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Framing Faculty Development as Workplace Learning

Gary A. Smith

Higher-education faculty, like most workers, develop knowledge and skills for their job mostly through informal learning during work. In contrast, centers for teaching and learning traditionally emphasize formal-learning events to promote learning and development about teaching. Drawing on workplace-learning research and learning-and-development practices in nonacademic organizations, a faculty-development model arises that elevates the importance of strategies and resources that enhance individuals' informal learning where they work. These approaches, when nurtured and resourced by centers, offer the potential to reach faculty who do not attend formal events, enhance transfer of formal learning to teaching practice, and offset dissemination of low-quality practices among peers with variable expertise.

Introduction

Educational development units in higher education, hereafter referred to as centers for teaching and learning (CTLs), support effective teaching, curriculum design, and assessment strategies to improve student learning. In North America, the mission to develop individual faculty, i.e., faculty development, emphasizes scheduled events and instructor consultations with program experts (Beach, Sorcinelli, Austin, & Rivard, 2016). The most common events are hours-long workshops, multi-day institutes/retreats, and year-long longitudinal programs (including faculty learning communities—FLCs).

The focus on formal learning located outside the employees' worksite contrasts with practices within comparable learning and development (L&D) programs at nonacademic organizations and corporations. L&D program practices are informed by research that points to dominant workplace learning through experience, reflection, and social engagement with coworkers during everyday work, rather than by formal workshops and training (e.g., Billett, Dymock, & Choy, 2016; Malloch, Cairns, Evans, & O'Connor, 2011; McKee & Eraut, 2012). At the core of the philosophy for progressive L&D is that people learn about what matters to them at the time

and place they desire or need to know it (Shackleton-Jones, 2019). For example, the 70:20:10 concept is popular in L&D (Arets, Jennings, & Heijnen, 2016; Paine, 2014; Scott & Ferguson, 2016); 70% of work-relevant learning occurs during an individual's work experience, 20% as exposure through social interactions, and 10% as scheduled education events. The concept is based on employee surveys that investigate sources of work-related learning and is consistent with frameworks for experiential and social learning. The specific numbers are contested (Clardy, 2018) but the ratio is symbolic and varies with context, organization, or individuals. Nonetheless, 70:20:10 highlights learning as a process toward improvement and not a series of scheduled events. Alongside data illustrating workers' limited time for formal learning and their need for just-in-time learning (Degreed, 2016), the 70:20:10 framework guides programs in L&D that differ significantly from most of those in CTLs by acknowledging the limitations of formal, scheduled events (Clardy, 2018; Paine, 2014).

The inability to isolate the impact of formal offerings from everyday learning with peers and in classrooms challenges evaluation of CTL programs (Bamber, 2008). As Amundsen and Wilson (2012) write, "We know more about how to design educational development initiatives to improve individual teaching practice but less about how this learning is actualized and embedded in the academic workplace" (p.111). This shortcoming highlights the necessary integration of formal learning with accurate transfer to practice, which occurs in the presence of students, sometimes with faculty peers, and rarely within view of faculty developers (Hoessler, Godden, & Hoessler, 2015).

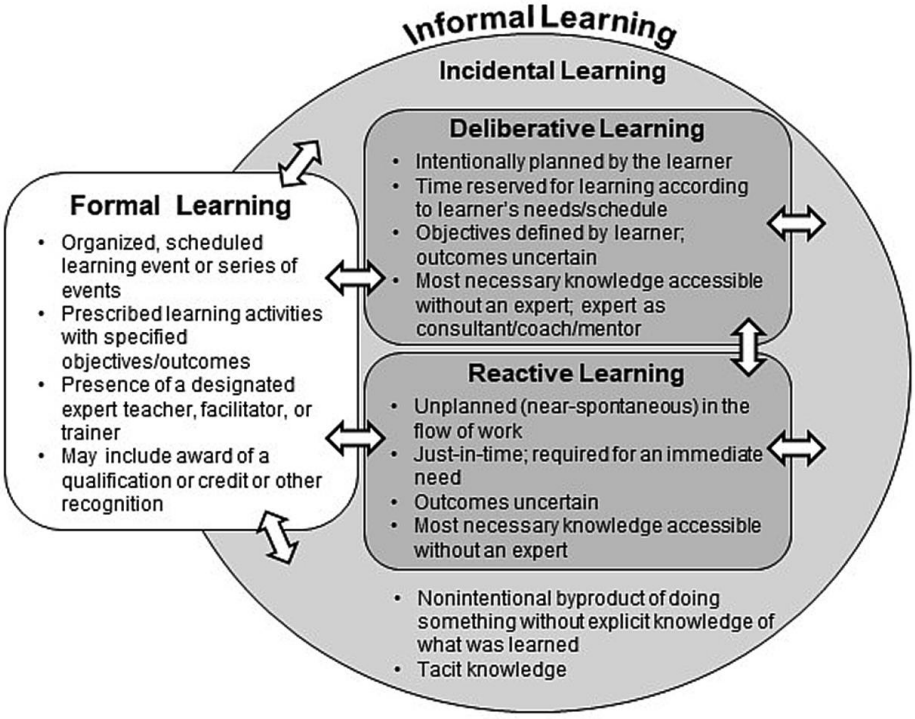
This paper proposes a faculty development model for CTLs that is framed within broader contexts of professional development and workplace learning. The model is informed by existing evidence that faculty learning resembles workplace learning in other professions; the model draws on L&D practices to propose companions to formal programs that can be tested in higher-education settings.

