Medicine as a Community of Practice: Implications for Medical Education

Richard L. Cruess, MD, Sylvia R. Cruess, MD, and Yvonne Steinert, PhD

Abstract

The presence of a variety of independent learning theories makes it difficult for medical educators to construct a comprehensive theoretical framework for medical education, resulting in numerous and often unrelated curricular, instructional, and assessment practices. Linked with an understanding of identity formation, the concept of communities of practice could provide such a framework, emphasizing the social nature of learning. Individuals wish to join the community, moving from legitimate peripheral to full participation, acquiring the identity of community members and accepting the community's norms.

Having communities of practice as the theoretical basis of medical education does not diminish the value of other learning theories. Communities of practice can serve as the foundational theory, and other theories can provide a theoretical basis for the multiple educational activities that take place within the community, thus helping create an integrated theoretical approach.

Communities of practice can guide the development of interventions to make medical education more effective and can help both learners and educators better cope with medical education's complexity. An initial step is to acknowledge the potential of communities of practice as the foundational theory. Educational initiatives that could result from this approach include adding communities of practice to the cognitive base; actively engaging students in joining the community; creating a welcoming community; expanding the emphasis on explicitly addressing role modeling, mentoring, experiential learning, and reflection; providing faculty development to support the program; and recognizing the necessity to chart progress toward membership in the community.

Over half a century ago, Merton[1] pointed out the dual nature of medical education, whose aims are to provide those wishing to become physicians with the knowledge and skills necessary for the practice of medicine and a professional identity so that they come to "think, act, and feel like physicians." Realizing these aims is a task of considerable complexity, and a host of educational theories have been proposed to help understand the process and assist in its organization.[2–4] Despite a diligent search, we have been unable to identify any attempt to bring these theories together into a coherent whole or to explore their relationship to each other. Although Kaufman and Mann[2] suggested that situated learning theory could relate "to several other conceptions of learning, both long-standing and more recent," they did not propose it as a foundational theory for curricular design.

Please see the end of this article for information about the authors.

Correspondence should be addressed to Richard L. Cruess, Centre for Medical Education, McGill University, 1110 Pine Ave. West, Montreal, Quebec, H3A 1A3; telephone: (514) 398-7331; e-mail: richard.cruess@mcgill.ca.

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The presence of many theories that are often competing rather than complementary can pose problems for medical educators, as it is difficult to integrate them into a coherent approach to curricular design. Because of this, it has been suggested that action should be taken to identify and reflect on the many available theories, placing "them within a conceptual framework that can build a coherent body of evidence and, eventually, a better understanding of learning itself."[4]

Most of the educational theories that have been invoked to help understand and guide the course of medical education apply to specific educational strategies or activities that take place within the broad construct of the medical curriculum[2–4] and, as such, are not capable of serving as the basis of a conceptual framework. It is not our intention to review the many theories available. Instead, we propose an approach built around the theory of communities of practice, since we believe that medicine is, and has always been, a community of practice. The theory of communities of practice, originally elaborated by Lave and Wenger,[5] can help by providing the basis for a more integrated, comprehensive, and coherent theoretical approach to medical education. Unlike most learning theories that apply to defined specific educational activities, communities of practice is a robust and broad social learning theory that has the capacity to encompass the multifaceted nature of medicine's knowledge base, including its foundations in biomedical science, the nature of the identity of a physician, and its rich mix of tacit and explicit knowledge.

Communities of Practice

The theory

Constructivism, a theory developed in the latter half of the 20th century, proposes that individuals construct new knowledge from experience and reflect on that experience.[2,4] As a part of this movement, social learning theories emerged that propose that learning is a social activity that takes place in communities and is heavily influenced by history and culture.[5–7] Various terms have been used for these theories, including *communities of learners*[8] and *knowledge-building communities*.[9] As a part of this movement,[10] Lave and Wenger introduced the term *community of practice* in 1991.[5] They emphasized that while the concept was new, Wenger, in a later article,[10] stated that such communities had existed "since man lived in caves." Linking communities of practice to the theory of situated learning, Lave and Wenger

proposed a theory that emphasizes the social nature of learning. Initially the concept was developed in the world of business and management, and much of its literature is still derived from these fields. Of interest, while Wenger[10] clearly indicates that the professions constitute a community of practice, the first reference linking the concept to medicine and medical education appeared in 2002.[11] The theory has since received significant attention in the domain of medical education. Our literature review, using PubMed and Scopus linking *communities of practice* and *medical education*, found 137 articles on the subject between 2000 and 2016. It is worth noting that the term is used in reference to medical education at the undergraduate, postgraduate, and continuing professional development levels.[2,4,12]

Definitions are important, and the one proposed by Barab et al[13] seems appropriate for medicine: A community of practice is

> a persistent, sustaining social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and/or mutual enterprise.

