

Students as Evolving Professionals: Turning the hidden curriculum around through the threshold concept pedagogy

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Abstract:

Students in professional training programs enter their program knowing what they will be trained “to become” (e.g. training in medicine to become a doctor). Many different “signature pedagogies,” such as clinical teaching, case-based discussion, have been advocated to teach professional education. Yet, graduates of professional training programs are often deemed ill-prepared for the real world, despite possessing exceptional knowledge and technical fineness. This paper aims to explore the connections between the hidden curriculum, threshold concepts and students as evolving professionals, and propose a multi-perspective approach for the transformation of students into work-ready professionals. The proposed approach encourages the development of professionals who not only “perform” like professionals as an end product of professional education, but who are professional – distinguished in their “ways of thinking and being,” an evolving professional during training and a professional who continuously evolves in pursue of excellence upon graduation.

Key Words:

Threshold concepts; Hidden curriculum; Evolving professionals; Student engagement; Professional development.

Introduction

The transformation from students as part of the lay public to being professional, once thought best learnt by mimicking respected role models, is being re-examined. In addition, professionalism is being re-defined and better articulated in many disciplines. In health professional education in particular, educators are beginning to consider the importance of recognizing students as evolving professionals (EP) The relevance of

socialization and professional identity, for the optimization of student learning and professional development are now being taken into consideration.

The EP concept (Tsang, 2010) was proposed as a multi-level scholarship of teaching and learning (SoTL) framework. In this context, SoTL refers to scholarship in multiple aspects of teaching and learning. Scholarship is defined broadly as efforts that systematically and critically lead to improvements, advancements and innovations. SoTL as defined by the EP concept examines, evaluates and investigates students' ways of learning, teachers' ways of teaching, personal and professional development, the design of the curriculum and the underlying pedagogies and philosophies. Students and teachers work together in a community of scholars and scholarship is developed through critical reflections, self-evaluations, peer reviews, iterations and dissemination of findings and outcomes (Schulman, 2010). EP recognizes students as evolving professionals within a supportive culture; in which learning, professional socialization and professional development progress in a discipline-specific "ways of being a professional" model. In this way, transformation occurs individually, collaboratively, professionally and socially. The EP concept further recognizes that identity affects experiences, contexts, attitudes, confidence, motivation, relevance, self-efficacy and learning. Moreover, the EP concept acknowledges that learning, in turn, affects identity and ways of thinking, knowing and being.

The EP concept shares similarities with Shulman (2005)'s signature pedagogies, which aim to prepare people for a particular profession through engaging them "*to think, to perform and to act with integrity*" (p.52) and by "*implicitly defining what counts as knowledge in a particular field*" (p.54). Both signature pedagogies and the EP concept aim to make a difference to student learning. For example, both endeavour to form "*habits of the mind, habits of the heart and habits of the hand*" (p.59), and both provide opportunities for early professional socialization. However, unlike the EP concept, signature pedagogies tend to focus only on one aspect of the profession – the signature aspect, at the expense of other aspects of being a professional. This is illustrated by Shulman using medical education as an example. In medicine, bedside teaching is the signature pedagogy which focuses on teaching students "to perform" like a doctor to examine clinically, diagnose and manage patients' medical conditions, and little is done about teaching students to "act with integrity" (Shulman, 2005).

The EP concept focuses on multi-perspective development of students under three identities: students as reflective practitioners, skilled communicators and collaborative team members. The rationale for singling out these professional attributes or identities as priorities rests upon the belief that if these are mastered, in addition to in-depth knowledge and skills in their professional field of study, the development of other professional attributes would occur overtime.

Tsang (2010) mentioned that "the EP concept provides a context for unravelling threshold concepts and the hidden curriculum associated with the ways of being evolving health professionals and specified that threshold concepts and hidden curriculum could be referred to synonymously as 'concepts that are central to that discipline's way of constructing knowledge and viewing the world...and...provide a doorway through which other ways of thinking, understanding, interpreting, or viewing something without which the learner cannot progress'" (Meyer & Land, 2003 & 2005).

