

Personal Journeys to PBL: Retrospect from Unit-2 Medical Students at McMaster University

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This is the fifth of a series of papers jointly written by a tutor and his Unit-1 and Unit-2 medical students from different tutorial groups in a genuine PBL educational program at McMaster University. The first two papers deal with students' views on the philosophy and process of problem-based learning (PBL) as they experienced during the first year^[1,2]. The third paper is concerned with students' views on the early clinical exposure in the PBL curriculum^[3] and the fourth article describes the sources of stress in their learning under the intense self-directed PBL environment^[4]. In this communication, all six students in Dr. Kwan's tutorial group recapitulated, in their own words, the thoughts and preparative events that have led them to follow the roadmap to PBL at McMaster Health Sciences Center. What made them chose PBL and what made them choose McMaster? At the time of writing, these students had gone through Unit-1 (12 weeks) and 8 weeks into Unit-2 (16 weeks); that is, they had been given an initial taste of PBL under McMaster philosophy. Did the PBL experience at McMaster meet their expectation? We also had a visitor, Dr. Song, joining us as an observer. Dr. Song is a faculty from a dental school in China, who is on an academic mission to acquire the first-hand PBL experience at McMaster and to introduce it in dental education in his home institute in China, which at present remains as an immense infertile land for PBL in higher education. We also invite Dr. Song's input based on his observations of this tutorial group.

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Although PBL is still considered nowadays by many as an innovative pedagogic concept, it has now reached its thirty-fifth anniversary at the Faculty of Health Sciences of McMaster University, which pioneered PBL in medical education. While PBL has gained broadening acceptance over time

for its conceptual merits and advantages, its practice and effective application has constantly been hamper by the guarding skepticism based on some traditional values about education which are becoming obsolete and inconsonant with the new and progressive technological and social economical development.

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More often as a compromising add-on strategy than a thought-through revolutionary reform, PBL is continued to be introduced as a teaching methodology in a course or a module, in parallel with other traditional teaching methods. To many, PBL is viewed merely as a teaching method, with which students learn from clinically relevant cases, preferably in a small group setting; other than that, the rest of the program activities still remain as part of the traditional curriculum, including performance assessment and admission criteria. In medical schools with limited faculty development activities, it is not uncommon to observe the learning objectives derived from the case problems being heavily dictated by teachers (as opposed to learner-derived objectives), and the learning process being teacher-centered (as opposed to learner-based) or being inundated with student presentations or mini lectures from the "expert" tutors (as opposed to student-initiated interactive discussions). These issues have recently been discussed within the context of the role of PBL tutors and tutorials [5,6].

Michael Lapner entered medical school at twenty-two years of age, influenced in large part by a family tradition of practicing medicine. He describes the early influences on his career choice and the steps he took to ensure he would be the right kind of student to confront the challenges of being a medical student at McMaster:

I have been exposed to the medical profession from a very young age: my father is a pediatrician, my mother a general practitioner, my brother an orthopedic surgeon, and my sister a dentist. Growing up in a family with roots planted in healthcare, I developed an early appreciation for the necessity of helping others and the impact that doing so would have on society.

As soon as I knew that medicine was my career of choice, my challenge was to prepare myself for medical school intellectually, socially, and emotionally. After completing high school, I chose an undergraduate program at the University of Ottawa, my hometown, to study Biochemistry.

I felt this academic program would provide me with exposure to the different facets of basic science required for medical school. The Biochemistry program was taught in a traditional manner, heavily based on lectures and laboratories.

Although I acquired a wealth of information through this program, I felt that I lacked research skills. Consequently, in the final year of my undergraduate program, I elected to perform research at a chemistry lab and later at a virology lab.

During this time, I acquired essential skills needed to search, understand, integrate and apply my knowledge to a practical situation - skills that have facilitated my learning at McMaster.

However, I realized that I would need more than a strong academic background to enter medical school; I would also need strong people-skills. As the youngest of five children and also a twin, I learned the art of negotiating with people from a very early age. My people skills were further enhanced through my experience on various sports teams and my summer experiences working at a summer camp where I worked as a pupil, counselor and program and waterfront director. At camp I learned the value of teamwork to accomplish a common goal. My summers at camp added to my comfort level working with others and refined my skills as a listener, teacher, and leader.

Finally, aware that medicine is as much an art as it is a science; I felt I needed to shape myself artistically and emotionally. To this end, I undertook arts classes in high school and learned how to play the piano and guitar. These abilities developed in me an emotional depth that would allow me to

better understand and communicate with patients.

