Review Article

Learning from other professions

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Abstract

In the last few years, medical education has become evidence-based and structured. It has incorporated principles of learning used in professions other than medicine. Safety, simulators and checklists have been learned from aviation industry. Handover protocols are borrowed from oil industry. Legal profession has emphasized the importance of critical thinking. Even the modern war colleges have developed learning strategies like war games and mock scenarios which can be assimilated in our postgraduate medical education. Modern-day medical education is looking for new horizons and innovations. Many professions other than traditional medical education may provide the necessary guidelines for modernisation.

Keywords: Medical education, Educational strategies, Curriculum, Critical thinking, Competencies.

Introduction

Medical education has been transformed in the last few years from the traditional way of teaching to the radical views of problem-based learning, student-centered curricula and many other models. We have even incorporated principles used in teaching young children in primary schools. All these innovations did not come about overnight, but a painstaking development from Plato to Piaget. Historically, the medical profession has learned from other professions and industry, and incorporated their experiences in our postgraduate teaching. Of course, they have learned from us greatly, too.

Lessons from Aviation Industry — Safety & Checklists:

There is an undoubted resonance between the worlds of aviation, oil exploration, mining and medicine. All operate in environments that are unforgiving of error and involve effective teamwork. The aviation industry has tapped into what is now a considerable body of knowledge about the limitations to human performance. To this end the industry puts considerable effort into Crew Resource Management. Since the first half of the 20th century, both aviation and surgery were generally acknowledged as risky enterprises, with both pilots and surgeons often cast in the role of courageous heroes. Times have now moved on and commercial passengers and patients attending hospitals do not expect to die or to be seriously hurt in the process.[1]

The first fatal airplane crash in history occurred nearly 100 years ago, on September 17, 1908, when army lieutenant Thomas Selfridge died in a failed flight attempt with the aviation pioneer Orville Wright. Since that time, aviation safety standards have significantly improved.[2] Currently, the risk for an American dying in an airplane crash is about 1:500,000, compared to a 1:20,000 chance of dying in a car accident. In the field of medicine, it was not until the shocking report by the Institute of Medicine in 1999 revealed that 100,000 patients die in the United States every year as a consequence of medical errors,[3] when we began to realise that there is something "wrong with the system". While this unacceptably high number has been chronically under-rated in public recognition, an extrapolation of these statistics to professional aviation equals to about 200 jumbo jet crashes per year, or one 747 crash every other day. This dramatic insight led to the design of the "100,000 lives" campaign by the Institute for Healthcare Improvement in 2004.[4] By 2006, the campaign had surpassed its initial goal by saving more than 120,000 lives through the implementation of increased patient safety standards and algorithms.[4] These include the recent implementation of a standardised surgical "time-out" to ensure the correct patient identity and correct procedure is performed at the correct surgical site.[5] In addition, the implementation of formal, structured peri-operative briefings in the operating room have been shown to significantly reduce the incidence of wrong site surgeries.[6] All these are lessons learned from another profession.

Not everything is done better in aviation. For instance, all airline passengers are expected to exit the plane in the same condition as they entered. In medicine, we expect that they will leave in a better condition. In this regard at least, the airlines should learn from us.[7]

Lessons from Formula 1 Car Racing and Oil Industry — Handover Protocols:

The analogy of a Formula 1 pit-stop has improved the quality and safety of patients during handover from surgery to intensive care.[8] Thus an expertise from another

industry has been extrapolated to improve patient safety by developing new handover protocols.[9] Lessons from industries such as oil exploration and mining have provided insights into how safety in the healthcare field may be improved.[10] The lesson learned from the Piper Alpha oil rig disaster (1988) reinforced the importance of formal procedure of shift handovers,[11] another lesson incorporated in medical handovers these days.

Learning from Legal Profession — Critical Thinking:

Contrary to what modern medical education proposes, some people in other professions, like the law, have their own reservations. So what can medical education learn from legal education? First, law schools have demonstrated that critical thinking can be taught effectively and efficiently in large classes. The dialectical technique used in first-year law classrooms (usually referred to as the Socratic Method) is a problem-solving exploration that cultivates critical thinking.

