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Exploring the Pressures of Medical Education From a Mental Health and Wellness Perspective

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Chapter 4

Medical Student Burnout: A Social Cognitive Learning Perspective on Medical Student Mental Health and Wellness

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ABSTRACT

Medical students' mental health is a topic of great interest as it has implications not only for medical students but also for the patients of these future doctors. Medical students face many academic pressures and burnout is one possible consequence of these stressors with some studies suggesting that burnout affects up to 50% of medical students. Our own study of American students in a medical programme located outside of the U.S. showed that student perceptions of the medical learning environment were linked with burnout suggesting that reducing burnout requires a pedagogical approach that addresses academically related stress factors. This chapter contends that one institutional strategy to prevent problems such as burnout is to adopt a theory-based approach to instructional design that addresses the causes of medical student stress and burnout from the instructional side.

INTRODUCTION

Burnout has been described as 'a psychological syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who work with other people in some capacity' (Galan et al., 2011).

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Grounded in the realities of people's experiences Maslach's Burnout Inventory, which has been recognized for more than a decade as the leading measure of burnout, defines three dimensions of burnout. The three dimensions, Emotional Exhaustion, Depersonalization and Personal Accomplishment are related to environmental variables in different ways. Exhaustion and cynicism tend to emerge from school overload and social conflict while a sense of inefficacy arises from a lack of resources within a situation (Maslach, 2003). Maslach's theory states that burnout occurs when people lose a sense of positive connectedness with others and have a loss of shared values among peers (Maslach, Schaufeli, & Leiter, 2001).

Medical student burnout can be a predictor of depression, low self-esteem, school attrition and suicidal ideations (Chang, Eddins-Folensbee, & Coverdale, 2012) and has also been associated with intention to leave medical school and unprofessional behaviour (Dyrbye, et al., 2010). In a study conducted by the Mayo Clinic, with participants from seven U.S. medical schools, 53 percent of medical students, had symptoms of burnout. In a series of studies Dyrbye and her colleagues (Dyrbye, et. al, 2009, 2010, 2012) showed how burnout was associated with self-reported unprofessional conduct and less altruistic professional values among other problems.

Emotional exhaustion may lead to physical neglect, which decreases empathy and can directly affect patient care. Emotional exhaustion and loss of focus may also be the reason doctors have a higher suicide rate than the general population (Dyrbye et al., 2010). Lupo and Strous (2001) showed higher levels of anxiety among medical students in the preclinical years than the clinical years. Alternately, conflicting research cited by Rosenthal and Okie (2005) showed higher levels of anxiety in the clinical years. The conflicting data can be attributed to different types of stress factors making each phase a new learning opportunity to reflect on stressors and acknowledge symptoms.

A current thread in medical education research has examined clinical empathy and its relationship with burnout (Dyrbye et al., 2010; Hojat et al., 2004). Empathy is a universal foundation of the future physician-patient relationship (Matthews, Suchman & Branch, 1993) that promotes diagnostic accuracy, patient adherence to treatment plans and physician satisfaction (Derksen, Bensing & Largo-Janssen, 2013). Research into empathy and professional burnout has demonstrated that physicians tuned into the psychosocial needs of their patients were less likely to experience burnout (Anfossi & Numico, 2004), that empathy levels are negatively correlated with burnout (Wilczek-Ruzyczka, 2011) and that burnout is a factor with significant influence on self-assessed empathy among medical students (DiLalla, Hull & Dorsey, 2004). It has also been shown that self-perceived empathy declines significantly during the course of medical school as a result of increased contact with patients in the clinical phase of training (Neumann et al., 2011).

The capacity for empathy is important for establishing interpersonal relationships, which is crucial in the medical field where clinicians need to establish both general interpersonal relationships and doctor–patient relationships (Park et al., 2006). Within an empathetic relationship, patients talk more about their symptoms enabling the physician to collect more data and determine a more accurate diagnosis (Derksen, Bensing & Largo-Janssen, 2013). By finding a common ground between doctor and patient, trust is built, the emotional experience is recognized and the patient is able to become an active participant in the treatment (Gelhaus, 2012). Empathic communication enables patients to talk more comfortably which leads to a more accurate diagnosis and an agreeable treatment plan between physician and patient (Coulehan, et al., 2001).

Cohen, Kay, Youakim and Balacius (2009) write that empathy requires attentive listening and that empathic listening within a healthcare setting involves a higher emotional burden than what a student may have previously encountered when providing assistance in another environment. Students’ discomfort at the harm they and their teachers can do to patients creates a tension between their feelings of empathy and the burnout they may experience within the medical school-learning environment.

A goal of this chapter is to demonstrate that if learning environment perceptions are associated with burnout then efforts to address these factors through theory-based instructional reform can create an environment in which burnout is addressed and assessed within a pedagogical framework. Research in medical education has pointed to two major stress-related problems for medical students. One is the stress created through academic pressures and the other is associated with social aspects of medical education. This chapter will suggest theory-based pedagogical changes in the medical school-learning environment that can address these problems and hence, reduce burnout.

