

Preparing medical students as agentic learners through enhancing student engagement in clinical education

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Preparing medical students to be agentic learners is held to be increasingly important. This is because beyond sequencing, enhancing and varying of experiences across university and health care settings, medical students require epistemological agency to optimize their learning. The positioning of students in these settings, and their engagement with these is central to effective medical education. Consequently, when considering both the processes and outcomes of individuals' learning to become a doctor, it is helpful to account for the interrelated pedagogical factors of affordance, guidance, and engagement. This paper focuses on the last set of concerns - the student's *engagement* - with particular consideration to how they shape the relations between what experiences are afforded through the medical program and how they elect to engage with them. Evidence from a qualitative study is used to present five salient factors that are central to assist medical students prepare as agentic learners. (*Asia-Pacific Journal of Cooperative Education*, 2013, 14(4), 251-263)

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Educational experiences are only as effective as students' engagement with them; because it is students who elect how effortfully to engage in the learning process and, consequentially, learn. So, beyond what experiences are provided for students by educational institutions (i.e. the enacted curriculum), is how students engage and learn through them (i.e. the experienced curriculum). These provisions include the close personal interactions that students can access (e.g. teacher – student), and the activities made available to assist their learning. Some experiences and interactions will be highly invitational and support individuals' learning whilst, conversely, some might inhibit efforts to learn. For example, in healthcare settings, the close support and guidance of preceptors who want to assist individuals learn and provide authentic opportunities, exercise patience and otherwise support learning are strong and productive affordances. Conversely, when students find themselves being denied access to activities and interactions that are necessary for their learning, productivity will be inhibited. Beyond the quality of these experiences and the degree by which they afford learning, is how students engage with them. This engagement is salient because students learn through active processes of construal and construction of what they experience. Moreover, the intentionality (i.e. personal purpose), effort and direction of their engagement processes are central to their learning. Therefore, students' readiness to take up and engage with the invitations being offered to them is central to their learning.

Medical education programs tend to focus on affordances, comprising institutional arrangements (e.g. clinical rotations), deliberate activities to assist their learning (e.g. tutorials, lectures, practicum sessions, access to experts), and ordered processes of affordance and learning (i.e. program structure). However, without considering students' engagement, these provisions alone may be insufficient for effective learning. They have to engage with resources providing access to this knowledge, and negotiate around factors inhibiting the process of accessing it. Students' personal epistemologies, including

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their capacities (i.e. their existing knowledge) and kinds of epistemological strategies they exercise (i.e. their ways of knowing), are central to their learning when engaging in activities and interactions pertinent to medical education.

No amount of learner agency can compensate for the denial of access to activities and interactions required to learn what is required for a medical degree (affordance and guidance). Yet, conversely, the most seemingly inviting medical course may not be engaged as intended unless students elect to do so. This paper identifies and discusses five salient factors that are central to effective engagement in clinical education which enhance medical students' agency.

METHODS

An exploratory qualitative research approach was used to capture medical students' perceptions and bases for their engagement in their medical studies. Individual interviews were selected to gather valid and reliable data to understand students' motivations, actions and strategies. The interviews secured accounts of what motivated them to engage in medical education, and to describe their experiences in their program of study. Focused interviews with specified, yet open items were adopted. Ethical approval was secured from the Flinders University Research Ethics Committee.

Medical students from a four year graduate entry program comprised the study population. Students select one of three models of clinical education for their third year (i.e. first clinical year): i) the traditional hospital based block model (TBM), ii) the rural longitudinal integrated curriculum model (LIC) or iii) a hybrid model of these two models. The TBM consists of five 8 week rotations through the specialties of medicine, surgery, psychiatry, women's health and pediatrics in an urban tertiary hospital. The LIC consists of 40 weeks based with a general practice and a local rural hospital, whereby they are exposed to all the specialties integrated throughout the whole year. In 2010, approximately 75 students undertook their third year placement in the traditional block model. All of them were invited to participate in monthly case-based discussion groups as an extracurricular activity. Twelve students participated in this intervention. Subsequently, they were invited to participate in a semi-structured interview at the end of the year, of which eight consented. The interview questions addressed participants' perceptions and experiences of learning in clinical environments, and through the case-based discussion groups. Further, as the LIC model has demonstrably been a successful model to optimize continuity and integration across the clinical year, LIC students were also invited to participate in these interviews. Inclusion of these students provided distinct accounts of learning experiences different from those participants in the TBM, where there is recognition of a lack of integration across discipline- based block rotations. Twelve medical students in two rural LIC sites were invited to participate in these interviews, with five consenting. The only difference in these interviews was that the LIC students were not asked anything about the case-based sessions.