Moreover, professional socialization and professional development were regarded as “threshold concepts” that needed to be better addressed and made more explicit.

In adding to the development of the scholarship of learning and teaching within health professions, this essay aims to further explore the connections between the hidden curriculum, threshold concepts and students as evolving professionals, and propose an approach to further prepare and develop students to become work-ready professionals.

Hidden curriculum

In health education, student learning generally is comprised of three core aspects: theoretical knowledge and skills, clinical or practical competence, and professional and ethical standards, which together provide the necessary foundations for developing students into professionals. Hafferty (1998) suggested that these are interrelated and learnt within multi-dimensional learning environments consisting of

- Formal – “the stated, intended and formally offered and endorsed curriculum”
- Informal – “an unscripted, predominantly ad hoc, and highly interpersonal form of teaching, learning and modelling”
- Hidden – “influences that function at the level of organisational structure and culture” which include assumed expectations, unintended learning outcomes, professional socialization.

Crudely, the hidden curriculum could be described as the aspects of a profession that students are not taught but which they learn and are influenced by along the way. The hidden curriculum refers to a wide variety of concepts and domains that are not “core curriculum.” Although not explicitly taught to students, aspects encompassing the hidden curriculum are assumed to develop as the natural by-product of tertiary education, primarily through meaningful interactions with different people and different environments (Jayne et al., 2005; Browning et al., 2007). For example, Ozolins et al. (2008) in their study of medical students’ views of the hidden curriculum found that it refers to “learning how to behave like a doctor...how to be and think like doctors” (p. 608).

The hidden curriculum also includes the learning gained from each training institution’s distinguished organizational, structural and cultural influences and the insights gained from the behaviours and attitudes of teachers and administrators (Longstreet & Shane, 1993; D’eon et al., 2007; Ozolins et al., 2008). The implicitness of the hidden curriculum renders it troublesome and difficult to ascertain in terms of assessment, learning outcomes and competencies. The most common domains referred to as hidden curriculum in the health sciences relate to professionalism, socio-cultural impact, role modelling and human connections, leadership, ethics, and aspects of developing students as professionals – in particular, the ways of thinking and being a professional (Hundert et al., 1996; Jayne et al., 2005; Masella, 2006; Browning et al., 2007; Ozolins et al., 2008). In the words of Wenger (1998, p.215), the hidden curriculum may be thought of as contributing to the processes of professional socialization and ontological transformation: “Because learning transforms who we are and what we can do, it is an experience of identity. It is not an accumulation of skills and information, but

a process of becoming - to become a certain person, or conversely to avoid becoming a certain person”

From the educator perspective, the hidden curriculum has been regarded as providing the linkages between professional training, professional practice and professional success (Masella, 2006; Ozolins et al., 2008). Some educators speak of the hidden curriculum as being “the mortar that binds the bricks of formal learning” (Masella, 2006). Others refer to the hidden curriculum as the fundamental elements within which knowledge and skills find meaning (Tsang, 2010). Yet, its hidden nature poses a stumbling block for students’ transformation into competent health professionals (Hundert et al., 1996; Kassebaum & Culter, 1998; Caldicott & Faber-Langendoen, 2005; D’eon et al., 2007). From the student perspective, the “hidden curriculum” offered the “crux” of becoming the professional they aspire to be and thus is perceived as valuable (Ozolins et al., 2008). Yet, students also perceive the hidden curriculum as less important in terms of assessment and grades because it is “assumed knowledge” and “often not assessed although it ought to be” (Ozolins et al., 2008).