A Study of Burnout, Empathy, and Perception of Learning Environment

Burnout has been demonstrated among American medical students studying in the U.S. (Dyrbye, et al., 2014) and among international medical students studying in their respective countries (Muzafar, et al., 2015; Cecil, McHale, Hart & Laidlaw, 2014). As clinical empathy has been shown to be a major beneficial factor in patient care and burnout appears to be related to the reported decline of empathy among medical students, understanding the learning environment factors related to this relationship can offer possible insights into methods that might decrease burnout in medical students.

A study of students in an international medical school programme was conducted to explore the associations between student perceptions of the learning environment

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and burnout. In 2014, an email survey was sent to a sample of 120 men and women medical students in an international medical programme. The identical survey was sent two times during the year at the beginning and towards the end of the academic semester. Two dimensions of burnout were measured using validated single items from the Maslach Burnout Inventory. Participants responded using a 7-point Likert scale (1=daily, 7=never) about how often he or she felt ‘burned out from my work’ (for emotional exhaustion) or ‘callous toward people’ (for depersonalization).

The Dundee Ready Educational Environment Measure (DREEM) (Alshehri, Alshehri, and Erwin, 2012) provided questions related to student perceptions of several aspects of the learning environment including self-perception about learning, student self-perception of teachers, academic self-perception, perception of atmosphere and their social situation. The DREEM was developed as a universal diagnostic inventory for assessing the whole or parts of the educational environment and climate of medical schools (Roff, et al., 1997) and is the most widely used instrument for the evaluation of medical and healthcare related courses (Alshehri, Alshehri, and Erwin, 2012).

DREEM Sub-Scales

The Student Perception of Learning sub-scale helps provide insight into the learning process and focuses on the learning style of the student. Sub-scale statements ask the student to rate their perception of learning time, focus, emphasis and confidence as well as their understanding of course objectives and class participation. The perception of learning demonstrates the operating values and beliefs of the student. A stronger self-perception is linked to a more positive self-concept (Weiner, 2000), which can be linked to a more productive learning experience.

The Academic Self-Perception sub-scale indicates how students feel about their learning environment (Alshehri, Alshehri, and Erwin, 2012). Strong positive responses can be linked to student learning as a strong connection exists between an individual’s efforts and their performances (Koparan, Şahin, and Kuter, 2010).

The Perception of Teachers sub-scale measures the confidence the student has in faculty teaching, style, mannerism and delivery. Examples of these sub-scale statements include: ‘The teachers give clear examples’, and ‘The teachers are knowledgeable’. Analysing the perception a student has of teachers provides a measure of connectivity to the faculty, which can be correlated with a student’s level of academic success or failure.

The medical school-learning environment integrates classroom instruction, clinical practice, and social/professional identity formation while being impacted by the personal experiences of each student. The DREEM’s Social Self-Perception subscale measures the way a student perceives their learning and development.

Certain products of professional education occur through a socialization process that crystallizes into behavioural norms and culturally appropriate beliefs. This deliberate but less conscious habitus of practice shapes perception and skilled practice (Bourdieu, 1990). The social context is important to understand when analysing learning and development of medical students.

The Jefferson Scale of Empathy

Research using the Jefferson Scale of Empathy with different classes in a medical programme has been used to demonstrate the need for a comprehensive educational approach to empathy. In this study, the Jefferson Scale of Empathy –Student Version was used to measure self-reported levels of empathy. The research team that developed the Jefferson Scale of Empathy states, ‘empathy is a predominantly cognitive (rather than emotional) attribute that involves an understanding (rather than feeling) of experiences, concerns and perspectives of the patients, combined with a capacity to communicate this understanding’ (Hojat, 2009, p. 413).

Results

A correlation matrix was constructed using emotional exhaustion and depersonalization as criterion variables and learning environment variables as predictor variables. Consistent with previous studies, associations were found between learning environment perceptions and burnout.

As shown in Table 1, the Academic subscale had the strongest correlation with both emotional exhaustion and depersonalization. Students’ academic self-perception indicates how students feel about their performance. This relationship can also be attributed to the internal attribution of the participants. Emotional exhaustion is described as being burnt-out from a demanding job. Feeling that their performance is solely based on their level of academic acumen could relate to higher levels of emotional exhaustion. Depersonalization is described as feeling callousness towards

Table 1. Correlation matrix from collected surveys

DREEM Perceptions	Burnout: Emotional Exhaustion	Burnout: Depersonalization
Learning	0.28	0.29
Teachers	0.33*	0.27
Academic	0.36*	0.35*
Atmosphere	0.26	0.25
Social	0.29	0.32*

* 0.3-0.5 is a significant correlation

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others. Using internal attributes for academic success such as doing well academically because of good studying techniques could explain the strong correlation with depersonalization.

