

An examination of the roles of education and training in the making of a doctor

医師養成における教育と訓練の役割に関する検討

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Abstract: The aim of this paper is to provide some important insights into the roles of education and training of medical students at medical universities and outline some possible innovations to promote the evolution of the medical education system and hopefully graduate better medical practitioners.

Key words: doctor, education, training, change

Introduction

The purpose of medical education is to build knowledge, train necessary skills, develop a spirit of enquiry and foster the values of physicians in a balanced and integrated approach to produce good doctors. As teachers in the Japanese medical education system, our focus should be on the quality of education we provide to medical students and how we can improve their education to fulfill the stated purpose and objectives of our university. But how can we know if those goals are being met? What does the current crisis in Japanese health care tell us about the changes needed in the training of new doctors and nurses? Is the current curriculum designed to meet all the set objectives at a time when the medical health care system in Japan is groaning under the weight of ever-increasing problems? It appears that the status quo is no longer functioning well enough to warrant saving and that change is needed, but before change can be enacted, it is first necessary to understand what needs to be addressed.

In this paper, I will (1) introduce some opinions about what a “good doctor” is, (2) briefly describe how medical curriculums have evolved over time, (3) look at some of the broad objectives of medical schools for making a “good” doctor, (4) define the roles of education and training for medical students, (5) note some of the recent changes that have taken place in medical education generally and their implications, (6) report some of the feedback received from an informal survey of doctors and students, and (7) outline

some possible innovations to promote the evolution of our medical education system and hopefully graduate better medical practitioners.

What is a “good doctor”

When people are sick and in need of medical assistance, they entrust the care of their health and life to a doctor, and hope that the doctor is a good one. But what is a “good doctor” and how are they made? The Cambridge International Dictionary of English (1995) defines “doctor” as “*a person with a medical degree whose job is to treat people who are ill or hurt*”, and “good” as “*very satisfactory because of being pleasant, enjoyable, of high quality, effective or suitable; morally right; behaving well; kind and helpful*”. Putting these two definitions together actually comes very close to the mark in defining what a good doctor is for most people. However, there is no agreed-upon exact measure for determining whether a doctor is good or bad; it is entirely subjective. There is, nevertheless, a vast array of different opinions as to what desirable characteristics such a doctor needs to possess or display in order to win this label. For example, the British Medical Journal¹ asked its readers to respond to the question “what makes a good doctor?” and collated a listing of more than 70 qualities a good doctor should have from 102 responses; these included compassion, understanding, empathy, honesty, competence, commitment, humanity, courage, creativity, a sense of justice, respect, optimism, and grace. A survey of other lists¹¹ of desirable doctor traits and professional values would add accountability, advocacy, altruism, caring, confident, confidentiality, efficient, ethical, a good communicator, a good listener, integrity, knowledgeable, a lifelong learner, possessing the spirit of enquiry, proficient, responsible, self-regulation, self-improvement, and serious.

That any one person should possess all these characteristics opined would be nothing short of miraculous and verging on the divine. In elevating the status of doctors to such exalted levels, patients and their families expect nothing less than perfection from their doctors. Doctors themselves are just as human as their patients, possessing similar faults and foibles, but having had the benefit of six years of medical education and training to be able to perform their job. And considering that the vast majority of medical students don’t graduate their courses with full slates of “A” grades, the pedestal that doctors stand upon is actually quite shaky. There is indeed dark humor in the old joke: “*What do you call the least talented medical student who graduates at the bottom of the class? You call them ‘Doctor’*”. Newly graduated doctors should understand that their learning curve is just starting with their entry into general practice and that it will take a lifetime of commitment to learning just to keep apace with medical developments. The term “good doctor” is therefore quite relative.

In order to make something “good”, the starting point should be good materials to work with, to which good ingredients are added, and molding in an appropriate manner to produce the desired outcome. In other words, to make a good doctor, medical schools first need to select good candidates and then educate them with the necessary blend of knowledge, skills development, critical thinking for problem solving, and medical techniques to produce a doctor who reflects the medical school’s stated objectives and, hopefully, society’s needs.