The transition from viewing medicine as a community that has long been characterized by collegiality[14] and morality[15] to the concept of medicine as a community of practice in which learning takes place has inherent logic. The cultural, structural, and behavioral aspects of a collegial profession as well as its moral base become part of the norms of practice.[16]

The concept is clear.[4–6,10–12,17–21] An individual wishes to join a group engaged in a common activity—in this case the practice of medicine—by learning how to carry out the activities in which the group is engaged. In doing so, the individual becomes a member of the group by moving from legitimate peripheral participation to full membership in the group. The individual's early membership is viewed as legitimate because he or she has been accepted as a novice member of the community. Inherent in the move is the gradual acquisition of the required knowledge and skills, along with the identity shared by members of the group.[5,16–18,20] This identity entails the acceptance of core norms and values as well as the organizational structure of the community. While some negotiation of noncore items is possible, failure to accept those deemed essential can result in marginalization or actual exclusion of an aspiring member.[10,16] Achieving competence within the domain is essential, with the standards being determined by the community.[20] According to the theory, learning is a social rather than an individual activity, and much of it occurs at the unconscious level, resulting in the acquisition of a large body of tacit knowledge.[4,6,17,18] The learning is "situated" in the community, and the content is given authenticity because it is acquired in the same context in which it is applied.[5,17,18,21] Learner participation—sometimes designated as coparticipation[19] with members of the community—is essential, as it allows each individual to recreate meaning, transforming knowledge from the abstract and theoretical into something personal and unique.

There are three essential elements to a community of practice, all of which are characteristic of medicine as a profession: domain, community, and practice.[18]

Domain. Snyder and Wenger[18] state that there must be a domain with clear boundaries that creates "common ground and a sense of common identity." This affirms the purpose and value of the community to both members and society. The domain of medicine is the prevention and treatment of human disease and the promotion of the public good.[15]

Community. The presence of a community creates the social fabric within which learning occurs, and membership in the community must be seen as a desirable objective. For the community to flourish, leadership is required and mutual trust and respect are essential elements, as is pride in the purpose and accomplishments of the community.[18,20]

Medicine consists of many communities of practice, and physicians generally belong to more than one.[20,21] Clearly, a physician is a part of a global medical community,[22] but there are national and regional groupings and organizations to which physicians belong and give allegiance.[18,20] A physician's specialty is a community of practice that exerts a particularly strong influence on the identity of its members.[23]

Practice. *Practice* refers to the specific knowledge and skills that the community shares and develops, consisting of a set of "frameworks, ideas, tools, information, styles, language, stories, and documents that the community members share."[10] According to Wenger,[10] in medicine, practice consists of clinical care, educational practices, and research. The word *practice* encompasses a social environment in which both work and learning take place.

When these three elements are present, Wenger believes that an ideal knowledge structure is created "that can assume responsibility for developing and sharing knowledge," a situation that certainly applies to medicine. The knowledge base consists of a mixture of explicit and tacit knowledge that is acquired by those wishing to join the community of practice.[4,6] The community is responsible for the creation and maintenance of the knowledge base, which is constantly being revised, in part through the process of negotiation that takes place as new members achieve full participation.[5,10,12] The dynamic interplay between teachers and learners within the community has an impact on the relevance and the vitality of the knowledge base by renewing it as it is recreated by individual learners.[10]

Criticisms of the theory

There have been those both within[24,25] and outside of medicine[6,17,26,27] who have pointed out the limitations and inherent tensions of communities of practice as a theory underlying educational practices. The most telling of these support Bourdieu's[28] observation that social structures tend to reproduce themselves, perpetuating existing hierarchies, power structures, and inequities. One observer has referred to "self-deluding and self-reinforcing social behavior" that can take place within communities of practice.[29]

Without question, these are valid comments on the behavior of the medical profession, whether it is referred to as a community of practice or not. Historically, the profession has been exclusionary, with women and virtually all categories of minorities having difficulty accessing the community.[30–32] Medicine has established and continues

to establish clear boundaries around the community that determine both inclusion and exclusion[31,33] and has a well-established internal hierarchical structure and power relationships.[31,33]

Without in any way diminishing the significance of the perceived shortcomings of communities of practice, it should be pointed out that the behavior patterns mentioned above are characteristic of most social structures,[9,28] including the medical profession,[31] and that they existed long before Lave and Wenger invoked the term *communities of practice*. Thus, leveling this criticism at communities of practice as an educational theory is appropriate in both generic and specific terms.