What Is Workplace Learning?

Workplace learning is the ever-present acquisition of knowledge or skills at the place of work (Cacciattolo, 2015) and includes formal learning experiences designed and instructed by others along with informal learning that is less structured in time, space, content, and facilitation while mostly driven by the needs of the learner (Figure 1). The faculty workplace includes instructional sites (e.g., classrooms, laboratories, field, community, clinic), venues where faculty discuss teaching (offices, faculty meetings, informal peer conversations), and formal CTL and other professional-development events. Higher-education instructors deliver formal learning, and they experience formal learning to develop as teachers through conferences, workshops, institutes, and FLCs. Formal learning contrasts with learner-driven informal

learning (Figure 1) that may be self-directed and planned (deliberative), nearly spontaneous in response to immediate need (reactive), or unconsciously achieved consequential to activities (incidental). Informal learning occurs independently of formal learning events and also aids transfer from formal-learning events to the worksite (De Rijdt, Stes, van der Vleuten, & Dochy, 2013; Ford, Baldwin, & Prasad, 2018) if appropriately supported in the worksite by the organization and supervisors (Johnson, Blackman, & Buick, 2018).

Figure 1
Formal Vs. Informal Learning



Note. Formal learning is distinct from informal learning, which is deliberately planned, reactive to unplanned needs, or unintentionally and unconsciously incidental to other informal or formal learning. Arrows show interaction of all forms of workplace learning. Informal learning aids transfer of formally-acquired knowledge to practice. Self-directed, deliberative learning may include the choice to participate in formal learning. (Based on Eraut, 2000; Jeong, Han, Lee, Sunalai, & Yoon, 2018; Watkins et al., 2014.)

Formal learning is episodic and orchestrated external to the learner/worker whereas informal learning is a continuous unavoidable consequence of, and inseparable from, work. Despite advantages of full-time informal learning, problems arise because of limited expert influence. There-

fore, as Watkins, Marsick, and de Alava (2014) claim, the "degree of variability of outcomes, the depth of learning and the potential for both serendipitous and errorful learning increase" (p. 63). Avoiding inaccurate, low-fidelity practice emerging from informal learning is critical to the model developed here.

How Faculty Learn About Teaching

The ways that faculty learn about teaching align with the 70:20:10 model, which de-emphasizes the significance of formal learning. Three survey-based studies yielded similar impressions of how, where, and with whom faculty learn about teaching and develop as teachers. Oleson and Hora (2013) surveyed 58 STEM faculty at a United States research-intensive public university; Knight, Tait, and Yorke (2006) surveyed 2401 part-time faculty at a public university in the United Kingdom; Hativa (1997) surveyed 115 faculty at an elite, private U.S. university. In all three studies, participants viewed the actual experience of teaching as the most important source of knowledge to inform teaching practice. Drawing on prior experiences as a student was selected as second-most important by respondents in the Oleson and Hora (2013) and Knight et al. (2006) studies. Reflection on student ratings, self-directed learning about teaching approaches, interaction with other instructors (including co-teaching), and mentorship in teaching were also prominent among the responses. Although 89% of the participants in the Knight et al. (2006) study had attended faculty development workshops, these formal learning opportunities were viewed as comparable to learning from colleagues and subordinate to personal teaching and learning experiences as ways of learning to teach; this result was similar in the Oleson and Hora (2013) study. Thirty-six percent of Hativa's (1997) survey respondents had attended faculty development workshops, but no respondent rated these experiences as "large" or "very large" contributors to how they learned to teach.