The evolution of medical curriculums

The history of medical education stretches back to long before there were any medical schools and even before the time of the ancient Greek physician Hippocrates² (*ca.* 460BC – *ca.* 370BC) who is widely regarded as the “father of medicine”. As humans developed and accumulated knowledge related to health care and treatments, this earliest medical knowledge was treasured and passed down from father to son, mother to daughter, and those belonging to the inner circles of traditional healers, usually by word of mouth and imitation. Then, starting in ancient Greece and then flowing through the rest of the civilized world, Hippocrates made a great impact on the teaching and practice of medicine, being credited with many milestone contributions. For example, he developed a systematic approach to the study of medicine, assembled his medical writings and case studies in a Corpus that became a standard reference for doctors to follow, and identified the practice of medicine a distinct profession. Of course, one of his greatest contributions was his prescribing of the professional responsibilities of physicians called the Hippocratic Oath³. In it, the Hippocratic Oath stated that medical knowledge should be solemnly protected and passed along to those selected for the physicians’ inner circles. This apprenticeship model of medical training persisted for many centuries until the nineteenth century. As industrial society rapidly modernized and more doctors were needed, these circles of instruction grew and developed into formalized lecture-style teaching of groups as medical knowledge was increasingly collected, recorded and disseminated. As formal medical training developed, human dissection for anatomy studies was included and in the last one hundred years laboratory studies became standard. Progress was nevertheless slow, piecemeal and without commonality until the beginning of the twentieth century.

The first major change to modern medical education began with the release of the Flexner Report⁴ in 1910. Until this time, medical schools were mainly small business ventures that awarded medical degrees after only one or two years study to anyone who could pay the fees and run by private doctors to supplement their incomes; these courses offered patchwork curriculums, inadequate facilities, and unscientific approaches to both medicine and education. Then in 1904, the American Medical Council set up the Council on Medical Education (CME) to determine how medical education in North America

should be reformed. Two basic standards were proposed; the first was a standard for the minimum necessary education level for admission into a medical school, and the other set out parameters for a basic four-year medical program split between education and clinical hospital training. It was the CME who directed the Carnegie Foundation for the Advancement of Teaching to examine the state of medical education based on its reformist agenda; the Carnegie Foundation in turn commissioned research scholar Abraham Flexner to visit all 155 medical schools in the USA and Canada to assess and report on his findings of medical education. Flexner generalized about the medical schools he visited as seen in this comment:

“Each day students were subjected to interminable lectures and recitations. After a long morning of dissection or a series of quiz sections, they might sit wearily in the afternoon through three or four or even five lectures delivered in methodical fashion by part-time teachers. Evenings were given over to reading and preparation for recitations. If fortunate enough to gain entrance to a hospital, they observed more than participated.”⁴

In Flexner’s view, intellectual medical training based on a scientific foundation was the ideal for modern medical schools. In particular, he regarded the educational program of John Hopkins University as the ideal model for all other schools to emulate; a few years of scientific education followed by several years clinical training in a teaching hospital where research interests would be stimulated by interactions during patient care. A major repercussion of Flexner’s Report was the ensuing closure of the majority of schools that did not meet the high standards set, resulting in medical education becoming much more expensive and fewer doctors being produced. Nearly one hundred year later, the Flexner Report is still chiefly remembered for its achievement in enabling a single model for medical education to become the standard, not only in North America but the world over, that has lasted up to the present day with many of its recommendations still relevant. Nevertheless, Flexner himself, fifteen years after the release of his report, lamented the over-emphasis of the scientific education approach and the exclusion of social and humanistic aspects in doctor training⁵.

The current medical school system in Japan owes much to the foundation created by Flexner’s report, being reconstituted after World War II using the American system as its template. Undergraduate medical programs, such as that at HUSM and other Japanese universities, are generally 6 years long with admission based on an entrance examination taken at the end of high school. Admission to medical school is considered to be the most competitive of university entrance exams; successful candidates are considered an elite group. Medical studies commence with a four year pre-clinical program; students study Liberal Arts for the first one and a half years, which include physics, mathematics, chemistry, and foreign languages, followed by two and a half years of Basic Medicine covering anatomy, physiology,

pharmacology, and immunology. The final two years are concentrated on clinical medicine in a hospital setting. After successful completion of the graduation examination, the graduates sit for the National Medical License examination, and should they pass it, are awarded a Doctor of Medicine (M.D., from the Latin *Medicinae Doctor*) degree (*IGAKU-SHI* in Japanese) and registered with the Ministry of Health, Labor and Welfare, thereby becoming licensed to practice medicine as a physician. Graduates wishing to undertake further studies can enroll in a four-year Ph.D. program and emerge with an *IGAKU-HAKASEI* doctoral degree.