The perception of the student influences their internal self-concept (Weiner, 2000). According to Rogers (1975, p.7), ‘To perceive a new aspect of oneself is the first step toward changing the concept of oneself’. The lack of a relationship between the perception of learning and burnout could demonstrate a strong internal attribution and self-image among study participants. Participants may have attributed their understanding and level of confidence with internal attributions without reflecting on feelings of burnout.

Several studies (Dyrbye et al., 2009; 2010) have examined the links between burnout, empathy and academic performance and perceptions. In this study, there was a moderate correlation between the Learning Perceptions sub-scale and empathy (Table 2). These results demonstrate the importance of the relationship between the students’ perception on the development of empathy and the learning environment. As the perception of the student influenced their control over their internal self-concept (Weiner, 2000), maintaining a supportive learning environment helped maintain their level of empathy.

In this study, an insignificant relationship was found between burnout and empathy (Table 3). In another study, results were indicative of higher burnout associations with lower empathy scores (Brazeau, Schroeder, Rovi, & Boyd, 2010). In this study, the lack of evidence for a relationship between burnout and empathy

Table 2. Correlation matrix from collected surveys

DREEM Perceptions	Empathy
Learning	0.38*
Teachers	0.22
Academic	0.23
Atmosphere	0.35*
Social	0.29

* 0.3-0.5 is a significant correlation

Table 3. Correlation matrix from collected surveys

Burnout	Empathy
Burnout: Emotional Exhaustion	0.24
Burnout: Depersonalization	0.21

* 0.3-0.5 is a significant correlation

may be indicative of the differences in how self-reported burnout is experienced by international students.

Hellsten and Prescott (2004) write about the effect the learning process has on student learning in international settings. While previous research evidence suggests that empathy declines during the clinical years (Hojat et al., 2004), data from international medical programmes do not show the same results. As well, Coulter and Abney (2009) and Deosthalee (2002) reported that visiting teachers reported less burnout than their native counterparts in Canada and India. Examining international medical programmes could produce more evidence about the cultural impact of the learning environment on teaching clinical empathy and combatting burnout.

The study failed to find a relationship between burnout and empathy as in some earlier studies but there were relationships between most of the DREEM learning environment subscales and either burnout or empathy. This leads to a conclusion that changes made on learning environment variables may reduce the stressors that lead to burnout and declines in clinical empathy found in some studies.

ISSUES, CONTROVERSIES, PROBLEMS

The Medical School Learning Environment

The learning environment in medical school needs to contain a strong clinical foundation and a structured methodology to teach effective doctor patient relationships. For instance, Larson and Yao (2005) emphasize the importance the medical school-learning environment plays in the training and development of skills like clinical empathy. Additionally, students' perception of their learning environment contributes to their academic performance (Wayne, Fortner, Kitzes, Timm & Kalishman, 2013). An assessment of teaching methods by a medical programme will have long-term benefits on problems such as student burnout. Our study provides more evidence of the relationship academic perception has on burnout.

Many medical school educational innovations are instituted to address a specific problem or gap in the curriculum but are not designed or implemented in a systematic way or with much empirical foundation. And, as Slavin and his colleagues (2014) have pointed out, efforts to address burnout often rely on additional courses or programmes designed to address the symptoms of a stressful learning environment rather than addressing the root cause which is the learning environment itself. From their perspective, rather than accepting the fact that the medical school-learning environment produces stress in students and creating programmes to address the effects of the learning environment, they chose to respond with larger scale curricular changes designed to reduce the stressful nature of learning in medical school.

From our perspective, educational innovations in the medical curriculum need to be evidenced based and should be derived from work in the learning sciences. Educators who wish to address issues with curricular and instructional change need to become aware of recent educational research, which demonstrates how learning and thinking are primarily context-oriented and involve a set of interlocking cognitive, metacognitive and affective abilities and processes. By incorporating this research, medical education can be designed with a stronger theoretical basis that can create improved learning environments and less stressful learning.

The Need to Assess the Medical Education Learning Environment

The Liaison Committee on Medical Education (LCME) emphasizes the importance of the learning environment in its accreditation standards (www.lcme.org/standard, 2014):

A medical education programme must ensure that its learning environment promotes the development of explicit and appropriate professional attributes in its medical students ...[and should] regularly evaluate the learning environment to identify positive and negative influences on the maintenance of professional standards and conduct and develop appropriate strategies to enhance the positive and mitigate the negative influences.

Hewson and Little (1998) write about the importance of creating a supportive learning environment to develop a safe place for learners to excel (Ramani and Krackov, 2012). This includes the importance of the mentoring and learning relationship established between the faculty member and the student. Research in other health care education fields has also stressed the need for a more supportive learning environment. For examples, Henderson et al., (2010) write about the benefits of a supportive learning environment for undergraduate nursing students. The study cites the importance of the educator as a learning guide and a critical factor for student achievements.

Assessing the perception of the student on their learning environment, it was found that the presence of a skilled and knowledgeable educator effectively assisted the transfer of learning. Deep learning was accomplished through effective teaching and role modeling behaviour. The relationship built between the mentor and student is instrumental in the learning process. The formal and informal support was documented as facilitating the learning process and promoting learning.