Learning from personal experience and reflection on that experience was considered far and away most important in the three studies. Interaction with peer teachers through conversations about teaching, peer observation of teaching, and co-teaching was viewed in two of the three studies as more important than faculty-development workshops. Therefore, the relative importance of learning through individual work, learning with others, and learning through formal workshops are comparable to the 70:20:10 model.

Interviews of medical-school faculty also show the prominence of the personal experience of teaching, having access to mentors and role models (including co-teachers), and discussing teaching among other teachers within informal networks and communities as forms of learning in the academic workplace rather than in formal development events (Chen et al., 2016; MacDougall & Drummond, 2005; Steinert, 2012). Cantillon, D'Eath, de Grave, and Dornan (2016) point to the research on faculty development of

clinician educators to show "that teacher knowledge is constructed by teachers themselves based on their personal insight and interpretations of evidence . . . [C]linical teachers are in essence self-authored" (p. 992).

Through examination of teaching diaries by fifteen faculty in The Netherlands, Van Eekelen, Boshuizen, and Vermunt (2005) found that most learning about teaching is informal. Learning via interactions with students and colleagues occurred more frequently than individual learning through class-preparation processes, reading, or reflecting. Deliberative learning that was planned by the faculty member on the basis of an identified need was roughly equal with reactive learning resulting from an unexpected problem.

In a phenomenographic, survey-based study of 1622 science faculty at Finnish universities, Töytäri et al. (2016) identified four categories demarcating how teachers describe their own learning. Although the research question did not specify learning about teaching, the study nonetheless captures views of how faculty approach professional learning. The categories include learning alone, learning with a colleague, learning collaboratively in a group, and collective learning through social networks. The authors make no mention of formal learning as a theme in the responses. The categories are very similar to those emerging in Smith, Stark, and Sanchez's (2019) phenomenographic study of how faculty conceptualize course design as an individual, group, or larger collective process.

Faculty maintain extensive research networks, whereas teaching is stereotyped as a solitary activity. In light of a CTL's mission, this stereotyping stimulates investigation of social networks that *do* support teaching. Learning in networks involves activities (e.g., dialogue, observing, reading, collaborative work, attending events together, comparing results) appropriate to acquire pedagogical and assessment skills as well as knowledge about teaching and learning processes, instructional technologies, classroom management, and course design (Pataraia, Margaryan, Falconer, & Littlejohn, 2015). Jippes et al. (2013) document a social network that was more effective than workshop training for implementing a teaching practice. Typical network conversations are private and built on trust, reciprocity, and shared concerns about pedagogy or content (Roxå & Mårtensson, 2009). Well-regarded teachers and discipline-based education researchers who are viewed as opinion leaders preferentially occupy network hubs (Andrews, Conaway, Zhao, & Dolan, 2016). The most common conversational partners are within a department and even more so within subdisciplines (Andrews et al., 2016; Roxå & Mårtensson, 2009), suggesting affinity for discussing teaching that is connected to shared content interest (Stes, Clement, & Van Petegem, 2007). It is likely that the most common networks are teaching groups consisting of those teaching the same or related courses (Heinrich, 2015). Network size and conversation frequency relates to departmental cultures (Roxå & Mårtensson, 2009), and network size, strength, and diversity increase during a faculty member's career (Van Waes, Van den Bossche, Moolenaar, De Maeyer, & Van Petegem, 2015). Participation in CTL programs also increases

network size beyond proximal colleagues (Moses, Skinner, Hicks, & O'Sullivan, 2009; Rienties & Kinchin, 2014; Van Waes et al., 2015), and formal-program interventions that create networks can increase this effect (Ma, Herman, Tomkin, Mestre, & West, 2018; Van Waes, Moolenaar, Maeyer, Van Petegem, & Van denBossche, 2018).

Some faculty developers highlight relationships between formal and informal learning. O'Sullivan and Irby (2011) note the existence of a development community that socializes educators from many disciplines through participation in formal programs and a larger, informal workplace community. Development-community learning defines tasks and activities for participants to practice and disseminate within the workplace community. Interaction between these communities is viewed by Hafler et al. (2011) as an overlooked aspect of CTLs to socialize faculty through a process of "occupational enculturation" that is incompletely accomplished through formal events (p. 442).

Steinert (2010, 2014) presents a typology of faculty development that is based not only on formal versus informal learning but also on whether learning is pursued individually or in a group. Her model draws partly from a meta-analysis (Steinert et al., 2006) concluding that effective faculty development requires experiential learning to apply workshop-acquired knowledge with peer and expert feedback, and information exchange through communities of practice (CoPs). This point is also consistent with the concept of inert knowledge that remains only shallowly known out of the context of application (Renkl, Mandl, & Gruber, 1996).