Of course, change continues unabated. Recent reforms to medical curriculums in Japan have seen a directional shift away from conventional teacher-centered education towards more student-centered practices that mimic real-world clinical environments such as problem-based learning, organ-based curricula and Objective Structured Clinical Examinations (OSCE). Even so, not all these reforms have been greeted as positive as implementation subsequently proved to be more problematic than first expected. Despite such teething problems, the momentum of change and evolution of medical curricula in Japan will continue in the years ahead.

Medical school objectives

The natural goal of every medical school should be to produce “good doctors”. Indeed, a reading of the stated goals and objectives of the Hamamatsu University School of Medicine (HUSM) confirms this to be one of its primary tasks:

“The university seeks to achieve three chief objectives; firstly, to grow up excellent clinicians and highly creative researchers...” (see Appendix 1)⁶.

In addition, the university educational objectives for educating and training individuals who successfully enter the university after passing its entrance examination requirement are as follows:

Educational objectives for students of the Medical Faculty:

- 1. to acquire essential knowledge and skills of medicine to solve problems.*
- 2. to learn how to accurately evaluate oneself and how to continue to educate oneself independently.*
- 3. to create a desire for scientific exploration that is essential for those engaged in medicine.*
- 4. to cultivate themselves in ways that enable them to take an active part in the international arena.*
- 5. to learn to be humane and sincere doctors.*⁶

However, the very broad nature of these objectives does not provide a firm enough foundation for the development of a curriculum that meets society’s changing needs and expectations. In addition, attaining such objectives has become ever more difficult to fulfill due to numerous factors such as the rapid pace of medical knowledge expansion, failed reforms of the compulsory education system, demographic changes,

society's heightened expectations of health care providers, bureaucratic mismanagement of the health care system, doctor burnout and time lags in responding to change. The questions that need to be addressed are how should the University identify and quantify its educational objectives and then evaluate if these are being met? How will these objectives be integrated into the curriculum and syllabuses? Does simply passing courses mean that students have satisfied all objectives set for them? These are questions that need to be addressed in a far larger study than this one here.

Other universities are taking a different approach to setting their goals and objectives; they are setting for themselves more detailed points that are easier to assess than the broad brush-stroke approach taken in the past. A good example can be found in the detailed objectives set out by the Queensland University School of Medicine (QUSM)⁷ in Brisbane, Australia (see Appendix 2). QUSM includes many goals and objectives in point-form detail for the various aspects of its medical program, making it easier to implement, monitor and assess. Indeed, it outlines in specific detail how implementation of various objectives is to be carried out, making it clear to administrators, teachers, students and community stakeholders alike. Shiga University of Medical Science in Shiga prefecture, Japan, has also followed this example by more clearly outlining in greater detail their objectives and elements of their curriculum^{8,9}.

Indeed, the actual objectives of many medical universities in Japan have changed significantly since 2004, when the Japanese government changed the status of National Universities to “semiautonomous corporations”, as research and funding pursuits have overpowered teaching and medical education as the prime focus of doctors and administrators' activities. Indeed, the “publish or perish” academic culture is de rigueur at medical universities now, often to the detriment of educational programs. Nevertheless, society still expects medical universities to graduate good doctors. And the only way to graduate good doctors is to have appropriate educational and training programs in place that make up for any prior deficiencies and that can instill the needed knowledge, training and values expected in medical school graduates.