After completing my bachelor's degree in biochemistry, I researched the different medical schools to see what made each university unique.

Most medical programs appeared heavily lecture based, similar to the format of my biochemistry degree, and this didn't appeal to me. In my undergraduate years, I had discovered that I learned best by explaining things to my peers. Because of this, McMaster's small group, problem-based approach immediately stood out and coincided with my own learning methods.

After being accepted to McMaster, I knew that I would have to make some major adjustments to learn in this new, more efficient and effective manner. The first twelve weeks of the program (Unit 1) were a time to test out new ways of learning. I experimented using different textbooks, journals, and even visited experienced clinicians in order to understand objectives set during our tutorials. I discovered that problem-solving was a fun way of learning and that teaching new concepts to my peers would challenge my understanding of the biological, population and psychosocial perspectives to which we were exposed during Unit 1.

My Unit 1 group consisted of students with widely different backgrounds: a nurse, a bio-physicist, a psychology student, an arts-and-science student, and another biochemistry student. After the first few tutorial sessions, I quickly became humbled. At times, I became cognizant that, when asked by my peers to explain certain concepts, I did not always have a full understanding of what I had researched. This seemed to be a feeling experienced by other members of the group as well. As part of an effort to increase our comfort level in tutorial our group made it a priority to get to know one another at a personal level and we consequently organized various social events to

become better acquainted with one another. Once this was established, the stage was set for a cohesive team approach to solve our clinical problems.

In Unit 2, a challenge came in an unexpected format: I was the only male student in a tutorial group of five women. However, in the end it was not the gender composition of the group that provided the challenge, but the style of learning of the group. As a visual learner myself, I sometimes felt lost in group discussions. I adapted to this situation by asking my peers to draw diagrams, or explain mechanisms on a chalkboard. Furthermore, our tutor was aware of the different personalities in the group and consistently inquired about the effectiveness of each session to ensure that everyone was able to absorb a maximal amount of information. He also provided a comfortable learning environment such that the challenge to think outside our preformed objectives and to build on previously acquired knowledge was not so intimidating.

Like Michael, Emily Tam had family ties to the medical profession and these ties were a similar early influence in her career choice.

They also have in common a science undergraduate education in a didactic learning institution. Their experience is somewhat different, however, in the way they have adapted to a self-directed learning environment at McMaster. Emily tells the story of how she managed to resolve the dilemma of balancing content with process:

I have always considered medicine as a career choice because it has been a large part of my life for as long as I can remember. From a very young age, I was fascinated whenever I heard my dad, an emergency doctor, talk about his day at work.

I believe his experiences to be in large part responsible for my very early interest in the human

body.

That interest was further stimulated when I got to high school. I enjoyed my science classes, especially human biology, which is why in university I chose to major in the subject. The program I chose offered breadth and flexibility and the concepts I learned in my courses prepared me for the medical sciences. The program also offered many problem-solving opportunities via individual assignments and small group laboratory experiments, and therefore facilitated my adjustment to the small group tutorials in problem-based learning (PBL) at McMaster.

Adjusting to PBL has been a greater challenge than working within a traditional didactic environment.

Although I had experienced small group learning activities during my undergraduate years, it was quite a different experience from PBL in McMaster University's MD Programme. At McMaster, students set their own learning objectives after generating issues from a clinical health care problem. While tutorials are facilitated by the tutors, it is the onus of the students to manage, focus and conduct tutorial discussions. Although my undergraduate tutorial courses prepared me for group work and collaboration, they were still in large part dictated by tutors and were very much teacher-centered.

Initially, I found it challenging adjusting to McMaster's emphasis on student-centered learning. I felt insecure learning without the active contribution of a tutor or professor, and without an overt study direction, knowledge domains, and concrete learning boundaries. I was not accustomed to having to gauge my own learning and always felt I had studied more material than was appropriate for tutorial.

As I had expected before I began McMaster medical school, Unit 1 provided an opportunity to enjoy the freedom of problem-exploration, problem-solving and setting my own learning boundaries.

At the same time, I often felt lost because I did

not have a well-defined amount of material to learn.

I felt the urge for didactic teaching and formal lectures to aid my learning. As a result, I did not always feel confident contributing during tutorials, even though I felt I had adequately prepared for each tutorial. Eventually I was able to increase my perspective on what constitutes an appropriate level of preparation and take a greater role in the group learning process. This happened through practice with interactive learning with my peers, synthesizing information in tutorial, and partly by a trial and error approach.