The importance of informal learning is further highlighted by the observation that formal CTL programs do not always successfully attract faculty participants. As self-directed adult learners, faculty may not find workshop offerings pertinent to immediate needs, too generalized for what motivates their learning, and potentially viewed negatively for not recognizing their personal teaching experience and knowledge (Hansman & McAtee, 2014). Furthermore, Post (2016) presents evidence that faculty members' motivations and needs evolve during their career, such that generalized workshop and learning-community topics are inadequately targeted to an individual's developmental stage. Therefore, faculty learners motivated by immediate needs may seek self-directed informal learning solutions.

Despite evidence for the dominance of individual and social informal learning, there are limitations. Inaccurate implementation of instructional practices that diminish anticipated student-learning outcomes results from several factors (Andrews, Leonard, Colgrove, & Kalinowski, 2011; Dancy, Henderson, & Turpen, 2016; Smith, 2015; Stains & Vickrey, 2017). These include incomplete learning through self-directed inquiry, accessing erroneous information from presumed-expert peers, assimilating rather than accommodating practice recommendations because of incomplete conceptual understanding, as well as transfer from formal learning in the absence of observation and feedback.

The Beach et al. (2016) survey of CTL directors in the United States and Canada does not reveal intentions to address informal learning. Major growth programs for addition or expansion are FLCs (ranked first) and full-day institutes (second), which are the most time-intensive and expensive of formal-learning offerings. Increasing popularity of longer formal programs likely relates to their positive impact on teacher behavior and student learning (e.g., Beach & Cox, 2009; Condon, Iverson, Manduca, Rutz, & Willett, 2016; De Rijdt et al., 2013; Onyura et al., 2017). This success relates to the benefits of spaced learning, deliberate practice with learned concepts, explicit transfer from the workshop classroom to the teaching venue, and opportunities to link formal and informal learning over a period of time (Van den Bossche & Segers, 2013; Yelon, Ford, & Anderson, 2014). When asked about the issues to address in the next five years, CTL directors pointed to external forces (outcomes assessment, online teaching, diversity, curriculum reform) rather than faculty needs and motivations for learning.

Workplace Learning Beyond the Academy

The L&D literature originates in two different communities. Academic workplace-learning research in peer-reviewed sources is separate from the dissemination of practice by L&D professionals through trade journals and books, content-marketing reports, and blogs. These contrasting treatments of L&D converge on the same conclusion: Most learning is informal and situated in the work itself, including its social and organizational contexts (e.g., Billett et al., 2016; Eraut, 2000, 2012; Paine, 2014; Arets et al., 2016; Shackleton-Jones, 2019).

L&D programs aim to empower a self-reliant, self-motivated learner who can address personal learning needs to solve problems and meet development goals, with minimal intervention or dislocation from the worksite. Workers pull needed knowledge that they care about through informal learning as distinct from L&D pushing formal-learning knowledge that may not be immediately useful or wanted (Cross, 2007; Shackleton-Jones, 2019). Informal learning is simultaneously pervasive and diffuse and potentially motivated by self-directed goals that are outside of L&D priorities. Therefore, L&D provides resources that enable individual or social informal learning at the worksite (Marsick & Watkins, 2015).

L&D resources assure that learners engage with accurate information and knowledgeable peers. Whereas formal learning involves delivery of high-fidelity information and research-based practices by experts, the quality of worksite knowledge and expertise is highly variable. Research shows that people are increasingly using internet content as an extension of their own memories, which diminishes learning by focusing on memorizing where information exists rather than on memorizing the actual information (Firth et al., 2019). Therefore, L&D must build credible, trustworthy online resources

so that people access the most correct or desirable information (Scott & Ferguson, 2016). An easily accessible and habitually visited website or learning management system avoids leaving employees to sort through thousands (or millions) of sources of variable quality and relevance that result from an internet browser search. These resources diminish limitations of informal learning among co-workers that arise because of (a) learning that is inaccurate, yet available and reinforced in worksites; (b) the contested nature of work practice that inhibits equitable access to learning activities and guidance; (c) difficulties in learning conceptual knowledge not readily acquired in the course of work; and (d) inaccessibility of appropriate expertise and experiences to develop needed knowledge and skills (Billett, 2002; Clardy, 2018).