However, it is not possible to envisage any enterprise as complex as the medical profession without boundaries, hierarchies, or power structures.[6] It is the nature and impact of these essential elements that sometimes deserve criticism and attention, not their existence. Those designing educational interventions using communities of practice as a theoretical framework must be aware of the potential negative impacts of the community on the individual and community and take action to minimize them.

Some of these limitations have been addressed directly. Despite persistent inequities, the medical profession is now more inclusive of women and minorities[15,30] and has more understanding of the impact of different cultures on the value systems of its communities of practice.[34] The presence of medicine's hierarchies and internal power structures has been both recognized and questioned.[30–32,35]

An additional criticism stems from the tension that arises between the imperative to impose the norms and standards of the community and the desire of individuals to maintain important aspects of their own identities as they move toward full participation.[33,35] It has long been recognized that tension is an inevitable consequence of major changes in identity. Erikson[36] believed that an individual must actually suppress a portion of his or her identity to achieve change, while others suggest that "identity dissonance" can result.[33] Medicine's power relationships and hierarchical structure can make it difficult for individuals to maintain important aspects of "who they are."[15,33,37] As this has been recognized, widespread agreement has emerged that learners must be permitted to preserve and further develop their personal identities as they become professionals.[15,33,35]

Communities of Practice and Other Learning Theories

Proposing that communities of practice can be adopted as the theoretical base of medical education does not in any way affect the validity or usefulness of other theories. It is our belief that communities of practice can serve as the foundational theory and that other learning theories provide the theoretical base for the multiple educational activities that take place within a community of practice. In this way, learning theories can be used in their proper context, contributing to the creation of an integrated theoretical approach to medical education. In suggesting this, we expand on the work of Kaufman and Mann[2] in their review of learning theories in medicine in which they proposed that an advantage of situated learning theory is its ability to relate to and incorporate other learning theories. We believe their approach to be correct but that, as situated learning takes place within a community of practice rather than the reverse,[5,20,29] it is communities of practice that should be the organizing theory.

An example of a theory that can be integrated into communities of practice is workplace learning. Learning and work converge as learners in medicine proceed through the educational continuum, moving from the classroom to the workplace of the practicing physician—the medical ward, the operating room, the clinic, or the doctor's office. Billett's[19,38] theory of workplace learning, which he places within communities of practice, contributes to and strengthens the theoretical power of communities of practice.

Other learning theories can be helpful in understanding the many aspects of medical education that take place within the learning community.[2–4,12] Mentors and role models have long been understood to be fundamental to the transformation of an individual from a member of the lay public to a skilled professional.[6,39] Bandura's[7] social cognitive theory helps to explain this complex activity and can guide educational initiatives aimed at improvement. Experiential learning is also fundamental to medical education, leading to the acquisition of both explicit and tacit knowledge. Kolb's[40] experiential learning theory, along with Eraut's[41] analysis of tacit learning, provide a basis for understanding a central part of the educational activity that takes place within communities of practice. Both can be readily accommodated within the theoretical approach of communities of practice, as they have the capacity both to explain and also to guide the actions of learners and teachers.

Implications for Curricular Design

Communities of practice in medicine have always existed,[5] and physicians have been educated for millennia, during which time a host of educational strategies have been developed and implemented. Adapting modern medical education based on the theory of communities of practice will not necessarily result in radical curricular change. However, a major advantage of such a shift is that it would emphasize the social nature of learning and would be robust enough to serve as a framework around which both traditional and new educational strategies, with their theoretical underpinnings, could be structured throughout the continuum of medical education. Moreover, reorienting relevant activities around communities of practice has the potential to establish clearer educational objectives and better align strategies with objectives.