Educators have struggled with the hidden curriculum. On the one hand, educators who advocate formalizing of the hidden curriculum reason that by making the implicit explicit the tacit knowledge and the cultural understanding affiliated with a particular profession would be made more accessible and assessable (Jayne et al., 2005; Tsang, 2010). Thus, student learning would be enhanced and optimized. On the other hand, the opponents reason that there are considerable risks in making the implicit explicit, including the risk of reducing the essence of a professional to rules and standards and limiting students’ own interpretations of the ways of being a professional. Still others argue that the hidden curriculum should be taught but assessment of these aspects of professional education would be difficult, if not impossible. Moreover, the difficulties associated with assessing professionalism in health professional education programs may cause “learners to develop misconceptions regarding their importance” and “impact the ability to identify professional attitudes and behaviours that ultimately affect performance and the quality of patient care” (Hawkins et al., 2009, p.348).

Threshold concepts

The notion of “threshold concept” was originally proposed by Land and Meyer (Meyer & Land, 2003; Land et al., 2005; Meyer et al., 2006). The term “threshold” refers to a portal to which and from which discipline-specific learning and understanding may be facilitated. The term “concept” refers to representations, perceptions, domains and abilities which constitute knowledge and learning. It is seen as the way by which previously inaccessible ways of thinking and knowing are made accessible, leading to the type of understanding, integration and transformation that render deeper learning and mastery possible. According to Meyer and Land (2005), each discipline possesses threshold concepts that integrate and define the scope of the community of practice within which students engage in and learn from. Without a grasp of the threshold concepts in a particular field, the learner cannot fully progress and “become.” Conversely, in grappling with and comprehending threshold concepts, learners are metaphorically able to go through a portal to “a transformed internal view of subject matter, subject landscape, or even world view” (Meyer & Land, 2005, p.373). These

higher insights and transformed perspectives are crucial for the development of their discipline-specific ways of thinking, knowing and being. Every discipline has threshold concepts that, unless understood by students, form a barrier for students to gain mastery of the subject and therefore must be tackled. Threshold concepts thus could be described as a distinct type of core concepts (Meyer & Land, 2003), ones in which “epistemological transitions” (advances in knowledge and knowing) and “ontological transformations” (development in the ways of being) (Meyer & Land, 2003 & 2005) are both emphasized:

“Grasping a threshold concept is transformative because it involves an ontological as well as a conceptual shift. We are what we know. New understandings are assimilated into our biography, becoming part of who we are, how we see and how we feel.”(Cousins, 2006, p.4)

However, not all core concepts are threshold concepts. Moreover, not all threshold concepts are easily made explicit. The identification and exploration of threshold concepts may pose a challenge. To assist with the identification of threshold concepts, Land & Meyer (2005) proposed that threshold concepts are characterized as being transformative, reconstructive, troublesome, irreversible, integrative, bounded, discursive and luminal (Land et al., 2005 & 2008; Meyer et al., 2006; Cousins, 2006):

Transformative

Student perspectives of a discipline are changed when threshold concepts are understood. Specialised knowledge and skills become more meaningful, which, in turn, enable other perspectives and principles to be connected and made sense of more easily. In so doing, understanding is transformed. Whilst core concepts are defined as building blocks amounting to deep understanding of a subject matter, core concepts generally do not lead to changed perspectives or transformed ways of thinking as do threshold concepts.

Reconstructive

Threshold concepts transform student perspectives by deconstructing and reconstructing existing knowledge in a way that entails greater and different understanding that initially may not be apparent.

Troublesome

Threshold concepts tend to be difficult for students to grasp. Often threshold concepts specific to a discipline are implicit and difficult to explain, rendering them difficult to teach and make explicit. Conversely, if such troublesome aspects are not overcome, they will pose a barrier for the development of profound understanding and mastery. The threshold concept of being troublesome relates well with what Perkins (1999) calls “troublesome knowledge” i.e. “knowledge that is alien or counter-intuitive or even intellectually absurd at face value.” Threshold concepts are not only troublesome knowledge in themselves but may lead to further troublesome knowledge that needs to be confronted by the learner.