Resources fall into two categories: *performance support* that is task centric and *microlearning* that is topic centric. Performance support provides on-demand access (via email, websites, social media) for how-to information, checklists, and tools that enable performance at the moment of need with minimal support from other people (Gery, 1991; Gottfredson & Mosher, 2011). Similar assistance could be provided by a knowledgeable peer or a coach, but L&D practitioners focus on the efficiency of locating the necessary information quickly among accurate resources created by L&D and delivered online. Focused on behaviors and tasks, performance supports also enhance transfer from formal events to actual practice both by refreshing knowledge forgotten since the formal learning event and by providing the procedural steps to implement a practice at the place and time of use (Emerson & Berge, 2018; Gottfredson & Mosher, 2011). This bridging role for performance support is particularly important if formal training provides limited opportunity for practice and feedback with otherwise inert knowledge or skill. The performance-support resource, itself, may not truly create learning if the intention is to provide repeated access to needed information because the knowledge may be externalized to the internet, which diminishes the need to internalize the knowledge itself but rather to simply remember where to find it (Firth et al., 2019; Shackleton-Jones, 2019).

Microlearning has arisen as a popular way to support ongoing informal learning while diminishing distractions to work, accommodating the limited available time for formal learning, and limiting the risk of inaccurate informal learning. Emerging from the knowledge management profession nearly fifteen years ago (Schmidt, 2007), microlearning has evolved with many definitions and specifications (Bersin, 2018; Emerson & Berge, 2018; Paine, 2014). Microlearning resources are standalone, usually single-objective lessons made available as videos or interactive e-learning modules that are two– to fifteen-minutes long. Microlearning modules provide opportunity for deliberative informal learning with voluntary pathways to explore conceptual background and research evidence. L&D professionals also utilize microlearning alongside formal learning as preparation for, or subsequent refreshers of, training events. Surveys reveal existing or impending use of

such short-duration, unscheduled learning episodes by more than 65% of L&D professionals (Cole, 2017). Although the short duration is ill-suited for developing deep understanding of complex concepts or procedures, the integration of microlearning with experience and other learning opportunities is viewed as effective (Margol, 2017), especially as a follow-up to formal learning events (Emerson & Berge, 2018). Learners pull needed knowledge when suited to their schedule and time of need, but the content is developed by the L&D program to assure the credibility of the information and the alignment to the objectives of strategic formal-learning opportunities.

The term "microlearning" is disputed by some L&D experts (e.g., Shackleton-Jones, 2019) because learning is an outcome and not something that is designed. Microlearning modules may be less effective if simply dividing pushed formal learning into smaller chunks rather than designed for the learner to pull when wanted and with consideration of the learner's interests and concerns.

Workplace learning is not restricted to technology interventions with performance supports and microlearning. Learning during work draws substantially on Billett's (2004) concept of co-participation as a reciprocal process of workplace affordance for learning and on how individuals co-constructively learn with others. Through this process, social networks arise for information flows, joint problem solving, and knowledge creation.

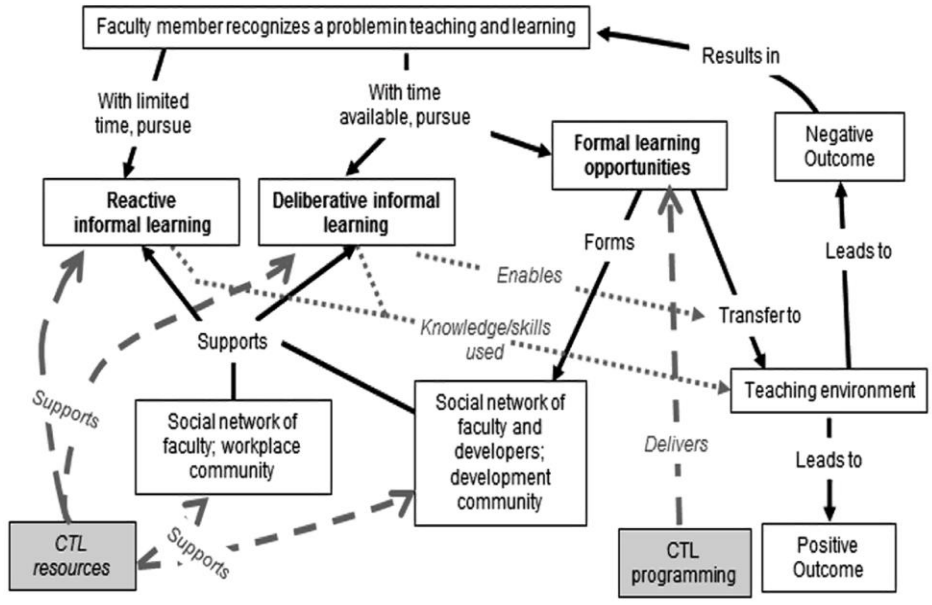
Deeper social connections result in communities of practice (CoPs) whose voluntary participants develop a shared identity around a topic or problem with the collective intention to sustain learning about it (Lave & Wenger, 1991). CoPs were initially described as organically formed, informal groups of changing participation situated in the workplace. Later authors suggested that organizations nurture CoPs (Wenger, McDermott, & Snyder, 2002) or even intentionally form them to meet organizational objectives (McDermott & Archibald, 2010). Scott and Ferguson (2016) encourage L&D offices to support CoPs when they arise on their own to make them more efficient, reduce redundant effort, and capture and manage the created knowledge.