Just when I had found a comfort level with PBL by the middle of Unit 1, a serious illness left me unable to attend tutorials and classes for over a week. I tried as best as I could to cover all objectives while I was unwell, but my time away from tutorial made me realize how important tutorials are in my learning - specifically in gauging how well I had learned my objectives as well in gauging how much of the material I had researched was essential. Feedback from my group indicated that my absence had a negative effect on group function. In essence, my time away from tutorial demonstrated the importance of learning through a group approach, as compared to learning objectives individually. Moreover, coming together to have group discussions is a great way of reviewing and self-testing. Needless to say, I felt insecure upon returning to tutorials because I had missed the most crucial aspect of learning medicine at McMaster - PBL. I had difficulty rebuilding the confidence I had gained during the first half of Unit 1 and struggled to find secure footing within the group.

In Unit 2 I was able to take on a more active role, as the new group facilitated my integration into the new group dynamics and helped redefine my role in tutorial. In Unit 1 I was considered the "quiet one", and so in the next unit I made an effort to take more initiative by contributing more

to discussions and explaining concepts. Becoming more comfortable with this new role took time, but I had a very encouraging group that actively enabled my participation.

Unit 2 - a unit that covers the cardiovascular, renal, and respiratory systems - is known to be heavy on biological concepts and knowledge.

Since I had steadily built up my PBL skills during Unit 1, I am now able to devote more time to content rather than process and therefore satisfy my expectation of learning a substantial amount of information. Subsequently, my need has shifted towards striking the balance between thoroughly understanding my group's objectives and satisfying my personal, detail-driven objectives.

In contrast to Emily, Prachi Parikh had prior experience with PBL and therefore started the medical program at McMaster more confident in what to expect. As Prachi relates, however, prior PBL exposure does not necessarily make the adjustment any less challenging:

I was never one of those individuals who always knew she wanted to be a doctor. In high school, it just so happened that the subjects I enjoyed most were the biological sciences. When I entered university from high school, it was by process of elimination - together with the near-conviction that my career was heading somewhere in the field of health - that I chose a health sciences program. Through personal, educational and intellectual growth during my undergraduate years, I finally decided to focus specifically on the field of medicine.

It was a decision I had hesitated to make due to my lack of self-confidence and my concerns for personal success in such a competitive field. As I grew, however, I realized that I was a capable individual and that I should not undermine what I

could offer in this field and what it could offer me. I also realized that I am a very ambitious

I decided to write the MCAT during the summer of my second year of university because all the relevant material would still be fresh in my head.

I applied to medical school early in my third year, hoping to get accepted, but, failing that, to get some practice writing the application and giving an interview. To the extent that I had completed an excellent undergraduate program, I felt well prepared for and well suited to medical school.

The McMaster undergraduate health sciences program in which I was enrolled was a PBL program that had been newly established. Despite being initially very skeptical about PBL, in the end the program left me feeling more confident in my ability to learn, my ability to interact in a group, to find information and critically appraise articles.

My program also made me comfortable with the fact that I will never know everything and that I will always have my limitations.

In combination with my various volunteer endeavors and my MCAT scores, my science background qualified me to apply to all five Ontario medical schools, which I did. However, McMaster was always my first choice. I attribute this preference to my three years in an undergraduate PBL course.

Because I was never one who enjoyed lecture-style learning, PBL was completely conducive to my learning needs.

Although my level of preparation and suitability signified a great deal in the McMaster interview, my comfort and ease with the video analysis and mini-tutorial parts of the interview probably made a large contribution to my eventual selection. Naturally I had gained a lot of confidence in these areas merely through practice and experience.

Aside from these things, I think that working in groups and in close contact with faculty members in my undergrad made me more comfortable

speaking with people of authority and allowed me to be comfortable hearing my own voice. I believe this must have helped me during my personal interview as well.

I found out that I got accepted to both McMaster and the University of Western Ontario on the same day. Immediately I told my parents to accept McMaster on my behalf. At the time of hearing the news, I happened to be traveling in a foreign country and under these unique circumstances, I did not have time to really absorb the fact that I had been accepted, much less contemplate my expectations. It wasn't until two weeks before school started when I arrived back in Canada that I really had time to think about what it would be like. I had so much faith in PBL that I was not at all worried about getting my medical education entirely in this format. I assumed it would be just as easy and fulfilling as it was in undergrad. To my surprise, PBL in medical school was very different from PBL in my undergraduate program.

It was entirely group oriented, truly self-directed and there was such a diverse group of people that it was a lot harder to find my role within the group.