Irreversible

Threshold concepts transform student perspectives permanently. The transformed perspectives are grounded and drive the way students gain understanding in all their future learning. It is difficult if not impossible to understand threshold concepts and remain stagnant in an understanding of a discipline. Land & Meyer (2006) utilized the analogy of Adam and Eve's exodus from the garden of Eden to illustrate this: "in knowing" after eating the fruit of the tree of knowledge of good and evil, the Adam and Eve's perspectives could never return to the "not knowing" state again.

Integrative

Threshold concepts, when understood by students, provide the elements required to connect and integrate previously divergent principles and seemingly unrelated perspectives.

Bounded

In being bounded, threshold concepts are discipline-specific; outside of the discipline, these concepts may not be threshold concepts and may not be relevant.

Discursive

Understanding the threshold concepts empowers students to grasp the discipline-specific "ways of thinking and being" by providing and extending a language, a philosophy and an origin, from which students can begin to discuss, interrogate, orientate and understand their learning.

Liminal

Threshold concepts may be likened to a "rite of passage" that involves complex exploration of knowledge, knowing and being that result from bounding back and forth between states of understanding, different understanding, misunderstanding, confusion, and realisation before transformation. The process is not linear. Students who enter the liminal space (a go-between state of certainty mixed with doubts) are on the way to mastery. In contrast, novice learners who know too little to doubt what they know, do not enter the luminal space. It is liken to the cliché "you know you are getting better, when you know what you don't know."

For example, in dentistry and oral health, students need to be able to select restorative materials for filling holes in teeth. Multiple aspects must be considered in order to select the most appropriate restorative material to suit a particular surface of a tooth, in a particular part of the mouth, in a particular patient with a particular set of risk factors and life circumstances. Students who do not grasp the fundamentals relating to critical analysis of material sciences including hardness, compressive strength, and setting reactions in the context of biopsychosocial considerations and risk-based assessment, may select their restorative materials based on uni-dimensional considerations such as aesthetics. This would render the long term prognosis of their restorations much less predictable and ultimately reduce the effectiveness of their treatment. In contrast, students who understand the threshold concepts of critical analysis and risk-based assessment are able to progress out of a framework of

protocols and rules to make choices based on multi-perspective considerations that make room for “going outside the square.” This is important as an exact “textbook patient” is rare in reality; therefore, students in health professional programs must be able to tolerate uncertainties and critically analyse the “atypical” through the lens and perspective of a health professional.

Moving from the hidden curriculum to threshold concepts

The hidden curriculum exposes “insider knowledge and understanding” and shares many similarities with threshold concepts. Hidden curriculum has been said to be troublesome and bounded, but when it is understood by students, it could lead to challenge one’s previous understanding, reconstruction and integration of different insights and perspectives and cause an irreversible transformation of their ways of thinking, knowing and being a health professional, thereby, enabling the transition from learner to professional.

Ironically, the hidden curriculum in most health professional programs is seen as peripheral to core concepts. The peripheral nature of the hidden curriculum within traditionally content-laden health professional training programs is, in itself, problematic as concepts that are considered part of the hidden curriculum do not receive adequate attention and therefore their potential to optimize students’ learning and professional development is not fully utilized. Furthermore, the hidden curriculum within traditional health professional programs supports an apprenticeship model of knowledge transfer: the experts conveying expected standards and competences to the learners and the learners displaying traits superficially without critical reflection and without necessarily internalizing these traits. In this way, the hidden curriculum mentality supports a positivistic view that mastery is attained when knowledge is transferred entirely to the learner. As such, the hidden curriculum fails to target the heart of the problem: enabling students to change their ways of knowing and thinking and empowering them to transform ontologically as well as conceptually.

In addition, the hidden curriculum has a generally negative connotation to it and has been accused of causing negative influences on the development of students’ self-efficacy, empathy and morality. For example, through the hidden curriculum, students may be exposed to unethical behaviours or emotional stress associated with harassment by supervising physicians and be confronted with the dilemma of “do what your teachers say, not what your teachers do” (Pololi & Price, 2000; D’eon et al., 2007; Pedersen, 2010).