While learning can happen in every environment, the environment of the learner becomes the natural habitat for discovery. The academic learning environment is

responsible for providing practical and tactical knowledge so students can develop transferable abilities. Collins, Brown and Newman (1987) state the learning environment is responsible to provide students with problem solving strategies and 'tricks of the trade' (p.14). A learning environment must be a supportive setting for students to engage, discover, explore and develop. The ideal medical school-learning environment provides academic instruction within a supportive environment.

Humanistic medical care and teaching humanism is seen as an instrumental component of medical education (Gracey, et al., 2005). Gracey, et al. (2005) defines humanism in medicine as attitudes and actions that demonstrate interest and respect for a patient and related to issues of psychological, social and spiritual concerns. Medical students should be taught to demonstrate warmth, professionalism and to validate the concerns of patients. Learning these attributes produces warm and reassuring mannerisms and more effective practitioners (Blasi, Harkness, Ernst, Georgiou & Kleijnen, 2001). Teaching, learning and living the human dimensions of care become integral in the instructional focus of a medical school. Besides the strong foundation in basic anatomy, a medical school is responsible to teach its students through formal and informal methods about humanity, empathy and effective communication.

Besides the basic science model that is taught in medical school there is a strong perspective that the social environment of the medical school has a tremendous impact on the identity development and future skills acquisition of the medical student (Suchman et al., 2004). Medical students across the world develop the 'habitus' of practice to develop professionally (Benner and Sutphen, 2007). The habitus of empathy is developed from inner experiences, patient feedback and observations and is universal in the professional experience.

Education for the Reflective Practitioner

Benbasset (2014) has stressed the role of critical reflection in reducing student anxiety and other stress-related problems such as burnout. He has also pointed out that improving positive personal perceptions such as self-awareness and awareness of others, which have been associated with increased levels of interpersonal competence, can also lead to more anxiety if students are not provided with the tools to become critical thinkers.

Critical reflection involves a critique of the presuppositions on which our beliefs have been built which transforms learning into a new experience (Mezirow, 2003). Reflection has been defined as intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciation (Mezirow, 2003). Educational institutions have a responsibility to

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provide learning environments that foster intellectual advancement while producing reflective practices.

The importance of a medical school-learning environment has been shown to be directly related to student learning and emotional development (Gracey, et al., 2005). The learning environment must train students in self-directed learning and provide guidance so each student develops their own insights and knowledge awareness (Carr and Johnson, 2013). Murinson, et al., (2010) found that student emotional development progress from first year to graduating medical student is a mark of a successful learning environment.

In relation to burnout, Maslach (2003) has pointed out that exhaustion and cynicism tend to emerge from school overload and social conflict while a sense of inefficacy arises from a lack of resources within a situation (Maslach, 2003). In our study, the majority of learning environment domains were associated with burnout which suggests that reducing burnout requires a holistic approach that may emphasize methods to improve the academic environment (Table 1). Dyrbye, et al., (2009) researched specific learning environment characteristics and burnout and found that the influences having an effect on burnout levels are variable and differ at different places in the medical curriculum. Dyrbye, et al., (2010) demonstrated that a supportive learning environment has a significant impact on student burnout and they have suggested that a supportive learning environment is important for optimal learning, facilitates the development of professionalism, and has a profound impact on student burnout.

The research and literature on burnout in medical school education has produced a number of findings about causative factors of burnout and implications for learning. Table 4 summarizes findings from two studies (Dyrbye, et al., 2010; Muzafar, et al., 2015) that identify important learning environment factors in burnout.

Table 5 shows the elements of the learning environment that were associated with burnout and student perceptions of their clinical empathy in the study presented in this chapter.

Summarizing from a number of studies that looked at the medical school-learning environment then, it can be shown that there are two main areas that should be

Table 4. Causative factors of burnout

Causative Factors of Burnout	
(Dyrbye, et al., 2010)	(Muzafar, et al., 2015)
Workload	Too much study with little balance
Increased student autonomy	Lack of supportive relationships
Stressed relationship with others	Lack of time for recreation
Stress of patient care	Lack of belief in what you do

Table 5. Elements of learning environment associated with burnout and empathy

	Burnout Dimensions		Empathy
	Emotional Exhaustion	Depersonalization	
Teachers	X	X	
Academic	X	X	
Social		X	
Learning			X
Atmosphere			X

addressed in efforts to create curricular changes to combat stress-related problems such as burnout. One is the stress that is created through academic pressures. The other relates to pressures associated with social aspects of medical education.

Maslach’s theory of burnout states that burnout occurs when people lose a sense of positive connectedness with others and have a loss of shared values among peers (Maslach, Schaufeli, and Leiter, 2001). In medical education, Dyrbye (2010) found that strong social relationships were associated with resilience to burnout. According to McKenna, Hashimoto, Maguire and Bynum (2016) in proposing that medical education programmes need to stress the need for connection stated, ‘we should prioritize connecting with one another and with our patients to build a sense of belonging within our teams, programmes, hospitals, and profession’ (p. 1199).