This initial experience led me to realize that PBL can mean many different things. In my undergrad it was more supplemental to the core curriculum, whereas in medical school it was the sole basis of the core curriculum - a fact that initially alarmed me. As well, at McMaster medical school there are people present from all walks of life and that really made a difference when it came to establishing group dynamics. For example, the biggest challenge in Unit 1 was learning to work in the environment provided by my tutor. In undergrad, we did not have tutors for each individual group and were not really forced to evaluate our contribution to the group. My Unit 1 tutor constantly demanded evaluation from us and I found this to be extremely challenging in the beginning. As

time went on, however, I realized the great value in not only recognizing the strengths and weaknesses in myself and my group, but knowing how to effectively convey these thoughts in an acceptable manner. I have never had to face up to my own limitations as much as I did in Unit 1, and it felt freeing to accept them and try to improve on them.

The transition from Unit 1 to Unit 2 was an enormous change for me. In Unit 2 I felt more pressure simply as a consequence of the amount and complexity of the material we were expected to cover. The biggest obstacle I faced on a consistent basis in Unit 2 was the time limitation we regularly experienced with each topic. In contrast, in Unit 1, there always seemed to be abundant time to cover the material. Unit 2 was a time of repeated internal struggles regarding whether or not I had studied enough, studied the relevant material, and retrieved enough resources. One of the most frustrating things about Unit 2 was that at the end of each subunit, I could list a thousand topics that our group did not address. This is something that I am forced to confront and accept continually.

Mara Cole, in contrast to Prachi, has always wanted to be a doctor and also unlike her, was somewhat ambivalent about which school to attend. She describes her initial skepticism about being the kind of student McMaster would value and her subsequent surprise at being accepted. She also elaborates on the way that PBL has forced her to confront her limitations and take a leap of faith into the unknown.

Like so many other students in medical school, I have always wanted to be a doctor. For that reason, it made no difference to me which medical school I attended; it only mattered that I attended somewhere. With this in mind, I applied to various

medical schools throughout the province. The application process was grueling, as were the many steps I needed to take beforehand to ensure that I would be deemed a "qualified" candidate.

Apart from the numerous pre-requisite courses I had to take, I volunteered in a variety of health care facilities in order to lend credibility to my desire to work in the medical field. I also participated in some academic research, an activity which, according to the various medical professionals I spoke to, would make me an even more competitive applicant for a wide range of medical schools.

In comparison to the other schools, the application for McMaster was the most difficult for me. To a large extent, this was because I found it hard to determine if I was the type of candidate McMaster wanted. I considered myself a fairly "typical" applicant, in that I had excellent grades and met the standard application criteria. However, in my mind nothing exceptional in my autobiographical sketch distinguished me from the other applicants.

For example, I had not traveled the world and worked with underprivileged children, nor had I started and finished my own clinical research trial.

For this reason, I did not pin all my hopes on McMaster.

Therefore, I reacted with great surprise when McMaster was the first school to accept me. I felt privileged because McMaster's long-standing reputation of innovative medical education rests on its commitment to building a class full of diverse and interesting individuals. In spite of this, I was also worried. What if McMaster's philosophy and learning style was not appropriate for my learning needs? When the excitement of my acceptance eventually died down, I was faced with the reality of a completely new school, a new city, and more importantly, a very different academic environment compared with the traditional didactic learning culture I was used to in my undergraduate years.

At the start of the medical school year at McMaster I had serious reservations. The idea of learning predominantly in a small group setting was very new and frightening to me. How could I possibly learn everything I needed to know in the absence of professionally delivered lectures? Twenty weeks into the program, I now realize that my first mistake was assuming that all the knowledge and skills I would ever need in order to be a successful physician would be acquired in three years of medical school. The philosophy at McMaster is that medical education is largely about the process of learning how to learn, and this process does not end on graduation, but will continue throughout a physician's entire medical career. Once I appreciated this, I further came to realize that the purpose of my medical school education was to acquire the skills needed to successfully and continuously learn in a health care setting. For this reason, it is fitting that most of our knowledge at McMaster medical school is gained in a problem-based learning (PBL) format, where we can put a disease into its appropriate context by using true-to-life patient scenarios. Coming to such an understanding helped me gain faith and confidence in the program.

Throughout Unit I, I learned to be open to McMaster's philosophy and to the process involved in PBL. I challenged my reservations and preconceptions regarding PBL and, as many second year medical students recommended, I "put my faith in the system". Along with my other group members, I became progressively more trusting of the McMaster learning environment and its accompanying PBL culture. As I worked through clinical cases, often with real or simulated patients, I grew my ability to incorporate new material into my existing knowledge domain.