In contrast, threshold concepts are portrayed as positive and supportive of student learning. Instead of being peripheral, threshold concepts are deemed essential and “without which the learner cannot progress” (Meyer & Land, 2003). Threshold concepts may be utilized to identify critical points in students’ learning when students are likely to experience obstacles in their learning and when transformative learning occurs (Land et al., 2005). In this way, threshold concepts are core to most health curricula. They precede basic mastery of discipline knowledge and are useful for unlocking discipline-specific perspectives. In contrast, the hidden curriculum has largely been viewed as extra-curricular and relevant only after “the basics” are mastered by the learners.

Considering concepts and aspects within the hidden curriculum as threshold concepts and utilizing the threshold concept pedagogy as a curriculum design approach or a frame of reference (Cousins, 2006) may empower educators to focus on guiding students in the aspects of learning that truly matter and enable students to learn how to learn as professionals of a specific discipline. After all, as Goldie (2008, p.514) aptly stated, “The ultimate aim...is to transform students...to become members of the profession; therefore requires to be woven into the fabric of the entire curriculum and must be considered by all concerned....”

Threshold concept has been described as the “less is more” curriculum approach (Cousins, 2006) that starts with identifying the tacit but important elements and making these known to students so that they have a grasp of the subject matter in an evolving professional manner. For instance, students begin to be “in the know” rather than just knowing; they become insiders, a part of the culture / professional, instead of being outsiders. When threshold concepts are understood, students are able to learn and develop through an insider’s lens (Land et al., 2005). Mastery of the hidden curriculum through threshold concepts enable students to connect knowledge and integrate skills knowledge and skills that before may have been perceived as unrelated or irrelevant. Threshold concepts as the basis of curriculum design aims to alleviate the potential of mimicry being mistaken as mastery and to ensure that what students know, are truly authentic, integrated and transformative. By considering the hidden curriculum in terms of threshold concepts, a new way of engaging students and developing students as evolving professionals will undoubtedly be revealed.

Transforming students as evolving professionals

Concurrently, in turning the hidden curriculum around using the threshold concept pedagogy, students are more able to be recognized and supported as evolving professionals. This, in turn, compliments the Evolving Professional concept (Tsang, 2010). The EP concept is developed to be collaborative and adaptive. By incorporating threshold concepts into the EP concept, tacit knowledge of a specific discipline is not only made explicit but transformative; the EP concept sets the scene and provides an overarching framework for the transformation of the learner to the professional threshold concepts, providing the fundamental elements from which epistemological transitions and ontological transformations occur (Meyer & Land, 2003 & 2005; Tsang 2010). By regarding the ways of thinking, knowing and being a professional as threshold concepts rather than hidden curriculum, tacit knowledge is not only brought into the open explicitly but also brought into the curriculum rather than considered peripheral. By replacing the hidden curriculum mindset with threshold concepts, learning takes on new meanings: both cognitive and affective aspects of learning are emphasized and the focus of the curriculum is shifted from teaching to learning (McLean, 2009). Rather than simply exploring learning in terms of the quantity of content, roles, identities, personal growth, beliefs and values are also considered in relation to learning, which, in turn, promote new insights and transforms understanding (McLean, 2009).

The threshold concept pedagogy is a useful and valid one in the context of developing students as evolving professionals. Within EP, the ways of thinking, knowing and being a health professional become threshold concepts. Thus, issues relating to

how best to determine which concepts are threshold concepts may be reduced. By replacing the hidden curriculum with articulated threshold concepts within the context of students as evolving professionals, deep authentic teaching and learning is emphasized and students learn to accept the dynamic and provisional nature of learning and understanding within a specific discipline. In doing so, positive enlightenment and transformation that significantly influences students' developing professional identity are made possible and made permanent.