A medical school also provides lectures, drills, and memorisation in its initial phases. Many medical students view this passive learning in large lecture halls as an obstacle they must overcome before getting to the real thing — the patient contact and clinical application. Law school, on the other hand, starts with problem-solving activity that is tough but exciting — the analysis and argumentative use of legal material. Second, legal education's reduced emphasis on clinical education and the absence of formal, prescribed modes of apprenticeship training raise questions that medical educators should consider. Legal education errs in giving too little exposure to clinical experience; does medical education err at the other extreme of devoting too much time to routine patient care narrowly oriented to body organs rather than the whole being of the patient? There are possibilities here both for improving education and reducing its length and cost.[12]

Lessons from the Military War Colleges — Leadership, Cme, Teamwork:

The history of war colleges is as old as the wars themselves. These have always been the seats of learning in the art and science of warfare, usually reserved for those destined to rise to the higher ranks, with responsibilities for higher strategy. The US Naval War College[13] handbook shows different educational methodologies, with lot of emphasis on effects. The desired effect is a group of leaders of character who have trust and confidence in each other, are operationally and strategically minded, critical thinkers, proficient in joint matters, and skilled joint war fighters. Something similar is required of our medical graduates.

Similar to the military promotional system, the Royal College of Surgeons of UK has issued guidelines, which make it clear that basic surgical trainees will be demoted if they are unsuccessful in achieving the desired competencies.[14] These war colleges strive to provide an optimal training environment during the course, which is of paramount importance for any educational strategy used either in combination or separately.[15]

Command and Staff College, Quetta:

It is generally thought that the armed forces are quite conservative, follow traditional systems of education and enforce dogmatic doctrines. Spending time at the Command and Staff College in Quetta, Pakistan, is an opportunity for a medical educationist to compare the educational systems, and find strengths which may be incorporated in our methodologies.

If we critically analyse the competencies targeted at the Staff College, we will see that all these maybe are very similar to the learning outcomes mentioned in the General Medical Council's "Tomorrow's Doctors."[16] The mission of the Staff College is to "Impart necessary education to selected officers, enabling them to assume staff appointments and to inculcate in them personal and professional ethics and abilities to prepare them for higher roles". Stress is laid on the need for good teamwork. Practicable, commonsense solutions are sought to problems. Originality is encouraged. The ultimate objective is to equip the future officers to be able to handle any kind of staff or command problem with an analytical, educated and methodical approach whereby reasonably competent options are highlighted. In order to widen the officers' mental horizon they are also exposed to a cross-section of guest speakers on several subjects. Similar objectives are laid down by other such colleges around the world.[17]

The college designs, develops, implements and ultimately evaluates the study programmes that prepare officers for higher appointments. It grooms officers to assume greater responsibilities of command as they grow in service. (Systems approach)

To ensure progressive development of the course, the syllabus is reviewed each year keeping in view the current environment. The faculty members critically review and analyse the aim and scope of each subject, so as to bring them in harmony with the latest doctrines (Curricular evaluation).

The college uses the latest methodology and modern technology to provide the highest quality of education and learning environment. The syndicate (small group of 10 students) method is employed to exchange ideas and benefit from the varied experiences, qualifications and opinions of

Pakistani and allied officers (Small groups). Self-paced instruction is used for learning facts, techniques and procedures (Principles of Adult Learning). The College thus blends various methods of teaching techniques to optimise learning.

Problem Based Learning is used. There is daily continuous assessment of the learners, with in-built feedback system. This arrangement provides a fair chance to each student officer for evaluation and assessment of his performance on the course. This can only be brought about if the faculty-student ratio of 1:6 is available, as in the staff college.

The pre-course study package of 16 weeks enables selected officers to achieve uniform knowledge base through progressive learning of essential military subjects and to develop correct orientation for subsequent integration. Prior to the Staff Course, 4 weeks of theoretical learning is organised. Its mandate is to enable the students to understand the impact of technology on military operations and its application in their own environment. Most of the instructions are imparted on a syndicate basis.

Strictly based on the principles of adult learning, the course is a self-generating entity and though the student officers have a Directing Staff, learning and teaching is through a process of individual study, group discussions, critiques and implementation of plans and formulation of written papers. The course, generally, is challenging and demands considerable interest from the participants.