Thirteen interviews were conducted and recorded, each lasting between 50-75 minutes. The recordings were transcribed, pseudonyms inserted and analyzed thematically using NVivo 9 software program. One researcher (JR) performed the open coding of the transcripts and development of emerging themes, with the other researchers (LS & SB) subsequently validating the coding and interpretation of the data to assist with reliability in the analysis.

FINDINGS

The thematic analysis identified five factors describing how students' learnt to engage effectively in their medical studies. These factors comprise students' capacities for: i) understanding how to use and extend their personal epistemology; ii) maximizing opportunities in self-directed learning environments; iii) developing a positive sense of self. iv) employing assertive communication; and v) resilience through peer collaboration. These factors are interdependent and suggest that students need to become learners with agentic personal epistemologies that permit them to successfully negotiate, engage and learn from what they are afforded, for both personal and professional outcomes. Figure 1 depicts these five factors and demonstrates the interdependent nature of the salient factors for effective agentic learning.



FIGURE 1. The Interdependent Agentic Capacities of the students where numbers represent the illustrative quotes presented in this paper².

Understanding How to Use and Extend Their Personal Epistemology

Personal epistemologies comprise individuals' beliefs about what knowledge is and how their knowing is justified (Schommer-Aikens & Easter, 2006), and shape their actions (Billett, 2002). The meaning students make of their experiences influences how they learn, and subsequently shape the outcomes and understandings of their practice. The data reveal that the transition from experiences wholly with the educational institution (years 1 & 2) to

² Each quote is identified with learning model code (TBM or LIC), participant number and a unique quote number, the later is shown in Figure 1.

clinical experiences (year 3) prompted students' awareness of their epistemological approaches and consideration of how they might improve their learning. One student described developing an awareness of variations in personal learning styles and recognized that individual pace of learning differs. They concluded that it is wise to develop an approach to learning that serves them best:

... in third year especially, you realize how huge the whole discipline is and how each person learns at their own pace and you can't expect yourself to be at [the same] level with someone else even if they have a similar background, because they learn differently and just recognizing that and being okay with. I can only do what I can do. TBM_7*1

There was a reported realization of the role of personal epistemologies as students encountered new and diverse experiences. The student below describes struggling to integrate what has been learnt in university-based experiences with newly acquired clinical capabilities as they expand their clinical reasoning skills.

I was still trying to learn from text books, where you'd look up a disease and read up. If you came in and said here's an asthmatic patient, what do you do? I would be able to know what to do. Whereas if you came in with a kid wheezing, I wouldn't be able to recognize that it was asthma ... you realize that I need to make the connection between the actual knowledge and the presentation. I think we've been exposed to that throughout, but for you to actually realize that that's the case is really up to the individual. I just study with cases notes now. TBM_6²

Students reported beginning to develop capacities for clinical reasoning through encounters in clinical settings where they were presented with undiagnosed conditions. Their engagement with these experiences enabled them to make connections between presentation and diagnoses, and to understand their role in determining how best to manage patients' medical conditions.