SOLUTIONS AND RECOMMENDATIONS

This chapter argues that a culture shift is needed among medical school educators to change the conversation from segregated attempts to address burnout to a more theory-based, instructional approach (Eckleberry-Hunt, Van Dyke, Lick, & Tucciarone, 2009). As such, medical instruction and curriculum design should be evidence based and have a more humanistic, educational perspective focused on producing a more reflective and mindful practitioner. Instructional paradigms and pedagogies should be grounded in learning science and designed to produce reflective, integrative and professional medical students, which should go a long way to reduce stress and stress-related problems such as burnout, imposed by current medical curricula.

The Science of Learning

Understanding that the source of distress could stem from the learning environment, curriculum reform can be effective at improving student stress and wellbeing (Slavin, Schindler, & Chibnall, 2014). But medical educators who wish to address

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the need for a more supportive medical environment need to become aware of recent educational research that demonstrates how learning and thinking are primarily social activities, context-oriented and involve a set of interlocking cognitive, metacognitive and affective abilities and processes that need to be cultivated and addressed in instruction. By incorporating this research, medical education learning environments can be designed with a stronger theoretical basis about learning that can help produce practitioners who know how to assess and manage care needs, using contextualized and integrative thinking with decision making. But as this chapter will argue, education for the professions and medical education more specifically requires a new perspective and approach.

Various authors have pointed out that the unique nature of educating for practice demands an integrative pedagogy that presents knowledge, technical skills and ethical, patient-centred practices in ways that help students become reflective practitioners. Benner and Sutphen (2007) and Benner, Sutphen, Leonard, and Day (2010), for instance have called for health care education that focuses on the following:

- **Contextualization**

Teaching knowledge and skills separately or in a decontextualized manner produces fragmented educational experiences. Students should be taught in an environment where knowledge and thinking are situated and linked to action applied in a particular context. Faculty members must provide connections between the professional knowledge and the use of that knowledge in the practice setting.

- **Authentic Learning Experiences**

Teaching situations often involve impoverished settings that do not approximate the dynamic clinical setting and many assessments focus in on fine-grained or elementary competencies. Students need instruction and assessment in clinical settings encompassing a diverse set of patient care situations.

- **Multiple Ways to Think**

A singular focus on teaching scientific and critical thinking skills often results in a cynicism and a habitual critique of methods being taught. Scientific and critical thinking need to be augmented with other ways of thinking such as the ability to reason through the trajectory of a patient's developing situation and that integrate patient needs and the student's own life experience.

- Formation of professional identity

Health educators should transition from a focus on socialization and role taking to an emphasis on the formation of a professional identity, which supports reflective practice.

As a number of health educators such as Benner (1984), Noone (2007) and Berragan (2013) have pointed out, health professions require education for practice. Curricula and instruction must be designed to deliver education in a contextualised fashion that links knowledge, skills and ethical and reflective practice behaviour.

Situative Learning Theory in Medical Education

In the last two decades, many learning scientists have shifted their studies from a focus on the individual's cognitive processes and learning to a broader conception of thinking and learning as social activities. Learning scientists with this sociocultural perspective focus on the social nature of learning and thinking and many make the claim that all learning and thinking is situated in and tied to social contexts. Rather than focusing on the learning processes of individuals, learning scientists with this sociocultural perspective focus on communities of practice and investigate learners' interactions and patterns of participation in the activities of the group.

According to situated learning theory or what some (Greeno, 1997) have called the situative perspective, learning and cognition are thought to be the products of activity occurring in situations or communities of practice and knowledge, learning and thinking are distributed among the members and components of these communities rather than the strictly unique product of individuals (Greeno & van de Sande, 2007). The situative perspective looks at learning, cognition, motivation and achievement as social activities (Turner & Nolen, 2015) and applies the sociocultural view to research into classroom learning.

Greeno and van de Sonde (2007) have outlined the main issues in situated learning as it applies to education. Their main points include:

- Knowledge and cognition are distributed among individuals who interact within a social system
- Knowledge and cognition function as a capability for participating in activity systems

Seen from this perspective learning is a change in participation and positive learning is a change in the direction of more full, active participation. Using the situative approach to developing more effective and supportive medical learning

education we would want to take into account how students coordinate interactions with each other, the learning resources and the elements of the learning environment and try to determine which learning environment elements afford positive student progress and which constrain this progress

To address the relevant pedagogical concepts from situative learning in medical education one needs to design instructional environments that incorporate notions of the social nature of thinking and learning, important aspects of discourse and guidance for the development of an appropriate professional identity. The situative perspective can inform medical education by providing guidance on how to address relevant learning affordances and the abilities and intentions to find and use them. A number of researchers (Greeno, 1992; Greeno & van de Sande, 2007; Gresalfi & Cobb, 2011) have described aspects of situative learning derived from research in the learning sciences that are relevant to medical education. Three that are particularly relevant include the social nature of cognition and learning, affordances and constraints in discourse, and an activity-based concept of identity development.