Learning in medicine occurs in a curriculum that includes formal components and experiences centered in the medical workplace. Experiential, or informal, learning[2–4,6,38,41] predominates as learners progress from laypersons to professionals and from the periphery to the center of the community. While there are frequent references in medical education to the impact of the informal curriculum,[42] it must be stressed that "workplace experiences are not 'informal'"[38] or "ad hoc,"[41] even though, as in all areas of the curriculum, unplanned and ad hoc experiences can occur. Workplace experiences are solidly grounded in the nature of medical practices, and these practices shape the conduct of both the work and the learning that take place.[20] Formal knowledge is transmitted, but because of

the social nature of the learning, much knowledge transfer is informal, leading to the acquisition of both explicit and tacit knowledge.[19,41]

Reorienting a curriculum so that it has a theoretical base grounded in communities of practice can involve different interventions. These include recognizing that medicine constitutes a community of practice and making the concept an explicit part of the cognitive base that is taught. Activities that have traditionally been used to encourage the incorporation of the values and norms of the community can be reoriented to become congruent with the theory. Finally, new activities necessary for curricular renewal can be developed.

The following recommendations for the initiation or reorienting of specific curricular activities are based on experience gained within the medical profession,[2–4,12,16,43–46] our personal experience,[43,44] and information drawn from the literature on learning theories.[5,6,8,10,17–21,38,47–50]

Acknowledge medicine as a community of practice

Lave and Wenger's work on communities of practice, including the acquisition of a professional identity, and Billett's elaboration of the concept of workplace learning, stress the importance of intentionality, alignment, and continuity as foundational elements in curricular design.[6,48,50] All of these require formal acknowledgment that medicine is a community of practice. By clearly recognizing this, the intent of the faculty becomes evident to both learners and faculty members. Intentionality and alignment are clearly linked. Intentionality dictates that curricular design should be based on objectives that are congruent with the theory. Alignment suggests that educational strategies should be aimed at assisting learners as they move to full participation in the community of practice and the acquisition of a professional identity. Continuity is provided by the nature of the "practice" within medicine's "domain"[20] and by the presence within the community of individuals at all levels of experience from novice to expert. In addition, the activities that occur throughout the continuum of medical education constitute the principal aim of the work and learning within the community, and they contribute to a sense of continuity. These activities include the acquisition of the knowledge, skills, and values necessary for the practice of medicine and the development of a professional identity.

Make communities of practice an explicit part of the curriculum

If something is to be taught, learned, and assessed, the educational objectives must be clear and the subject must be defined.[40] This is also related to the guiding principles of intentionality and alignment. We and others have recommended[16,45,46] that the support of individuals as they develop their professional identities become an objective of medical education addressed explicitly in the curriculum. Inherent in this recommendation is the necessity to formally teach the nature of professional identity and an explication of the process of socialization. We have termed this the "cognitive base."[44] To this base we now add the concept that medicine is a community of practice and that professional identity occurs in this context. Learners should understand the nature of the journey from peripheral participation to full participation if they are to be truly engaged in a process of collective learning.

Engage students in the journey from peripheral to full participation

As a part of the movement to support professional identity formation, engaging students in joining the community and in the development of their own identities helps them to better understand their personal journeys from laypersons to professionals.[12,15,33,44,46] Participation, which has always been implicit, becomes formalized, requiring conscious action on the part of the learner.[40] The norms on which a professional identity is constructed are determined by the community of practice[5,19] and by society through an ongoing process of social negotiation.[51] Moving from legitimate peripheral participation to full participation describes the move from "outsider" to "insider,"[31] and understanding this can assist students and their mentors in following the learners' progress.

Engagement and participation are also foundational elements of communities of practice[6,17] and workplace learning.[47,48] Participation "provides the constitutive texture of the experience of identity."[19] If learning is perceived to be a social activity, it does not occur without participation in the community.[19,49] The voluntary act of becoming a peripheral participant is a necessary first step in engagement. Participation, or coparticipation,[19] with fellow learners and more senior members of the community in the many activities within the community deepens the sense of engagement.[41]

Educational activities designed to promote engagement should create a balance between transmitting explicit knowledge about the nature of communities of practice and activities in which the knowledge learned is used in authentic contexts.[29,52]

Create and maintain a welcoming community

Medicine's community of practice has not been created intentionally. According to theory, it emerged as a result of the activities taking place within the community.[53] Learning in communities,[6] as well as workplace learning,[48] is encouraged by "fostering access to and membership in the target community and of practice."[53] As a further extension of the principle of intentionality, this goal should be pursued explicitly with both faculty and students.