I credit this ability to incorporate information to the PBL format because it is easier to synthesize information when there is a professional context

in which it can be placed. But synthesis of new and old material is only one of the skills I have acquired by the end of Unit 1. PBL has also given me occasion to reflect on myself and my behaviour.

I consider myself to be a perfectionist, and I tend to shy away from situations in which I have to face uncertainties. I quickly learned that there is no room for perfectionism in PBL tutorials, mainly because it prevented me from feeling confident in my contributions. My perfectionism was a large reason why my initial contributions in Unit 1 tutorial group were few and far between. Now more confident in facing uncertainties, in Unit 2 I am more comfortable making a contribution to the group even if there are still gaps in my learning because I trust that my fellow group members will attempt to fill those gaps. This element of reciprocity that exists between group members in my previous and current groups is the essence of PBL to me.

Karen Deeth is the only one in her tutorial group who has prior experience as a health professional. She is also the only group member who is a wife and mother. Her journey to and experiences with PBL at McMaster and is therefore one that involves not just her, but her whole family. She tells what it's like to return to school after many years of satisfying career and family life:

Before starting medical school at McMaster, I had been studying and working in the nursing profession for twenty years. In spite of the great satisfaction I found in my career, I realized that I needed to continue to build my skills and knowledge and that studying medicine could accomplish this in a way that no other choice of career would.

Indeed, my nursing experience - which included tertiary care in medicine, surgery, emergency and critical care, as well as public health - had prepared

me well for extending my learning to medicine.

For me, preparing for medical school also meant preparing my family. As a married mother of three young children, I faced different challenges for success in a demanding academic program than I did as an undergraduate. Ensuring child care in my absence and planning for adequate quality time with my family would require far more balance and organization than I had ever had to strive for during my undergraduate years. As I would discover, setting realistic goals and limits is integral in establishing this necessary balance.

I was probably accepted to McMaster because my professional nursing experience, in combination with my maturity, contributed to the view that I was a well rounded candidate. No doubt my high academic standing and previous exposure to a form of PBL also worked in my favour in the admissions process at McMaster.

McMaster was my first and only choice of medical schools for a number of reasons. Because my family home was established in proximity to McMaster and my children were well settled in their schools, I was hesitant to uproot and move to another city. For this reason, the medical program at the University of Toronto could have been an alternate choice. Even so, McMaster stood out as a superior school for my needs. McMaster had in its favour a three-year program, in contrast to the traditional four-year program. More importantly, I believed the learning environment at McMaster would compliment my learning style. As a visual, contextual and hands-on learner, I believed McMaster's PBL environment would better facilitate my acquisition of knowledge. Having already obtained a degree in nursing at McMaster, I came equipped with qualities that would facilitate my learning in its medical school: academic grounding in the basic sciences, exposure to various patient populations and essential group working skills.

However, as I was to discover, the PBL utilized in the McMaster nursing program was quite different from the PBL I am now experiencing in McMaster medicine. PBL in the nursing program was applied as a complementary and alternative teaching method, whereas PBL in medicine is the backbone and platform of all learning in the program.

Since beginning the program, my feelings of confidence have swung between highs and lows. Clinical skills, discussions and scenarios have a comfortable familiarity and elevate my sense of confidence, whereas academic discussions on such topics as sub-cellular mechanisms serve to highlight some of my weaknesses and therefore decrease my confidence. On starting the program I felt that my experiences and education had prepared me well, but I could also appreciate that eleven years had passed since my undergraduate career. This meant that good study habits would have to be re-established. This was especially necessary as my main apprehension related to my lack of current knowledge in the basic sciences.

Insofar as her educational background is unrelated to the medical sciences, Rachael Seib is another non-traditional medical student at McMaster. Her desire to become a physician has a comparatively short history, and was preceded by a longer history of studying literature. She describes the thought processes that led to the conviction that the practice of medicine is another face of the art of reading and telling fiction:

It's often assumed that medical students with science backgrounds have always wanted to be doctors, and, more often than not, that explanation is usually sufficient to withstand further inquiry.

For a literature student, matters are presumed to be quite different. After all, since the most direct

path to medical school lies through a science education, it only makes sense that those with lifelong medical ambitions would not choose to major in classical languages in their undergraduate education. It is quite natural to speculate that medical students with humanities backgrounds must have experienced a redirection in their careers or education. This is particularly true when a student's previous discipline belongs to the pure humanities, such as literature or philosophy, where problems pertaining to human nature and the meaning of existence are addressed, but do not have direct application to human wellness in the way that the other "non-science" disciplines do, such as anthropology or psychology.