Learning in Context

One of the lines of research that stimulated the idea of learning as a social activity situated in communities of practice comes from Lave (1988) and later Lave and Wenger (1991) who studied traditional apprenticeship learning and training in authentic settings. Their work established a set of principles for learning in authentic contexts that laid the theoretical groundwork for studying cognition in practice or what has been called situated cognition.

According to Lave and Wenger, the apprentice learns and carries out tasks in a real-world context e.g. a tailor shop, a classroom or an academic medical centre, where experts and novices of varying abilities are working together. This creates a learning culture where beginners have access to expert performance and guidance and engage in learning in context that shapes the apprentice's growing perception of what constitutes good practice. Rather than learning skills in isolation as is done with much of school learning, learning in a real-world setting provides more signals and reminders, or what some call affordances, about how to apply the skills that have been learned.

The Apprentice Model of Learning in Context

Apprentices start out working on small pieces of the final product with assistance from the experts and advance to more difficult tasks and products that successively approximate the final product. Because they learn in context, apprentices have access to experts who provide both modelling and coaching and offer examples of

both finished products and work-in-progress. Through observation of the experts' successful techniques (and also the errors of other apprentices) apprentices can create internal models of the final product, which they can use to guide their developing skills.

A basic tenet of Lave and Wenger's theory of situated cognition is that the interaction of observation, coaching and scaffolding provided by the expert and the increasingly skilled performance of the apprentice allows the apprentice to shape a productive mental model that can guide their progress. Contrast this with typical decontextualized schooling methods that try to build up knowledge and skills in a sequence of small pieces where the learner does not get to observe the final product for a considerable amount of time. Not only is the learner deprived of any guiding model with which to direct their developing skills in this scenario, the lack of context for their learning hampers them in the development of the self-monitoring and-correction skills that come with having continual access to expert techniques and problem-solving skills.

Finally, by developing their skills in context, apprentices develop not just a set of skills and knowledge about tasks, they also develop a practice informed by social learning principles (modelling, group-learning) into what some have called a habitus, or habits of mind that guide practitioners in that profession. Apprenticeship learning then, is learning for practice. Situated learning, the idea that learning in context produces knowledge through activity connects this perspective to apprenticeship learning and leads the way to a new pedagogy for producing reflective practitioners whose knowledge and skills are blended in a complex, network of skilled practice.

Cognitive Apprenticeship

Cognitive researchers such as Alan Collins, John Seely Brown and others extended Lave and Wegner's characterizations of apprenticeship and situated cognition and applied them to attempts to improve teaching by focusing on cognitive skills in school subjects such as math, reading and writing. Collins, et al., (1987) established a set of principles for what they called 'cognitive apprenticeship' or the application of apprentice learning to the teaching of cognitive skills in applied settings.

The term cognitive apprenticeship was used to stress two issues: First, as with traditional apprenticeships, teaching methods attempt to express explicitly expert's mental processes and strategies used in solving problems in a domain such as math or reading and domain knowledge is always taught in service of carrying out actual tasks rather than as isolated, decontextualized knowledge. Second, although cognitive apprenticeship teaching uses the same modelling, coaching and scaffolding techniques as traditional apprenticeships, the focus is cognitive and metacognitive skill development (Collins, Brown and Newman, 1987).

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In a follow-up article, Collins, Brown, and Holum (1991) using the principles of apprenticeship derived from Lave and Wenger and their own previous work, outlined a cognitive apprenticeship instructional methodology comprised of modelling, coaching, scaffolding, articulation, reflection and exploration. In their methodology, modelling, coaching and scaffolding are social learning methods that are used to help students develop the cognitive and metacognitive skills that are the target of cognitive apprenticeship.

Modelling is the technique of learning from observing expert performance, coaching is where the expert provides feedback to guide the development of expert performance and scaffolding is the technique of providing support for performance at first but then reducing that support until which time the learner can successfully perform the task without support.

The next two methods are articulation, where the instructor aims to encourage the students to express their knowledge or strategies and reflection, which is a comparison of the student's critical processes and those of the expert. Exploration, the last technique in cognitive apprentice instruction, is an attempt to move the student to independently execute expert problem solving and to seek out and define new problems that can be solved with the newly acquired skills and strategies.

The idea that learning in context produces knowledge through activity has been applied to health science education and points the way to a new instructional paradigm for producing reflective practitioners whose knowledge and skills are blended in a complex, network that results in skilled practice.