The hidden curriculum emphasizes the transfer of expectations, focuses on being instructional and infers a degree of compulsory conformation of a professional from a particular discipline. The process of knowing within the hidden curriculum emphasizes retaining and applying knowledge consistently and appropriately. In contrast, the process of becoming a professional within the threshold concept pedagogy perspective emphasizes the identification of discipline-specific knowledge and perspectives as the foundation for exploration, self-discovery and professional transformation. Through critical reflection, mindfulness and deep consideration of multiple perspectives and interrogation, using threshold concepts as the starting point, students are better able to explore issues in depth. This furthers students' understanding through insightful inquiry, , connections and integration of seemingly unrelated issues, expanding their boundaries of knowledge and triggering new and continuous learning, relearning and unlearning., This is preferable to students simply taking on the persona of a professional. (Carstensen & Bernhard, 2008; Korosteleva, 2010). At the same time, it is important to consider the issues that this alternative approach will potentially raise, as its practice challenges established norms, boundaries, expectations and actions of students, educators and education institutions. For example, how will assessment be conducted? How will we measure competence? In encouraging self-discovery and self-evaluation as an evolving professional, will students become too self-centred and less altruistic? In bringing the hidden curriculum to the fore through threshold concepts and in the context of students as EP, how will the formal curriculum align and integrate? And what are the costs of implementing this broad change?

The process of thinking and knowing within the threshold concept pedagogy focuses on applying knowledge in such a way that it becomes the basis for further inquiry and the foundation for transformations in ways of being. In moving forward, the next steps will need to involve the purposeful identification of aspects of professionalism that were once considered a part of the hidden curriculum for specific disciplines i.e. the "microspheres" of the ways of thinking, knowing and being within the threshold concept pedagogy and the integration of these into the very fabric of the professional training curriculum – it will involve solving the how, the what and the why. Moreover, substantial efforts need to be placed in developing and evaluating learning activities that aim to empower students and educators to confront and unravel threshold concepts in the context of professionalism and the scholarship of teaching and learning. In acknowledging the need for a paradigm shift in developing students as evolving professionals within the threshold concept pedagogy instead of the hidden curriculum, new opportunities await. At the same time, a successful paradigm shift also requires challenges to be confronted and constraints to be considered. Are you ready?

References

- Browning, D. M., Meyer, E. C., Truog, R. D., & Solomon, M. Z. (2007). Difficult conversations in health care: Cultivating relational learning to address the hidden curriculum. *Medical Teacher, 82*, 905-913.
- Caldicott, C. V., & Faber-Langendoen, K. (2005). Deception, discrimination and fear of reprisal: lessons in ethics from third-year medical students. *Academic Medicine, 80*, 866-873.
- Carstensen, A-K., & Bernhard, J. (2008). Opening up the portal of understanding: Variation theory, key concepts, threshold concepts and critical factors for learning. In: Land, R., Meyer, J. H. F., & Smith, J. (Eds). *Threshold concepts within the disciplines*. Rotterdam: Sense Publishers.
- Cousins, G. (2006). In: J. H. F. Meyer & R. Land (Eds.). *Overcoming barriers to student understanding: Threshold concepts and troublesome knowledge*. London: Routledge.
- Cruess, R. L., & Cruess, S. R. (2006). Teaching professionalism: general principles. *Medical Teacher, 28*, 205-208.
- D'eon, M., Lear, N, Turner, M., & Jones, C. (2007). Perils of the hidden curriculum revisited. *Medical Teacher, 29*, 295-296.
- Goldie, J. (2008). Integrating professionalism teaching into undergraduate medical education in the UK setting. *Medical Teacher, 30*(5), 513-527.
- Hafferty, F. W. (1998). Beyond curriculum reform: Confronting medicine's hidden curriculum. *Academic Medicine, 73*(4), 403-407.
- Hawkins, R. E., Katsufakis, P. J., Holtman, M. C., & Clauser, B. E. (2009). Assessment of medical professionalism: Who, what, when, where, how, and...why? *Medical Teacher, 31*(4), 348-361.
- Hundert, E. M., Hafferty, F., & Christakis, D. (1996). Characteristics of the informal curriculum and trainees' ethical choices. *Academic Medicine, 71*, 624-633.
- Jaye, C., Egan, T., & Parker, S. (2005). Learning to be a doctor: Medical educators talk about the hidden curriculum in medical education. *Focus on Health Professional Education, 7*(2),
- Kasserbaum, D. G., & Cutler, E. R. (1998). On the culture of student abuse in medical school. *Academic Medicine, 73*, 1149-1158.
- Korosteleva, E. A. (2010). Threshold concepts through enactive learning: How effective are they in the study of European politics? *International Studies Perspectives, 11*, 37-50.
- Land, R., Cousins, G., Meyer, J. H. F., & Davies, P. (2005). Threshold concepts and troublesome knowledge (3): Implications for course design and evaluation. In: C. Rust (Ed.). *Improving student learning – equality and diversity*. Oxford: OCSLD.
- Land, R., Meyer, J. H. F., & Smith, J. (2008). *Threshold concepts in the disciplines*. The Netherlands: Sense Publishers.
- Longstreet, W. S., & Shane, H. G. (1993). *Curriculum for a new millennium*. Boston: Allyn & Bacon.
- Masella, R. S. (2006). The hidden curriculum: Value added in dental education. *Journal of Dental Education, 70*(3), 279-283.
- McLean, J. (2009). Triggering engagement in SoTL through threshold concepts. *International Journal for the Scholarship of Teaching and Learning, 3*(2). Accessed online 14 July 2009. URL: <http://www.georgiasouthern.edu/ijstol>.