For me, an English literature graduate, the idea of medicine as a "new direction" was an effortless and plausible foundation on which to base my answer to the question of "why medicine?"

After all, university schools, faculties and departments are for the most part discrete entities, and even while I have always been a proponent of the idea that knowledge is a continuum and resistant to compartmentalization, a certain pragmatism has always led me to concede that in actual fact things work quite differently. It was that same pragmatism which led me, at least in the course of my medical school interviews, to explain my interest in medicine in terms of a new interest or priority that caused me to leave one discipline for another.

However plausible that explanation, I now have the hindsight to realize that it was at the very least a shorthand explanation that didn't do justice to the more complex motives that underlie all monumental human decisions. At the heart of this realization lay an admission of how my love of literature was irreversibly fused to my nature, and could not be abandoned, or even temporarily put aside, in preference for any career or, for that

matter, any other life goal. This is when I came to ask a critical question of myself: could a career as a physician take my study of fiction to the next and necessary level?

On the surface, it seems an odd question to ask. Anyone looking to give greater attention to literature would seem to benefit more from a different career decision, such as writing or research.

Yet these reflex reactions to my critical question only serve to illustrate an important point: reflective living (as represented by literature) and active living (as represented by doctoring) have been walled off in mutually exclusive compartments.

I believe that one of the consequences of this compartmentalization is that the study of literature is relegated to an elite membership in an ever-shrinking, albeit increasingly vital, cultural community.

That membership often comes at the price of estrangement from, or lack of relevance in, one's larger, more immediate community.

So far I've appeared to answer the question of "why medicine" with another question, "why not literature?" That one question provokes the other in my mind is an indication of the close relationship between literature and medicine. In fact, they can be regarded as two sides of the same coin, and that coin is the toll one pays for meaningful interaction with one's world.

Around the time medicine was beginning to interest me, I was observing that, thanks to technological advances, the arena in which meaningful communication with individuals is possible is rapidly shrinking, such that it is now possible to go through the motions of our daily lives with minimal human interaction. How many professions exist which afford the opportunity for interacting with people in a way that is essential for another person's well-being? There are perhaps half a dozen.

The novel and other art forms remain critical media through which meaningful communication

still happens. But they are limited by the size and loyalty of their audience. Medicine, on the other hand, spares no one. It is perhaps the only profession where the diversity of its "audience" is limited only by the community in which one practices.

And no other profession encounters persons in their most vulnerable selves as consistently as medicine does. Illness has a way of deconstructing and de-individualizing people to their most essential components - their body parts - while at the same time exposing each person's uniqueness through the telling of individual stories. And perhaps this is ultimately what is most attractive to me about medicine: it is about the stories people tell of themselves when reduced to the naked commonness that illness demands.

When people are well, the stories they tell are often circumscribed by a trivial commonness. But sickness is a common denominator, and when people experience it, it suddenly becomes necessary for them to create a meaningful dialogue about themselves which no one else shares, effectively restoring their individuality just when they need it most.

And so medicine and literature are different expressions of the same thirst. That thirst is for the most essential component of human experience: the human story. As a reader I go to the novel to discover it. As a medical student, I will one day go to the bedside to find it. And if my hunch proves correct, it will be the same story in both cases.

At the time of writing this, I am twenty weeks into the McMaster medical school program. It is no accident that I was accepted into a school whose philosophy of self-directed, problem-based learning implies that the most important prerequisite for becoming a doctor is a strong independent mind, and a quest for relevance. It is through the lens of this program and the rigorous self-evaluation that McMaster encourages, that my understanding

of "why medicine?" takes on greater focus. I am in medicine, and at McMaster medicine in particular, because of a deep desire to be relevant in my world. The only other equally relevant profession I know is that of writing fiction. Incidentally, the latter exacts just as heavy a toll upon the person who practices it as does medicine. The choice between the two is therefore not a choice of which profession brings the easiest work life. The choice between the two - if such a choice can be said to exist at all - has more to do with a choice of what process to take to achieve one's goal. McMaster medicine appreciates the importance of the right process, and correctly so. The right process is highly relevant - in medicine, and in life.

Dr. Guang-Tai Song , a novice PBL advocate in China and a young faculty member of the School of Dentistry at Wuhan University , joins our tutorial group as an observer during his two-month visit at McMaster University. He describes his observation and relays it to the current reform of Health Sciences education in China.