Those were really good [stroke clinics], because it's undiagnosed, so you get to see acutely what you need to do. Once you make a diagnosis you need to know what your next step is. That totally changed my way of learning, because I needed to know exactly what's the most important thing that I need to do. TBM_6³

The clinical experiences also afforded opportunities for students to conclude that knowledge, particularly in medicine, is complex and consists of many interrelated concepts and associations. Students described justifying their knowing through observation, assessment of expert opinion, and comparing these accounts with personal experience and instinctual understandings. Students' understanding of knowing was also reported as changing with the realization that knowledge is not irrefutable facts, but rather uncertain and shifting concepts. This realization was frustrating to those expecting medicine to be a 'black and white' discipline. "I just didn't really agree with a lot of the way he [GP supervisor] dealt with certain psych issues or contraceptive issues ..., I just dealt with it as best as I could I guess". TBM_7⁴

Preceptors modeling appropriate professional and personal practices can support and guide students when making informed and productive choices in practice. Clinical preceptors use their own teaching style and students learn through observation of these preceptors' behaviors. This role modeling is often unintentional and implicit, with students analyzing different behaviors and concluding which, if any, they wish to emulate. Here, a student reflects on the uncertainty that comprises medical practice, and the impact

of poor decision- making and role of the supervisory relationship:

It's important to realize that making mistakes is part of the learning process. If we expect to be perfect all the time we're flawed in ourselves. ...that's been really good and I have made mistakes this year, definitely. Certain things that in hindsight (you think) there's no way I'd do that. But a) to make a mistake and b) to acknowledge it to yourself, and to have the confidence to say to your supervisor, hey, I stuffed up and to know that they're going to deal with it appropriately, that's really important. I think if I didn't have a good relationship with my supervisors the temptation would definitely be to cover up the mistakes I've made. LIC_1⁵

So, personal epistemologies extend beyond beliefs, and include how individuals engage in intentional learning activities. The growth of productive personal epistemologies is therefore central to, and can arise through, clinical experiences. This growth is more likely to occur if students are supported in their learning by their supervisors/preceptors.

Maximizing Opportunities in the Self-Directed Learning Environment

Graduate entry medical students are adults and expected to be self-directed lifelong learners. However, self-directed learning may not be compatible with their existing approaches to learning as it demands self-assurance and intentionality. Students may need to develop capacities to direct their own learning, particularly in clinical environments. This task may be challenging for those who are reluctant to seek guidance from others. Hence, demands to do so may result in students feeling pressed to change how they interact with others and the learning environment, as they seek to take responsibility for their own education. Indeed, some students struggle with the apparent lack of structure in the environments in which they work and learn, and the variability of opportunities and guidance in their placement. This perceived lack of direction was attested by this student:

... I didn't know what I was supposed to get out of it so I was constantly asking, so what am I supposed to learn? It was only when the registrar told me, okay, this is what you need to learn, you're fine at this, you're fine at that, then I went okay, I'm satisfied now. So it took the whole term to really get that, but I would have been a lot less stressed out if I knew what to do. TBM_8⁶

Others reported coping well with the ill-defined experiences, yet needed the structure in timetabling and location of clinical experiences. This led to some students renegotiating their clinical learning opportunities. "You have to go the clinic and say, is it all right if I sit in? Sometimes it is and sometimes it isn't. Sometimes another student beats you to the clinic that you want to go to." TBM_9⁷

Students reported addressing challenges associated with organizing and maximizing learning opportunities in clinical environments. In the TBM setting, students had to compete with peers, with junior doctors in training (e.g. interns) and students from other health professions (e.g. midwifery students) to secure productive learning experiences. One student reported how they learnt to maximize learning:

I was getting frustrated, there were three of us assigned to this rotation and three students was too many with an additional large team of medical professionals ... So I did come in out of hours. I came in on a couple of weekends and just followed around with the RMO. I found that teaching really a lot better. And the other thing that was also useful was coming back at 5pm for ward rounds, because that's when things would tend to happen. TBM_2⁸

Students claimed to be pressed to be proactive in accessing patients and in securing ‘one on one’ mentoring from clinicians on the wards. They discovered that working in the emergency department (ED) or wards after hours and forming relationships with doctors who enjoyed teaching afforded them authentic learning opportunities that would otherwise not occur. Importantly, engaging in these intense and diverse clinical experiences provided opportunities to access patients with undifferentiated diagnoses and to develop clinical reasoning skills:

You’d go and see the patient in ED and you’d be the first to see them or the second person to see them. It gives you responsibility to make decisions based with your own knowledge – so using your knowledge. TBM_8⁹