In their original article, Lave and Wenger[5] pointed out the dynamic nature of the composition of a community of practice and the relationships between individuals and groups within the community. The composition of a community is in constant flux as new individuals join it, others move from junior to senior status, and "old timers" leave. Teaching is not based on traditional dyadic relationships but instead on an ever-changing "richly diverse field of essential actors" who populate the health care system and its learning environments.[5] While individual effort on the part of the learner is required, the community, including fellow learners and established members, has a powerful impact on learning and identity formation.[33] The community constantly recreates itself, and its future is dependent on its knowledge base being transferred to another generation.

The limitations of the theory of communities of practice and the negative

impact of some aspects of medicine's behavior as a community[29–32] must be acknowledged and must lead to action if the community is to be welcoming. The community must be inclusive of all involved in the enterprise and be welcoming to those at the periphery, who represent its future. Particular attention should be paid to those who have traditionally been excluded from medicine's community because of gender, sexual orientation, socioeconomic status, or other factors.[30–33] In addition, learners must be permitted to participate in the development of their own professional identities while maintaining their own personal sense of "self."[33,35]

Learners' engagement and participation should be actively supported throughout their educational experiences. This can be accomplished in several ways. The learning environment is fundamental and should be respectful, welcoming, and supportive.[6,33] Addressing the negative aspects of the informal curriculum as defined by Hafferty and Hafler[42] becomes doubly important, as a flawed learning environment inhibits learning and diminishes the sense of belonging of all involved.[33] Access for all learners to activities appropriate to their level must be assured, along with guidance from "experts"[39] who are responsible for providing the contextual framework within which learning takes place.

Finally, purposely structured social events, both within and outside of the workplace, can foster a sense of belonging, as can the rituals that have long been associated with the medical profession.[15,33,49,54] It is noteworthy that such activities have an influence on all members of the community from novice to senior.[15,33]

Explicitly address the major factors influencing professional identity formation

While many factors can have an influence on the journey from peripheral participation to full membership in a community of practice and the acquisition of a professional identity, there is general agreement that role modeling and experiential learning, both of which require reflection for their maximum impact, are the most powerful.[2,4,5,7,15,41] Each exerts its influence through conscious and unconscious means,[4,5,7,55–58] leading to the transfer of both explicit and tacit knowledge. The impact on learners is enhanced when explicit objectives are established[55,57] and when they are accompanied by guided reflection on their experiences.[55–57]

Role models and mentors. Role models and mentors have a central role in transferring both explicit and tacit knowledge to learners.[4,6,7,39,42,55,56] For this reason, conscious action should be taken so that a proper balance between formal instruction and experience in authentic situations is established.[29] Role models and mentors must be aware of and transmit, in a formal fashion, knowledge about the nature of communities of practice and their norms, and should actively support the acquisition of a professional identity within the community.[15,58] Their fundamental role in the transmission of tacit knowledge must be both recognized and supported.

The sharing of tacit knowledge requires experiences that include joint activities and physical proximity between teacher and learner or between learners functioning within the group.[5,19,20,49,50] The process of socialization is dependent on these work activities,[33] as is learning in the workplace.[19] Tacit knowledge can be converted to explicit knowledge—or reified—prior to its transfer. Again, conscious decisions must be made as to which curricular material will remain tacit and which will be made explicit and comprehensible to others.[18,41]

Experiential learning. Experiential learning, or learning by doing, is a concept that can be traced to Aristotle.[59] Inextricably linked to reflection,[4,55,56] it is essential to the acquisition of both the knowledge and skills as well as the professional identity of a physician.[5,15,33] Kolb's[40] model of experiential learning proposes that each individual goes through a cycle that begins with a new experience and proceeds to reflection, conceptualization, and active experimentation. The curriculum must ensure that learners have access to authentic experiences so that this cycle of learning can occur.[19,38] Through reflection, much that has been tacit in the past will be made explicit. However, there is a limit to the amount of tacit knowledge that can be made explicit,[41,60] and the impact of tacit knowledge is substantial.[12]