In China today, education in all disciplines of health sciences, such as medicine, dentistry and nursing has been based on the traditional pedagogic methods. Instruction for learning is typically teacher-centered; progress of learning is examination-driven; curriculum is compartmentalized and often congested; knowledge base does not always bear professional relevance. There is a persistent belief among teachers that students are not capable of learning effectively without teachers' didactic lectures. This unchallenged enigma perpetuated itself to the extent making students admittance to accept spoon-feeding being the norm. As a consequence, learning becomes passive and unchallenging. This phenomenon, however, is not

unique to the situation in China, it may very well be a global phenomenon today.

At the turn of the millennium, following suit of many other countries in the Asia Pacific region, experimentation with the innovative PBL approach to education in health sciences pioneered by McMaster University sprouted in a limited number of universities in China, including our university at Wuhan. In 2001, the Pediatric Dentistry at my school adopted a small group tutorial type of teaching and learning. Internal funding was also made regularly available for our teachers to gain PBL experience by visiting institutions abroad.

When I was awarded an opportunity to come to Canada, I intended to visit McMaster University, but instead I was assigned to visit the School of Dentistry at the University of Toronto, because McMaster does not have a program in Dentistry.

Although my experience at the University of Toronto has been rewarding, the educational instructions at the University of Toronto was of primarily traditional nature. To further fulfill my objectives of visiting Canada, I communicated with Professor CY Kwan at McMaster University one day to inquire about the possibility of shadowing his PBL tutorial group. I was surprisingly pleased that he would arrange to have me as an observer in his Unit-2 tutorial group with the agreement of his students.

Several aspects of Dr. Kwan's PBL tutorials stood out throughout my 2-month observation.

First, the tutorials were truly learner-centered. The students took responsibilities in their own learning and collectively made plans and drew their learning roadmap. The learning in PBL tutorial was highly process-oriented as opposed to content-oriented in traditional tutorials. This process fosters active learning via inquiry as opposed to the traditional rote learning via memorization. It also motivates students to take on interpersonal "people-

skills" through effective communication and proper professional behavior. The learner-active PBL tutorial process could pose a daunting challenge to students in China, as those students, being high school graduates, may be less matured in dealing with people skills or may be too deeply embedded in a historically passive academic culture to take an active attitude in managing their own learning.

Second, the tutor does not teach in the traditional sense. In Unit-2, these students learn about concepts in cardiovascular, renal and respiratory systems.

Although Dr. Kwan's research expertise has been in the area of hypertension, he appears to effectively refrain himself from "lecturing" or "steering" students' learning directions on this topic. Rather, he prompted students to learn from the "big picture" using drawings and flow charts. When in doubt about the content in students' discussion, Dr. Kwan poses questions to challenge the students to think and explore instead of giving out corrections or "answers". He sometimes refrained himself from correcting the "major mistakes" immediately in order to let the students to reflect and identify the mistake themselves. This is a tutor skill which is different from the role of the traditional teacher and needs intensive training and experience via practice. In view of the traditional and cultural influence on the relationship between teachers and students in China, this aspect could be a major obstacle to overcome.

The third prominent feature is that the learning via PBL is professionally sound and relevant. PBL at McMaster emphasizes effective horizontal integration of health science knowledge and skills and there is no sharp demarcation of disciplinary boundaries, such as anatomy, biochemistry, physiology, pharmacology, microbiology, etc. It is a learn-as-you-need approach following a set of specially designed clinical health care problems. Also, the learning of basic science is supplemented with

paralleling sessions in communication and professional skill to bring out more professional relevance and to enhance vertical integration by early clinical exposure via taking electives (students taking segments of 2-4 weeks shadowing a physician in a clinic or a hospital). Such a highly integrated curriculum in PBL format has not been daringly attempted in China. The existing novice PBL-like program in China is primarily at an experimental stage with PBL introduced as a teaching method in one specific course or module within a largely traditional curricular environment - a vague PBL-hybrid model.

The fourth significant aspect of PBL at McMaster is that the students' learning is not examination-driven as in most traditional schools.

Their learning is refined and improved through cooperative learning, critical thinking, effective feedback and self-awareness. This is done via group-evaluation, self-evaluation, peer-evaluation and tutor-evaluation. While traditional examinations focus primarily on the retention of factual knowledge, without concerns on the process of learning and, some times, at the expense of professional behavior (because of its competitive nature), the evaluation criteria in PBL format include contributions to the learning process, professional behavior in addition to contribution to knowledge content, thus favoring cooperative and collaborative attitudes in learning.