Learning during work and transfer from formal events to work require a learning culture in the organization (Eraut, 2012; Johnson et al., 2018; Paine, 2014). This culture creates and moves knowledge through the organization and aligns L&D expectations with rewards and performance management. Otherwise, programs and resources developed by L&D lack traction with employees. Likewise, the L&D program, wherever located in the organizational chart, must integrate with other operations to meet the learning needs of employees and the organization. This integrative process might involve providing L&D expertise to create formal- and informal-learning elements that are owned and delivered within other units, closer to where work is done. The integration and prioritization of the L&D functions is best recognized by organizations that have a chief learning officer responsible for those roles (Elkeles & Phillips, 2007).

A Workplace-Learning Model for Faculty Development

Like other working professionals, faculty primarily acquire teaching knowledge and skills through informal learning (Hativa, 1997; Knight et al., 2006; Oleson & Hora, 2013). Appropriately, CTLs should move from considering "learning as something that individuals do, to seeing learning as a social process occurring within the context of practice" (Boud & Brew, 2013, p. 209). CTL directors may benefit from the experiences of L&D programs that primarily support the efficacy and implementation accuracy of informal learning that happens out of developers' view. Figure 2 illustrates hypothetical pathways for problem solving that drive faculty learning about teaching. The reality of learning and work indicates benefits from formal learning but, even more so, from access to research-based strategies and expert guidance on an informal, as-needed basis. Formally acquired knowledge must also transfer to the teaching environment; faculty-development facilitators can be mentors and coaches in the workplace and social networks developed through CTL events can become engines of dissemination and feedback on teaching practice within the workplace.

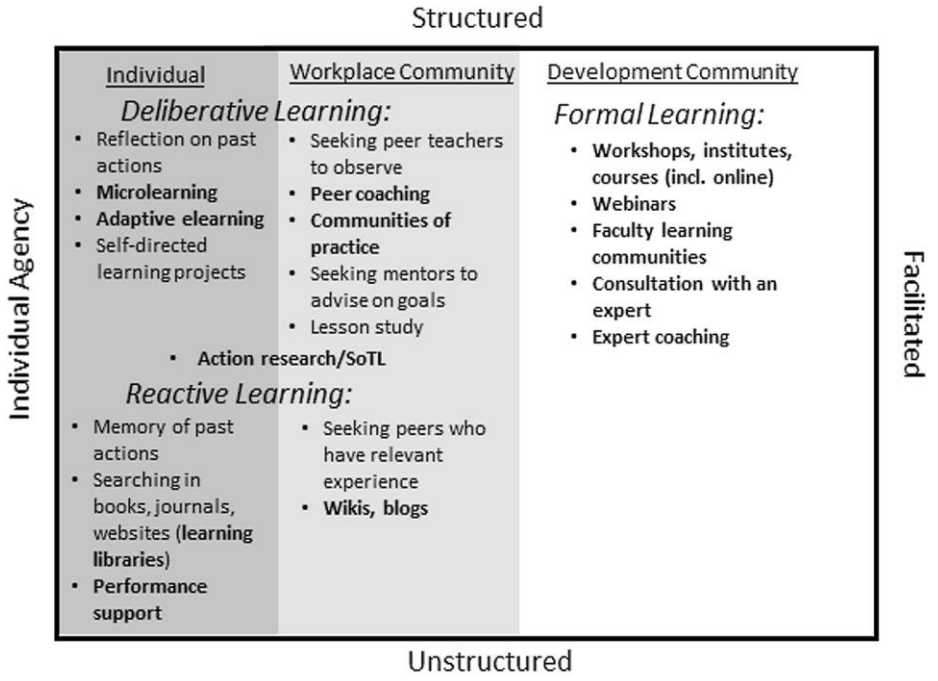
Figure 2
Potential Pathways Through Informal and Formal Learning Activities



Note: Concept map shows potential pathways through informal and formal learning activities (black arrows) for a faculty member resolving a learning need. Interactions between informal and formal learning including transfer of learning (dotted gray arrows). CTL faculty development programs contribute to these learning processes (dashed gray arrows).