- Meyer, J., & Land, R. (2003). *Threshold concepts and troublesome knowledge: linkages to ways of thinking and practicing within the disciplines*. Occasional Report No. 4, Enhancing Teaching-Learning Environments in Undergraduate Courses Project. University of Edinburgh, Coventry and Durham. Accessed online 14 July 2009. URL: <http://www.ed.ac.uk/etl>.
- Meyer, J. H. F., & Land, R. (2005). Threshold concepts and troublesome knowledge (2): Epistemological considerations and a conceptual framework for teaching and learning. *Higher Education*, 49(2), 373-388.
- Meyer, J. H. F., Land, R., & Davis, P. (2006). Implications of threshold concepts for course design and evaluation. In: J. H. F. Meyer & R. Land (Eds.). *Overcoming barriers to student understanding: Threshold concepts and troublesome knowledge*. London: Routledge.
- O'Brien, M. (2008). Navigating the SoTL landscape: A compass, map and some tools for getting started. *International Journal for the Scholarship of Teaching and Learning*, 2(2), July. Accessed online 14 July 2009. URL: <http://www.georgiasouthern.edu/ijstol>.
- Ozolins, I., Hall, H., & Peterson, R. (2008). The student voice: recognising the hidden and informal curriculum in medicine. *Medical Teacher*, 30, 606-611.
- Pedersen, R. (2010). Empathy development in medical education – A critical review. *Medical Teacher*, 32, 593-600.
- Perkins, D. (1999). The many faces of constructivism. *Educational Leadership*, 57(3).
- Pololi, L., & Price, J. (2000). Validation and use of an instrument to measure the learning environment as perceived by medical students. *Teaching and Learning in Medicine*, 12, 201-207.
- Shulman LS. (2005). Signature pedagogies in the professions. *Daedalus*; Summer: 52-59.
- Schulman L. (2011). The scholarship of teaching and learning: A personal account and reflection. *International Journal for the Scholarship of Teaching and Learning*, 5(1).
- Tsang AKL (2010). The Evolving Professional (EP) concept as a framework for the Scholarship of Teaching and Learning. *International Journal for the Scholarship of Teaching and Learning*, 4(1).
- Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. Cambridge: Cambridge University Press.