In the LIC setting competition for clinical exposure was not as intense as in the TBM. However, rural medicine clinical experiences were predominantly about common or chronic conditions. Rural students, therefore, sought out more unusual and acute conditions by negotiating time at the local hospital, assisting with retrievals to city hospitals and shadowing the duty doctor. Not surprisingly, forming relationships with health professionals within medicine and across the allied health disciplines who afforded students more varied clinical experiences was important:

Sometimes if I wasn’t scheduled and I knew there was like - the midwives do a clinic and they’re always happy for me to sit in so I tag along ... We had to do Allied Health sessions so I’d organize to go to the physios or the podiatrists or things like that. Or just hang out with the nurses or if I knew the doctor who was on call at the clinic I’d just say if you’re going to the hospital, make sure you take me. LIC_2¹⁰

Therefore, a key quality for these students across both kinds of clinical experiences is developing the capacity to be self-directed in their engagements for learning. This capacity correlates with students’ understanding and awareness of the learning process encompassing their personal epistemology (Boden, 2005), and having a positive sense of self.

Developing a Positive Sense of Self

Associated with factors above is the salience of students’ sense of self (or the self-concept); which comprises their continual self-assessment of traits, competencies and values using past experience as referents (Bong & Skaalvik, 2003). Individuals’ sense of self is likely to change over time as these reassessments occur. Marsh et al (2000) report that academically successful students entering a new high ability learning environment, such as medical school, often experience a decline in self-concept. Therefore, a robust sense of self is relevant for academic success and avoiding emotional exhaustion (Jackman, Wilson, Seaton, & Craven, 2011; Jennings, 2009). Here, a medical student reports the challenge of building and maintaining a positive sense of self as they engaged and learnt in a hierarchical environment, alongside peers who are able and highly competitive.

I hadn’t comprehended how competitive it would be against each student. Even though we get non-graded passes and there’s a whole plethora of things they try to do to encourage cooperation, the truth is people are petty... - I think it’s the nature of the job, the people who get in are quite competitive and their sense of self-worth comes out of beating others. LIC_1¹¹

Some students reported feeling inconsequential, and sometimes unsupported in clinical environments, particularly through comparing themselves to their peers. However, this focus on self-assessment through peer comparison inhibited sourcing potentially valuable

independent, feedback from educators. "I think we were too reliant on comparing ourselves to each other and not getting enough feedback early on about where we were really at." LIC_1¹²

Positive or constructive feedback can reinforce beliefs about abilities, while negative feedback may foster self-doubt and anxiety in students who do not have a strong sense of self. As one student reported "On surgery I definitely got the impression that they thought we were a bit dull or dim – I don't do well when I feel like I'm being judged." TBM_8¹³

Students struggling with self-esteem (a measure of the sense of self) developed strategies like avoidance, to steer clear of peers or clinicians who made them feel inferior or inadequate.

Just try to not allow negative aspects of certain people in the class to affect me. So when it comes down to it, especially now it's third year - so those two exams, you really need to surround yourself with people who will help you study; not people who will make you feel like you don't know anything. TBM_8¹⁴

Individuals with a positive or robust sense of self are secure enough to defend their values or modify them in light of experience. Values are principles guiding decisions and actions. Understanding differences in values is important for effective communication, decision-making and conflict-resolution, as this student suggests:

... knowing what your own values are, being able to reflect on those and the values of the people that you're dealing with. Then ... if you've got to discuss something with someone or break bad news, that you're doing it in a context that they will relate to because you've reflected on what their values and their way of viewing things. LIC_4¹⁵

Students reported learning best in a supportive environment which fosters a positive sense of self. A student with high self-esteem is confident to negotiate learning experiences, reflect on constructive criticism and approach their learning in a productive manner. Encouraging students to identify their personal values, and reflect on how they contrast with the values of others, can help prepare them for effective engagement. Students with a robust sense of self are more likely to employ assertive communication in the educational environment.