The curriculum has been divided into three main groups of studies, i.e., Professional Studies, Developmental Studies and Research Studies. These same themes are desired in medical postgraduate training. Professional Studies include building the theoretical background, building of concepts, training of others, routine staff work and specific learning. War Games or role play is a method where scenario learning is used. In these exercises, students are provided the opportunity to apply the acquired knowledge and deepen their understanding of tactics. They practise skills, techniques and procedures and get the opportunity to analyse problems, develop solutions, write, speak and interact with other staff members. Developmental Studies reinforce professional studies and the contents are designed to expand a student's horizon, encouraging maturity of thought. This group of studies primarily consists of strategic studies, analysis papers and seminars. Human Resources Management familiarises the students with leadership concepts and management techniques, something we lack in our postgraduate training.

Analytical Papers are written by the learners in order to develop their ability in grasping the essentials and evolving original and viable options. A number of analytical papers are to be attempted by the students throughout the course. This provides them an opportunity to refine their research and writing skills. Seminars provide a forum to the students for critical study of a subject of professional importance, with a view to recommending doctrinal, organisational and administrative changes. It is based on the principle of 'Peer Teaching', which is already being explored for incorporation into postgraduate medical teaching.

Study tours are organised to enhance the student's awareness of the functioning of other institution. A similar system of exposure of our trainees to other units and hospitals would widen their horizons and they would have a chance to see other experts at work; something which we need to incorporate in our postgraduate curriculum.

Communication skills development is part of the curricular competencies. This needs to be practically emphasised in our postgraduate programmes. The package should be aimed at developing in our graduates the ability to read critically, think analytically and communicate lucidly.

The aim of research studies is to develop an understanding of the research methodology, broaden the outlook of students, deepen their understanding in specific areas and provide stimulus for further studies. This has to be in-built in our postgraduate curriculum, and identified as a competency for the postgraduate students.

Incorporation of Some Other Lessons — Core Competencies, Aptitude, Assessment:

In his opening remarks, Boston University President-ad-interim Aram Chobanian stated that "[e]ach of the professions … faces a different matrix of professional problems, yet none is exempt from the ethical principles humans have formulated throughout the millennia. And all can learn from the others"[18] affects and attitudes because of their abstract nature and fear of subjective assessments have always been neglected or feared. People relegate them to the 'Hidden Curriculum'. Most other professions make an active effort to develop or nurture them in their protégées.

Most of the programmes at under and postgraduate levels clearly identify the competencies. Many of these have enough emphasis on knowledge and skills, but not enough effects. Following are effects gleaned from the curricula of other professions that we need to inculcate in our postgraduate health professionals:

Develop a student's reasoning and decision making abilities, character, expression and team work - Law.[12]

Train to identify a problem, determine the basic issues involved, obtain necessary information, and formulate a response - Aviation.[7]

Attention to the development of intellectual honesty, integrity, professional values and standards - Military Colleges.[13]

Selection Criteria and Aptitude:

All agree that we need to re-visit the selection criteria for admission into medical colleges, as well as postgraduate training. Lot of work and many models have been proposed, many based on selection for Air Force, Armed Forces, National Aeronautics and Space Administration (NASA), Information Technology, industries and some others. Some effort is being made by the surgical colleges of UK and Australia.[19] Our departments of medical education also need to work in this direction.

Assessment Methodologies:

Most certifying institutes would like to operate at the apex of Miller's pyramid.[20] This can probably be only achieved by work-based assessment systems, something which still seems far in the future for our system. The closest that we can achieve and which works in some professions, is a continuous assessment of our trainees through a structured system of formative and summative assessment. This would then allow us to give due weightage to the effects we covet, and which may have reasonable reliability.

Conclusion

Since time immemorial, the profession of art of healing has always held an esteemed position. Its survival has always been in the hands of dedicated professionals who observe, experiment, improve, teach, learn and pass on the knowledge for posterity. At parallel is the growth in industry. In this era of inter-professional learning, it would benefit to learn from others' experiences. The growth of evidence-based education in this post-Flexner era can be further enhanced by a symbiotic relationship with colleagues from other professions. These ideas from simulators to protocols can be easily incorporated after rigorous testing. Our progress and survival resides in a harmonious existence.

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