Reflection. Reflection, whether instigated by role models or following a variety of experiences, is described as the process by which we examine our experiences in order to learn from them.[56,60] Reflection requires individuals to assume the perspective of an external observer,[61] examining their own progress toward participation in the community. In the process, they have an opportunity to make explicit many aspects of both communities of practice and identity formation.[61] In addition to learning from their own personal experiences, individuals can become aware of their own "location" in the journey toward full participation in their community of practice.[19] Deeper reflection is stimulated by complex problems and issues[55] that give learners an opportunity to understand their own personal beliefs and values and integrate them into their professional identities.[58] Finally, if learning is regarded as a social activity, reflection is best done within small groups[55,61] rather than as a solitary activity.[12] It is important to establish situations where collaborative learning can take place, stressing collective problem solving.[29,53] Shared reflection offers the learner the opportunity for multiple perspectives and sources of information.[55]

Educational interventions should include activities that ensure that faculty members, role models, and mentors are aware of and communicate the nature of communities of practice and identity formation. Access for all learners to a range of authentic activities should be made available, including the allocation of responsibility appropriate to their level.[19] Importantly, both scheduled time and informal opportunities to reflect after role modeling and workplace experiences must be present at regular intervals in the curriculum.[55,56]

Provide faculty development

It is now well understood that major curricular change is dependent for its success on faculty development,[62] and introducing the concept of communities of practice requires particular attention.

Experience gained in faculty development for professionalism can serve as a guide,[62] as can early efforts in faculty development for professional identity formation.[63,64] It has been found that the subject

must be addressed explicitly for faculty and defined in easily understandable terms.[63,64] Faculty should know the concepts, be familiar with the vocabulary, and be given an opportunity to participate in planning major curricular interventions. Of particular importance to the development of expertise in communicating identity formation and communities of practice is that faculty have an opportunity to examine and reflect on their own identities and places within the community, reinforcing their personal sense of self and community.[64] Emphasizing the fact that medical educators also belong to a community of practice with its own norms, values, and sense of belonging[65] has the capacity to increase both their understanding of their role and their personal engagement.[64]

Chart progress toward full membership

The literature on communities of practice is clear: The establishment of standards and the assessment of competence are carried out within the community,[19] and novices and full members are accountable to the medical community.[21] While learners wishing to join the community have some latitude in negotiating their compliance with some standards, other standards, such as honesty, integrity, caring, compassion, and respect for others, are so fundamental to the existence of the community that they are nonnegotiable.[6,15,54] Therefore, when membership in medicine's community of practice becomes an educational goal, some method of charting progress toward this goal is necessary. Because joining medicine's community of practice is indivisibly linked to the acquisition of a professional identity, progress toward membership in the community can be gauged by measuring progress toward "thinking, acting, and feeling like a doctor."[1] Assessment is complicated by the fact that individuals move from peripheral to full participation in the community at different rates.[7,20,21,54] Some methods are available to assess the status of a professional identity, but their feasibility on a large scale is still questionable.[66,67] Because the presentation of self is so central to professional identity,[33] self-assessment has been determined to be important.[66–68] An individual's assessment of his or her progress toward "feeling like a doctor," carried out in collaboration with a mentor, is an important stimulus for reflection, and feasible methods of doing so are available.[68] Positive feedback about progress is an important factor in the development of a professional identity, engendering a feeling of confidence and a sense of belonging.[12,15,33,53,54] Of equal importance is the identification of individuals whose move from the periphery to the center of the community of practice is impeded. They require guidance and support.[68,69]

The Promise of Communities of Practice

As we mentioned earlier, we believe that medicine is, and has always been, a community of practice. From a pragmatic point of view, the theory of communities of practice, supported by other learning theories, has the capacity to provide a comprehensive theoretical basis for medical education, something that we do not believe exists at the present time. Linked with an understanding of the nature of medical knowledge and identity formation, it can help both learners and educators to better cope with the complexity of medical education. Of significance, communities of practice can serve as a guide to the development of interventions designed to make the educational process in medicine more effective.

We close with a quote from Dornan et al[70] that we believe to be appropriate:

> Expertise is not simply a property that passes from teacher to learner, but a dynamic commodity that resides within communities of practice; learning, according to the theory, is a process of absorbing and being absorbed into the culture of such a community.

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R.L. Cruess is professor of surgery and a core faculty member, Centre for Medical Education of McGill University, Montreal, Quebec, Canada.

S.R. Cruess is professor of medicine and a core faculty member, Centre for Medical Education of McGill University, Montreal, Quebec, Canada.

Y. Steinert is professor of family medicine and director, Centre for Medical Education of McGill University, Montreal, Quebec, Canada.

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