and towards practice is warranted.


This article argues that if the situated approach understands learning to occur outside the individual and within a community of practice then our traditional approach to assessment must change. However, when deciding on what and how to assess, we invariably introduce power. The author suggests that the assessor must examine her/his own perspective, how they see things through her/his perspective, and how others see her/his perspective. This process will allow the community of practice to be inclusive of unique trajectories of learning and acknowledge the range of legitimate peripheral participation.