The last and not the least interesting observation is the open admission policy adopted by McMaster medical school. I was surprised to find that a group member was a graduate of English literature and another student member was a mother of three and had been a nurse for more than a decade.

Even in North America, students with such background deficient in initial biological sciences preparation are very likely to be rejected by medical schools. In China, numerical scores of the highly competitive entrance examination, especially in

scientific subjects, represent practically the sole yardstick for admission into professional health institutes.

I hope that my fortunate experience as an observer in a PBL tutorial group at McMaster will serve as a significant aspiration as well as inspiration for educational reform in China. It should be appreciated that PBL is not just another teaching method, it is an attitude as well as a culture. To achieve the educational objectives of the innovative PBL philosophy, students' attitude, teachers' mindset and institutions' academic culture all need to be changed, and this change is not a trivial matter and has to be dealt with vision, passion and proficiency.

"To the extent that a physician practices medicine in a community, he is present at the interface of science and culture. His is the unique task of making sense out of the wealth of scientific data so that it may benefit the patient, and, conversely, of teaching the scientist the value of the study of mankind. However, it is in this area - medicine's relationship to man's culture - that we are weakest."

Robert Buxbau, MD^[7]

Traditionally, medical schools look for students who hit high scores in examinations, especially those for science courses. At McMaster, we look for students who are collaborative, communicative, critical/professional, intelligent, ethical, giving of oneself/compassionate and aware of local health care system. Therefore, the preferred candidates would be those students who are likely to be able to better relate medicine to man's culture, in which the nurturing of physical and mental well-being is a community-based, self-directed, attitude-driven and life-long process.

As an assessor during the annual admission process, Dr. Kwan enjoys reading the applicants'

responses to a set of 15 questions, which include, for example, several open-ended questions, such as, why do you want to study medicine (give evidence)? How do you know that you have learned enough? What are the lessons learned from a significant failure (give an example)? How do you deal with stress in life (give an example)? Typically, in recent years, 3,000 candidates have applied for admission into the Health Sciences center at McMaster University every year and about 400 are selected based on the academic transcript (with GPA>3 over at least 3-year undergraduate education irrespective of subject major) and the responses to the 15 questions.

Subsequently, 400 selected candidates were invited for interview to further screen down to a final list of 130-140. The interview also included placing these students in small-groups (6 members per group) and run a short (15 min) PBL tutorial which was monitored by assessors behind a one-way mirror. Starting this year, the simulated tutorial sessions are replaced by an OSCE-like assessment using 12 stations - this is called multiple mini-interview (MMI). The main purpose of this final stage of selection is to assess not only the cognitive attributes, but also the affective and reflective attributes of the candidates.

The open-door admission policy at McMaster is in line with the cultural approach to medicine which helps foster diversities (gender, age, ethnicity, training, etc) in the health care system. This tutorial group of 6, involves one male and 5 female students (as a whole, currently >70% of the medical students in the McMaster medical school are female). Two students are from the visible minority groups. Only three students are graduates with strictly scientific background. It is interesting to note that Dr. Orbinski, the President of the Doctors Without Borders and a McMaster graduate in medicine received a Nobel Peace Award on behalf of the altruistic health

organization in 2001. With his undergraduate degree in political sciences, Dr. Orbinski would not have been granted admission by any other traditional medical schools. McMaster appreciated and recognized the potential of his interest in political sciences in relation to global health with special reference to war-inflicted human suffering

It would be appropriate to conclude this communication with another quote taken from a paper written in 1996 by Professor Robert C. Buxbaum^[7], a medical educator of Harvard Medical School:

"An interest in literature, social sciences, or the arts should be encouraged, rather than pushed aside, during the four years of medical school and the following postgraduate years; the degree of proficiency attained in these fields might be expected to add to the quality of the student's intellect. Moreover, the ability to use basic principles - to erect a framework against which any academic problem might be measured - is an invaluable attribute which will remain longer with the student in his practicing life than any list of biochemical formulae his instructors may feel it necessary for him to memorize this year and recall a generation hence."

The above quote summarizes the spirit of PBL in 1965 when McMaster University just started building her new medical school and implementing an innovative PBL curriculum^[8]. A decade later, Harvard medical school also successfully put forward a "new pathway curriculum"^[9] in which PBL was adopted to supplement and complement the traditional curriculum conforming to a prototype hybrid curriculum.

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