The roles of education and training

Education and training are often easily be mistaken for each other; for example, the Oxford Advanced Learner's Dictionary defines education as “*a process of teaching, training and learning, especially in schools or colleges, to improve knowledge and develop skills.*” But the distinction between these two learning activities, although subtle, is nevertheless an important one. In very simple terms, education can be considered as the imparting of knowledge (book learning), while training involves the acquisition of skills (doing). And even though both are an essential part of learning, the greatest distinction can be made

from their purpose. It can be argued that the main purpose of education is the enhancement of an individual's ability to think and understand and improve their mind so they can achieve their personal life goals; training, on the other hand, is rather a means to developing skills that will be used for practical, developmental, or more economic purposes. Applying this to medicine, the purpose of medical education can be said to be the acquisition of knowledge, building a solid medical knowledge base, and developing analytical thinking skills, while the purpose of medical training would be to master all those tasks relevant to doctors in actual clinical practice. And so the conventional model for medical studies has developed where education naturally occurs in academic university classrooms while training takes place in the hospital wards, with education usually coming first, training after. However, a broader idea of both as well as a deeper consideration of the balance between the two is needed to better fit the needs of making a modern professional doctor.

In my capacity as a medical university teacher, educational activities of both types fall clearly within my purview even though my teaching environment is the university classroom. It is my job to develop curricula, syllabuses, and materials both to teach my own students as well as to integrate with other educators and doctors to produce students with basic knowledge, intellectual curiosity, communication skills and appropriate study skills, as required by the HUSM principles and objectives, upon which they will build their future medical careers. Achieving all this in only the first one and a half years of the students' time at the university, where the English courses are concentrated, is indeed a challenge. Naturally, this knowledge-building phase is well suited to the typical classroom environment, where textbooks, lectures, tutorials, group work, homework, report writing and the internet are excellent educational tools. In addition, my concentration on skills development such as study skills, communication skills, thinking and reasoning skills, research skills, and presentation skills, requires students to be less desk-bound and more interactive to develop the social skills needed for cooperation, coordination and collaboration skills. An important consideration is how to balance these competing needs and keep students positively engaged in their learning processes as they are trained in these new skills.

Nevertheless, the current trend in medical education is away from staid lectures and towards the task-oriented nature of medical training that most often occurs in clinical settings as this will be the future working environment for most doctors. Indeed, as Flexner observed in his visits to medical schools, boring lecture-style education was of little value in medical education, especially when combined with an absence of practical hands-on experience with patients in hospitals; "*An education in medicine,*" wrote Flexner, "*involves both learning and learning how; the student cannot effectively know, unless he knows how.*"⁵ Of course, there are many practical skills that students can be trained for in the classroom; taking

a medical history, interviewing patients, group discussion skills, collaboration, research methodologies and so on. The competencies that result from teaching vocational or practical skills and knowledge in the classroom environment can be carried forward to specific useful skills in the students hospital programs. Thus, there is a lot of overlap between these two distinct areas, so our educational and training missions should be cooperative in nature. And after graduation, it is expected that they will continue their medical education and training as professional development to keep their knowledge and skills up-to-date.

Indeed, no one ever learns all they need to know at school or university. An additional problem that has arisen recently is that the many students' experience of 12 years of education prior to entering medical school in Japan, e.g. "yutori kyoiku" (relaxed education) and emphasis primarily on tests and cramming for tests, is now being discovered to have little prepared freshmen for the academic rigors and intellectual challenges of their six-year medical study programs (O'Dowd, 2006). Indeed, the Japanese Ministry of Education, Culture, Sports, Science and Technology (*Monbukagakusho*) clearly articulates this trouble in their own 2005 White Paper on the state of Japanese education:

"There are challenges with regard to children's Academic Ability, as children are not always sufficiently equipped with the ability to apply knowledge and skills they have learned, such as reading comprehension. In addition, it is especially concerning that Japanese children have a poor desire to learn and have not mastered good learning habits. We must foster Academic Ability for the children to master the basics so that they can learn to educate themselves, think for themselves, and have the ability to solve problems even better." (MECSST, 2005, p.2)¹⁰

Not surprisingly, in a previous study on students' initial expectations of university life (O'Dowd, 2006) I found a clash of lax expectations with the academic demands of the medical university curriculum, making the adjustment period difficult for many. In addition, although students do manage to pass their courses, many students fail to adequately learn or absorb course content or forget what they learn in a relatively short time (i.e. after the examination is over). Students typically do not know how to engage in the types of learning that makes syllabus content a permanent acquisition to their knowledge base. Thus, it is difficult to say that students now are more "educated" in practical terms than in the past as the learning goal posts have moved significantly as medical knowledge is expanding exponentially. These days, graduates who aren't making the effort to keep up with the times are falling behind rapidly as their knowledge and skills atrophy, even making themselves a danger to their patients. It is therefore clear that we are now in an age where lifelong learning is a necessary requirement for all doctors.