Pedagogies to Produce Reflective Practitioners

Many health care educators (Slavin, et al., 2014; Dyrbye, 2010; Benner and Sutphen, 2007) have written about the need for more effective pedagogical elements that foster effective professional health care practice. For instance, it has been suggested that teaching students to practice reflection is critical for making professional and humanistic qualities more clinically salient for students (Shrank, Reed & Jernstedt, 2004). Teaching the importance of reflection develops collaborative learning and fosters lifelong learning through habits of inquiry (Puvanendran, Vasanwala, Kamei, Hock, & Lie, 2012). One method to teach reflection within the medical learning environment is to teach the knowledge, skills and professional comportment in reflective health care practice (Stalmeijer, Dolmans, Wolfhagen, & Scherpbier, 2009) using an apprenticeship model derived from social cognitive learning theory as describe previously. This approach can, in theory, lead to a more humanistic and connected type of medical education learning environment.

The Three Professional Apprenticeships

The idea of applying apprenticeship principles to education was picked up by the Carnegie Foundation (2007) in their studies that identified the important components of professional education. Because of the need to teach both knowledge *and* skills in professions, there is a need for educational techniques that help students integrate not only knowledge and skill but also another aspect of professionalism that some equate to ethical practice, which is identity or thinking like a member of the profession. Out of this work came the notion of teaching to three high-level sets of skills and knowledge called cognitive apprenticeships. The Carnegie studies identified three dimensions, which they labelled high-end apprenticeships for professional education:

- A knowledge apprenticeship that includes teaching the academic knowledge base and habits of mind important to the profession
- A skill-based apprenticeship that relates to practice, and includes professional practice judgment
- An ethical practice apprenticeship that addresses teaching and learning of ethical standards, ethical comportment, social roles, and responsibilities of the profession.

One of the issues of concern for Muzafar, et al., (2015) was the finding that many medical students not only had worries about future competence and professional endurance but also had lost confidence in the medical profession in general. This can be seen as a failure to develop a proper professional identity and is a factor that may be related to burnout. The development of a professional identity can be addressed directly in situative learning environments with specialized pedagogies for professional development implemented in the framework of the three high-end apprenticeships.

Pedagogies of Interpretation

A more humanistic or civic form of professionalism calls for a more contextualized interpretation informed by the ability to filter science and theory through personal experiences and consider the unique nature of the elements that make up the current situation under examination (Benner & Sutphen, 2007). Students being educated for professional practice must develop a certain level of critical interpretation to be able to analyse situations and the methods they use. This type of interpretation is not bad in itself but it can cause the student to become overly critical or analytical of what is being taught and may leave them with restricted forms of action. Instead students need to be prepared to reflect critically on their profession's best practices,

theories and techniques but still maintain a solid foundation that allows them to act and practice in a self-reflective way that is grounded in the current situation.

Foster, et al., (2006) have called this type of practice ‘passionate engagement’ which refers to a type of professional practice that includes the practitioner’s ability to situate their learning and practices within their own experience and world view, a contextual awareness of the critical elements of the situation and the knowledge of best practices in their profession. The pedagogy of interpretation requires experiential learning and integrative learning experiences that combine knowledge of theories and techniques so that students will have a repertoire of experiences to bring to bear on the professional situations they face.

Pedagogies of Contextualization

Standard scientific approaches to practice taught in professional education are general and not necessarily linked to any specific situation. But research in the learning sciences points out that knowledge and cognition are situated and therefore practice must be adapted to the given context. Problem solving in practice is practical reasoning and requires that the practitioner select the elements of professional knowledge most relevant to the given context. Again there is an interactive element to reasoning in context and it requires a more self-reflective, personal demeanour than if one were viewing the situation from a decontextualized, scientific perspective that tends to objectify situations and participants.

According to Brookfield and Hess (2008) the pedagogies of contextualization help students to

- Develop a consciousness of the context
- Participate constructively in their encounters with contexts, and
- Engage in social and systemic change

Pedagogies of Formation

Faculty in professional education are used to communicating beliefs, values and attitudes held by the profession as part of helping to socialize students into a profession (Benner & Sutphen, 2007). These are components of professional identity but they are separate from another important aspect of professional identity which has been called habitus or habits of practice and are said to guide practice on a less conscious level than beliefs, values and attitudes (Bourdieu, 1990). The developing habitus comes to define the practitioner’s habits of practice and although they do not operate at a conscious level they guide the practitioner’s professional activities. The skills and actions guided by the unconscious habitus actually shapes

and frames the practitioner's professional perceptions and approaches to practice. Taken together with attitudes, values and beliefs, the skilled practice of habitus can actually enhance the professional's perception of events in practice and provide a constantly improving frame of reference.

Unlike the traditional methods of socialization, which might be communicated didactically, habitus develops through activity and as the skills of the profession are learned they create a keener professional focus and enhance abilities to make finer and finer distinctions. Therefore, habitus or habits of practice are an interactive process whereby a new identity is formed so that students begin to see themselves as members of the profession rather than just acting the part. There is a social aspect to the development of habitus because this development requires activity and activity in most professions requires interaction with other people. The teaching of identity formation can be built into instruction by providing students with opportunities to reflect on practices during problem-based or clinical learning so that we produce practitioners who continually refine his or her abilities of discernment.