Figure 3 illustrates a broad view of faculty development through CTLs that includes deliberative and reactive informal learning alongside formal learning, with varying levels of facilitation and predetermined structure. The expanded focus of CTL support for informal learning reaches the majority of faculty who attend few CTL events and helps assure accurate transfer of formal learning to the teaching environment. The model incorporates individual and socially mediated informal learning alongside the expert-facilitated CTL program, thereby incorporating the development and workplace communities advocated by O'Sullivan and Irby (2011).

Figure 3
A Typology of Faculty Learning About Teaching



Note. A typology of faculty learning about teaching is related to the extent of individual agency in contrast to expert facilitation and the structured or unstructured aspect of the learning activities. Examples of formal learning and deliberative and reactive informal learning are provided and include the workplace and development communities of O'Sullivan and Irby (2011). Bold items are those that can be explicitly supported or delivered by faculty-development programs.

CTLs provide web-based resources, but mostly as links to content that form vetted learning libraries of knowledge (Beach et al., 2016). Where links or downloadable files are numerous, they may not provide efficient access

to the most critical knowledge. Longer webinars and online workshops, increasingly popular among CTL directors (Beach et al., 2016), have similar limitations to formal learning because it is difficult to access the quick-reference information within a large e-learning resource. Following L&D, more attention could be given to developing interactive microlearning modules. Adaptive pathways in these modules focus learning on what is needed and cared about, recognize existing teaching knowledge, and provide choice for deeper dives into theory and evidence to obtain principled practical knowledge of teaching methods essential for accurate implementation (Smith, 2015). "Teaching tips" web pages serve as performance supports, especially when highlighting the steps in the implementation of a structured teaching process. Readily available performance support for peer instruction, for example, may alleviate the commonly observed unproductive assimilation of the method with existing practice (e.g., Dancy et al., 2016). Intentional email delivery of performance support and microlearning links additionally provides spaced follow-up to workshop participants to refresh knowledge and promote transfer. When optimized for mobile devices, these resources improve access in any venue where just-in-time learning is required, including the classroom.

Applying learned knowledge or skill requires practice and feedback. The traditionally solitary nature of college teaching is a barrier to this objective that can be lessened through observation-based peer coaching. Coaching in L&D and in pre-tertiary teacher development (Desimone & Pak, 2017) focuses on roles of supervisors or embedded coaches, neither of which are applicable to higher education. However, peer coaching that takes advantage of teaching expertise and co-exploration of teaching challenges is feasible through peer observations of teaching (e.g., Bell et al., 2019; Huston & Weaver, 2008). Currently, classroom observations by expert CTL staff are utilized more often than peer observations, although supporting peer observation is viewed as an important growth goal (Beach et al., 2016). CTL programs can create classroom or online tutorials about best practices for observing and providing feedback, and deliver easily accessed microlearning resources that support observation-feedback conversations.

Reflection about teaching expands to a self-directed learning plan when faculty investigate learning in their classrooms.

Classroom action research (Mettetal, 2002), undertaken individually or with colleagues, may emerge more for professional development than as scholarship (Geertsema, 2016), with the development activities expanding inquiry to include instructors in roles where research is not expected. Where multiple faculty who teach within a course or a curriculum collaborate to explore the efficacy of student learning, a lesson-study model may emerge (Cerbin, 2011). These curiosity-inspired efforts may be invisible to the CTL but can be enhanced and seeded by microlearning resources and web links regarding the scholarship of teaching and learning.

Social networks are important to faculty members' development as teachers (Kezar, 2014), and CTL programs should seek out and support prominent networks to assure awareness of applicable microlearning and formal learning resources and to create additional needed resources. Departmental opinion leaders who form local network hubs for teaching development can be recruited for formal train-the-trainer sessions to build toolsets for disseminating and coaching research-based practices locally rather than at centralized CTL events. Formal-learning events, particularly longer, longitudinal programs, can explicitly foster networks for informal learning within the development community.