Employing Assertiveness

Employing assertive communication enables individuals to express their opinion while respecting those of others and thereby minimize conflict, have their learning needs better met and improve relationships (Espeland, 2006). Assertiveness is closely linked to an individuals' self-esteem and is something that many people struggle to attain (Lin et al., 2004). Students' reported struggling to communicate their learning needs in unfamiliar and competitive clinical environments, whilst seeking to actively engage in clinical experiences. They remarked that the inability to assert oneself through communication limited their contributions as a member of the clinical team and when requesting or clarifying feedback:

This has been a huge thing this year - learning to ... stand up and say, sorry I don't understand that. Half the time when you say that, half the group goes, yeah, I don't either.... If we stopped trying to save face, we'd actually all learn a lot better together. That's been a big thing and learning to do that in front of consultants who can be very intimidating, not being worried about what they think in the end and saying, look, I'm sorry, I don't understand your explanation of whatever you're trying to teach. LIC_1¹⁶

One student described 'finding her voice' a major challenge to learning clinical medicine, and her confidence to speak up depended on team support:

Having a voice I guess... depending on the consultant and the team, actually being a part of a team, instead of standing in the back and taking a more passive role, which is difficult at first, because you don't feel confident and it's very easy to stand back and go, okay, it's all happening in front of me. It's challenging every time you go on a new team to find your place –sort of judge people's reactions on whether or not to speak up or stay quiet. TBM_9¹⁷

Engaging effectively in learning through independent physical examination and history taking on the wards was also inhibited by student apprehension about direct interaction with patients.

..in hindsight, it's probably better for your confidence and your clinical experience if you had just gone and taken a history from a patient, done an examination; just go and sit and talk to a patient. Because the first time I went and talked to a patient - I had come from engineering, I was shit scared, I was shaking and I was like: "What's going on here?" It was this 80 year old guy, just sitting down and speaking to a patient was a bit scary; after the first couple of times you're kind of like, it's no big deal, just going and having a bit of a chat. TBM_2¹⁸

The students described ineffective communication in the self-directed environment inhibited their ability to ascertain learning goals and negotiate learning opportunities. However as they became more confident and shared negative experiences they began to seek clearer guidance to improve their engagement in the learning process.

So I took that on board from what other students had said, especially if I knew I was going to the same team that they had just come from and just asked either the Senior Registrar or the consultant what is my role here? What do you see is mine because I would like to get involved, rather than stand back and hold notes? TBM_8¹⁹

Students reported that as the year progressed, through developing relationships and employing assertive communication, they became more comfortable in the clinical environment and more confident and willing to engage fully in their learning. Moreover, developing these interaction skills were as highly valued as technical knowledge:

The clinicians that we're working with don't ... won't know the best way that we'd learn or what is expected of us. So we need to be able to inform them in the right way. I don't know whether it's telling students how to be more pushy in a good way. But, the preparation for ... how to interact rather than preparation in terms of knowledge or clinical skills. TBM_5²⁰

Educational programs need to provide students with both knowledge and skills to engage effectively in self-directed learning activities, which in turn require them to confidently and assertively approach their work and learning. Yet, developing such skills took time and demanded resilience.

Resilience Through Peer Collaboration

The students reported being stressed and overwhelmed by the demands of the curriculum, which led to anxiety, fatigue, and lack of motivation; what some term 'burn out'. The main contributors were identified as being threefold. Firstly, medical curriculum workload, including time management, self-regulation of learning, peer competitiveness, difficulty with integration of theoretical learning and clinical experience. Secondly,

transition to clinical learning environments including the burden of patient responsibility, supervisor interaction, confronting undesired medical outcomes, such as death and unethical behaviors. Thirdly, personal factors such as loneliness, isolation and family issues. Students here reported using a range of strategies for coping with the demands of clinical education experiences. They described an evolving process of resilience where individuals interact with their environment, develop strategies, and establish support networks that promote mental and physical wellbeing: "... those are the things that really take the toll. Knowledge will come and eventually the clinical skills will come, but it's all the mental stuff that you take home with you..." LIC_1^{*21}

All participants reported the importance of close peers in providing emotional support and motivation to pursue their medical studies. Students collaborated in forming study groups, some commencing in the first year by students with similar learning styles and dispositions, which continued across 3 years of study, despite separation by distance. Peers were individuals who understood the difficulties of studying medicine and acted as confidants for each other, as one student explained:

Within our group we're pretty comfortable with everyone, so we're quite happy to say: you know I did this stupid thing today and got absolutely drilled by the consultant, whereas some other people might be like, I don't want to share that I've made a mistake because they might look down on me. TBM_2^{*22}

Students with a better grasp of particular concepts were sought to act as tutors for those who were struggling to comprehend them. The student below recalls:

Well, my weaknesses [if]... I'm struggling understanding a specific aspect and the students I'm learning with are going really well in that, it feels like I'm a bit behind the eight ball, I'll sit down with someone and chat to them about it, and they know what it's like to be a medical student, what it's like to be in my situation, they're keen to see me grow and learn and we work through it. LIC_1^{*23}

Positive relationships with preceptors/supervisors were also important for helping students negotiate the complexities of clinical learning environments. Students reported discussing their personal concerns, identifying learning opportunities and being both mentored and motivated by their supervisors.

I walked up to my supervisor, I was crying, and I said, I can't do this. This is beyond me. So he sat me down, chatted to me for a good hour or so, stopped whatever work he was doing at the time, talked to me about how he felt as a student, going through the same process. I assumed I was not capable and he had a lot of faith in me. So then he contacted the people up here, they made a few changes to my timetable to give me a bit more of a break, organized for me to see one of the local psychologists here at the clinic. So I saw them about six times, I was pretty cynical about that to begin with, but it ended up being really practical information. LIC_1^{*24}

Students described developing resilience over time. They describe the importance of taking it one day at a time; learning about and understanding the clinical learning process; understanding their individual needs as learners and developing ways to cope:

I think it's really just a matter of going through the year, like you've just got to take things as they come. You know just learn little bits and pieces here and there and sink or swim kind of thing. LIC_2^{*25}

The student below identified positively that difficulties they faced were useful learning

experiences in their journey to become a doctor:

I was glad to go through it because I figure the same pressures are going to be on us when we're interns and I'd rather have the skills to cope with it now and get through the same thing again in a couple of years' time. LIC_1²⁶

Resilience is an individual approach involving behaviors, thoughts and actions to develop strategies to succeed, dependent on individuals' disposition and experience. Studies indicate that the most important factor in resilience is having supportive relationships offering encouragement and reassurance (Rutter, 1993; Werner, 1989) as demonstrated by these medical students.

Several other factors are reported to contribute to developing resilience: a positive view of self [positive self-concept]; skills in communication and problem solving [assertive communication], the capacity to make realistic plans and take steps to carry them out [self-directed learning], and capacities to manage strong feelings and impulses (McAllister, Madsen, Godden, Greenhill, & Reed, 2010). The students here reported struggling with their sense of self, employing assertive communication, engaging in learning opportunities and coping with stresses in their personal and work life.

As outlined above this study has identified five salient factors that interdependently contribute to developing medical students' agency and ability to thrive in self-directed learning environments.

DISCUSSION

The medical program incorporates a problem based learning approach from Year 1, requiring students to actively engage in the learning process and promote the premise that knowledge is more deeply learnt when it is self-regulated (Entwistle, 2000). Third year medical students are required to be highly self-directed and motivated in their learning, to be well prepared for final exams. The findings here suggest that successful agentic students developed a sense of awareness of their epistemological beliefs to set appropriate learning goals and guide their learning process. These students were able to develop self-directed learning strategies which eased the integration of new knowledge with their existing knowledge through reflection on, and justification of that knowledge. This was achieved when they perceived a positive self-concept, maximized learning opportunities, employed assertive communication and possessed coping strategies.

Schommer (1994) demonstrated that epistemological beliefs affect learner's understanding, study strategy and reasoning skills. Boden (2005) reported that personal epistemologies extend beyond beliefs, and include how individuals go about engaging in intentional activities, such as learning. Students in this study confirmed the need to engage with resources that provided access to knowledge, and negotiate around those who make the process of accessing knowledge difficult. Understanding one's own learning preference may, therefore, enable more effective and efficient use of time, resources, interactions, and enhance the ability to adapt accordingly (Schommer-Aikens & Easter, 2006).