Pedagogies of Performance

A strictly scientific or analytic professional perspective may lead students to believe they can practice unconnected to others in the professional situation if they are just dutifully analytical enough. Professional action is situated in the sense that the professional must interact with others in the course of the performance of his or her duties. Performance is where a professional integrates what has been gained from pedagogies of interpretation, formation and contextualization. Performance is embodied theory in practice.

Adapting the curriculum to address issues such as burnout need to address situated learning principles. This requires a design model that integrates the cognitive, skill and comportment components of apprenticeship learning and specifies the identity development elements that will be addressed in the situated learning environment.

FUTURE TRENDS

An important trend in medical education is the increasing use of instructional technology (Colbert & Chokshi, 2014; George, Dumenco, & Dollase, 2013) and medical education needs to examine the merging of instructional technology systems with the situated learning methods described in this chapter to create what Rosenheck (2013) called Cognitive Apprenticeship 2.0. Unfortunately, like so many additions to the medical curriculum, instructional technology is often implemented piecemeal resulting in a fragmented learning experience for students (Hamlin, 2015).

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As Colbert and Chokshio (2014) have stated, 'First, any innovation in technology must be integrated with innovation in pedagogy' (p. 1584).

Situated learning methods identified in this chapter address the three high-level apprenticeships that the Carnegie Foundation studies have deemed important for producing reflective practitioners. Implementation studies that merge situated learning techniques with instructional technology need to determine how to extend the range of instruction, from place-based settings to the delivery of instruction wherever students might need to learn. The more information technology driven learning activities can be linked with situative clinical learning experiences the more students can benefit from the power of situated learning principles.

CONCLUSION

Gracey, et al., (2005) stated that many physicians recall a training experience that influenced and changed their practice of medicine. The influence of one experience within the learning environment can have long lasting consequences on the development of the medical student. Learning to practice empathically and reflectively from faculty and clinicians can enable students to develop new ways to relate when presented with similar or unique situations. If the goal of medical education is to produce competent, reflective practitioners who can integrate knowledge, skills and comportment, then apprenticeship-like teaching, coaching and modelling become instrumental in the medical school-learning environment.

Slavin, Schindler, and Chibnall (2014) have demonstrated a significant reduction in burnout occurs after addressing the medical school-learning environment. Without sacrificing critical educational components, the medical programme removed unnecessary stressors in the learning environment itself while teaching students to develop skills in resilience and mindfulness. This and other studies have supported the suggestion by Drybye, et al., (2010) that aspects of the learning environment related to burnout are malleable.

This chapter proposes that an apprentice type of mentoring programme among medical students can assist with positive feelings of self-perception. In addition, social learning theory and the apprenticeship model suggests that the level of competence that people attribute to a role model will affect their attitude toward their career decisions (Savickas, 2001). A student with a strong role model relationship will be a satisfied and motivated learner (Lockwood, Jordan & Ziva, 2002). A student's perception of their relationship with their role model is strongly associated with their motivation level and achievement (Maulana, Opdenakker, Den Brok, and Bosker, 2012). Previously, research has shown that there is a strong correlation between the belief of one's abilities and the amount of motivation and performance

(Redmond, 2014). This is important since a positive perception affects motivation and the disposition for self-learning (Wallsten, Pleskac, & Lejuez, 2005). A strong mentoring relationship can be used to reduce burnout among medical students.

Using the cognitive apprenticeship model to create learning experiences that integrate observation, guided-experience, reflection and independent practice (Collins, Brown & Newman, 1987) provides for the development of a professional identity and allows students to think like a physician. The ability of an educational institution to integrate observational learning, apprenticeship-like experiences, cognitive skills training and student reflection is instrumental in influencing the professional competencies that form the reflective practitioner. Viewed within the cognitive apprenticeship framework, the relationship built between learner and faculty shape the future of the practitioner.

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KEY TERMS AND DEFINITIONS

Apprenticeship Learning: Traditional method of training people into a profession that has powerful features for learning. Researchers such as Jean Lave, Allan Collins and John Seely Brown have identified effective learning and teaching techniques from apprenticeship learning and applied them to classroom learning.

Burnout: A psychological syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment.

Clinical Empathy: A predominantly cognitive (rather than emotional) attribute that involves an understanding (rather than feeling) of experiences, concerns and perspectives of the patients, combined with a capacity to communicate this understanding.

Cognitive Apprenticeship: Extension of apprenticeship training techniques to the teaching of cognitive and metacognitive skills.

Contextualization: Practical reasoning and requires that the practitioner select the elements of professional knowledge most relevant to the given context.

Formation: A pedagogy that produces habits of mind or what some have labelled habits which is the ability to think in context and perform like a member of the profession.

Situative Learning: The perspective that learning and cognition are distributed over activity systems and communities of practice and looks at learning, cognition, motivation and achievement as social activities and applies the sociocultural view to research in classroom learning.

Social Cognitive Learning Theory: The learning theory that learning is a social activity and that people learn from one another, via observation, imitation, and modelling.