The observation (De Rijdt et al., 2013) that novice teachers gain most when they learn through collaboration with others and by working alongside more experienced colleagues points to the value of CTLs nurturing CoPs. The concept of CoPs has evolved since origination by Lave and Wenger (1991) such that multiple meanings for it exist in higher education, particularly with regard to whether CoPs arise spontaneously among those drawn by similar interests and problems to solve or are intentionally created to serve institutional priorities (Buckley, Steinert, Regehr, & Nimmon, 2019; McDonald & Cater-Steel, 2017). An FLC is considered an intentionally created CoP by some (McDonald et al., 2012) although the defined membership, duration, objectives, and formalization of FLC as a longitudinal program within CTLs are contrary to the original CoP conceptualization (Stark & Smith, 2017). If a CoP becomes "a 'design intention' or a 'prescribed process,'" as Wenger (2010) writes, "then it loses the very insights that made it useful as a naturally emergent aspect of deliberative, informal, social learning" (p. 192). Nonetheless, CTLs can nurture emerging CoPs through promotion to enhance visibility, responding to resource needs, and providing meeting spaces. Through the nurturing process CTLs expand the reach of learning about research-based practice beyond the affordances of formal programs, especially where CTLs have limited staff (McDonald & Cater-Steel, 2017; Stark & Smith, 2016). Some CoPs build from networks originating in FLCs (Stark & Smith, 2017). Embedding mentors within CoPs enhances bridging of knowledge between the communities (Ma et al., 2018).

Sources of teaching knowledge are as important as resources. Even when CTLs have numerous consultants for advice or coaching, it is possible that faculty will rely more on peers (Andrews & Lemons, 2015). CTLs support beneficial networking by maintaining easily accessed lists of faculty who are experienced in pedagogy or assessment and willing to share with other faculty, permit observers in their classrooms, or both. These networks may fuel opportunities to crowdsource knowledge and skills through wikis that are administered, contributed to, and monitored for misleading information by the CTL.

Organization support for informal learning in the flow of work is essential. Even when faculty participate in formal CTL learning, the transfer of

learned practices to sustained changes in teaching is influenced by the existence, or absence, of a supportive environment for learning within departments and the organization as a whole (Boelryk & Amundsen, 2016; Onyura et al., 2017; Roxå & Mårtensson, 2015; Smith & Stark, 2017). Organizational support for workplace learning surrounding teaching behaviors and student learning is an under-researched influence on the impact of CTL programs and emphasizes the need to couple organizational and professional development initiatives (O'Sullivan and Irby, 2011).

Conclusions

Higher-education institutions have always been bastions of formal learning. Perhaps this explains why many CTL programs mimic learning delivered to students. Workshops resemble classes offered at scheduled times and led by experts who pre-identify learning objectives. FLCs resemble courses with start and end dates, membership based on application, and expected individual or group outcomes (Stark & Smith, 2016). Consultations resemble appointments where a challenged learner receives guidance from a teacher or tutor.

Although most definitions of faculty development explicitly or implicitly refer to a program of learning (Steinert, 2010), these programs represent only a fraction of workplace learning. Based on the survey by Beach et al. (2016), CTLs do not, in general, plan to systematically support individual and social informal learning. With evidence for the dominance of informal learning, it is important that CTLs adopt practices from the larger L&D community to (a) support the learning needs of those who do not attend formal programs; (b) assist transfer of formal learning to high-fidelity teaching practice; and (c) assure access to research-based knowledge and skills to mediate the potential misconceptions that arise within social networks of varying expertise. Noting the importance of social workplace learning, CTLs should nurture CoPs (Stark & Smith, 2016) and departmental opinion leaders to disseminate knowledge locally and peer coach to provide feedback, while leveraging these networks to expand CTL reach beyond formal programs and staff. Appreciating the many informal-learning opportunities that affect teaching practice and resulting student outcomes, CTLs should re-examine the reality of evaluating formal-program impact (Hoessler et al., 2015). Within a framework dominated by informal learning, faculty development may be best seen as all "actions, planned and undertaken by faculty members themselves or by others working with faculty, aimed at enhancing teaching" (Amundsen and Wilson, 2012). The model presented here intends to assist faculty developers to more fully support that broad definition.

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Gary A. Smith, *Ph.D., is the Associate Dean for Continuous Professional Learning in the School of Medicine at the University of New Mexico. His 32-year career as a faculty member at UNM has included teaching and research in Earth & Planetary Sciences and Organization, Information, & Learning Sciences. He has directed educational development programs for thriteen years, first on the UNM main campus and currently in the School of Medicine. His scholarly interests focus on how professional development programs can support the ways professionals actually learn in the course of their work.*