The findings also demonstrate that these students experience the realization that knowledge is complex and uncertain, thereby demanding they make judgments on how best to apply their knowledge in the clinical context. Developing the capacity and skill to integrate knowledge enabled students to progress from feeling overwhelmed by the need to retain numerous discrete, discipline specific facts, to feeling confident of their ability to access that

knowledge through the process of clinical reasoning (Knight & Mattick, 2006). However, clinical reasoning is an attribute that takes time to develop (Kegan, 1994). A curriculum that promotes students' conscious consideration of their learning style, reflection on their learning experiences and integration of new information may improve academic outcomes (Schommer-Aikens & Easter, 2006) and promote clinical reasoning capacities.

A positive self-concept is identified as important for successful self-directed learning (Pérez, Costa, & Corbí, 2012). Students shape their academic self-concept in part on the appraisal of their peers and supervisors. Academically confident students may judge themselves less capable than highly able peers (Jackman et al., 2011). Students here described not coping well with critical or inconsistent feedback, and some decided to avoid feedback all together. We found that students were comparing their clinical competence and knowledge level to their peers resulting in feelings of inadequacy and constituted a disadvantageous learning strategy. Some medical schools are attempting to address the issue of peer competitiveness in clinical environments by introducing a standards-based assessment system, however research has demonstrated that levels of peer competitiveness remain unchanged (Wilkinson, Wells, & Bushnell, 2007).

Assertive communication may help students to feel more in control of their learning environments, by being able to confidently seek clarification, avoiding conflicts, determining supervisor expectations and managing time. These actions may reduce anxiety and frustration, and improve their sense of self (Gordon et al., 2000; Lin et al., 2004). Assertive communication is assumed to be developed through their problem based learning groups in years 1 & 2 (Wood, 2003), yet as this study indicates students were at times intimidated by the clinical learning environment. Therefore, clinicians may help students feel a respected part of the team by encouraging them to ask questions or comment on clinical cases with the intention this will build assertiveness (Gordon, 2006). These issues point to faculty development in all teaching sites, as well as enhanced preparation for the clinical years.

The literature consistently reports that studying medicine is an intensely stressful experience with approximately 25% of medical students experiencing depression (Dyrbye et al., 2006) and approximately 50% of medical students display symptoms of burnout (Dahlin & Runeson, 2007). The students in this study reported experiencing stress and using coping mechanisms. They described the process of developing resilience during the academic year through the support of their peers with whom they collaborate. Peer group interactions are acknowledged as playing an important support role for medical students and mutual understanding facilitates the development of coping strategies (Chou et al., 2011; Satterfield & Becerra, 2010). Their ability to do this is dependent on their assertive communication and a positive sense of self.

Medical students require effective preparation for the challenges of professional practice and the clinical training experience (Moffat, McConnachie, Ross, & Morrison, 2004). This study demonstrated the interdependence of five factors and how fostering all of them within clinical environments may enhance students' academic success and personal wellbeing. A limitation of this study was the low number of participants, however, the interviewing was in depth and thematic analysis reached saturation. A further limitation is the research was only conducted at a single Australian medical school although students from both an urban and a rural setting were included. Whilst data was collected from medical students

only, we posit that the interdependent agentic capacities would be relevant to students of all health professions.

CONCLUSION

The intentionality, effort, direction and willingness of medical students' engagement processes are central to their learning. The ability to successfully engage in the workplace maybe enhanced by adopting the five identified factors that support learner agency. Successful agentic learners are those whom engage best with affordances provided within a self-regulated learning environment. It is, therefore, vital to determine the best way to nurture and sustain self-directed student learning. Agentic learning is fostered through the supportive guidance of clinical educators who encourage students to seek feedback and learn from their mistakes. Resilience in the face of learning challenges is likewise fostered through peer collaboration that is mutually supportive. Medical schools need to consider equipping their students with the necessary skills to engage effectively in their clinical learning which will not only enhance academic success, but also graduate junior doctors who are confident, self-assured, forthright and resilient when facing future responsibility for patient centered care. Whilst many medical programs provide a preparation for clinical practice program, these are often procedural skill based, and our findings show students would benefit from the inclusion of the interdependent agentic capacities to enhance their learning experiences.

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