Another factor strongly influencing medical education now, not only in Japan but the world over, is the establishment of the Global Minimum Essential Requirements (GMER) in medical education established

by the Core Committee of the Institute for International Medical Education (IIME)¹¹. This committee has developed a set of minimum learning outcomes that should be common to all medical school graduates, with the goal of developing “global physicians” with a common high standard of medical competencies. The four basic competencies required are Clinical Skills, Population Health, Professional Values and Attitudes, and Scientific Foundations. Within these four competencies, three core skills are centered: Communication Skills, Critical Thinking and Information Skills. By placing the focus on medical student outcomes the IIME intends to influence medical school curriculums as well as the educational processes currently in practice:

“In defining the essential competencies that all physicians must have, an increasing emphasis needs to be placed on professionalism, social sciences, health economics and the management of information and the health care system. This must be done in the context of social and cultural characteristics of the different regions of the world. The exact methods and format for teaching may vary from school to school but the competencies required must be the same”¹¹.

The main elements of the GMER can be seen in Appendix 3.

Recent changes in medical education and some implications

Since 1990, Japanese medical education has undergone a number of significant changes. Many medical schools have now implemented integrated curricula, problem-based learning in tutorial settings, and clinical clerkships. In particular, problem-based learning (PBL) is now a very common program in medical education around the globe. However, how PBL is applied in regards to educational methods and innovation may not resemble what PBL should actually be. This is because the implementation of PBL in different educational cultures does not undergo a similar evolutionary process; each implementation is different, each experience is unique, and “success” can be defined in many ways. It is also regrettable that some doctors and students have based their negative opinion of PBL and what it is able to accomplish on their experience or observations of poorly delivered units, unaware of the fact that they were not seeing the true potential problem-based learning has as a more effective learning method.

In 2005, a nationwide common achievement test was instituted that students must pass to qualify for pre-clinical medical education, similar to the United States Medical Licensing Examination (USMLE) Step 1, although the Japanese test is not a licensing examination. The National Examination for Physicians is a 500-item multiple-choice examination that is administered once a year. This test has impacted on the way medical students are studying; rather than studying to build their knowledge base for their future careers, they are merely cramming for the test. Both students and teachers have commented that students narrow concentration on test preparation guides rather than their text books has left them without the basic

knowledge that their teachers in the hospital expect them to have. Nevertheless, in 2006¹², 8,602 applicants sat for the examination and 90.0% passed. It appears many medical students are better at taking tests than learning.

Another new law now requires postgraduate training for two years after graduation with improved conditions for residents. Residents are paid reasonably well (compared to the past), and their work hours are limited to 40 hours a week; although this has reduced the burden on them, it has in fact resulted in a greater burden falling on existing doctors as well as reducing residents exposure to practical experience that they sorely need. Unfortunately, although well-intentioned, not all changes have been for the better; the new matching placement system introduced in 2004 was intended to give graduates more freedom, however, significant problems have resulted as many hospitals in regional areas can't get enough new doctors to fill positions, resulting in critical staffing shortages, department closures, and even hospital closures. It appears the medical system in Japan still faces a number of crisis issues, with no easy solutions on the horizon.

Comments on the current system

In order to better understand the impact of these recent changes to medical education, I undertook an informal survey that included several third-year medical students, doctors who are teaching medical students, and doctors who are training medical students in the hospital. Feedback was limited, with eleven oral replies and three pieces of written feedback. These replies still illuminate some of the problems currently being experienced as well as suggesting what they think should be done to improve the situation for all concerned. The following is a summary of the feedback received.

We need to be able to adjust our medical school admissions based upon realistic projections of doctor needs for small towns, regional areas and specialities like pediatrics.

Training in professional behavior is needed in the hospital.

I think we need to base our curriculum more on the feedback from hospitals and doctors in practice about what needs to be learnt in the universities and training in the hospitals.

Students should be ranked earlier, and streamed for medical education & training to bring below average and poor students up to a decent level in line with the university's objectives.

Doctors are currently burdened with an unsustainable level of teaching, administration and hospital workloads.

There is too much emphasis on research (and winning grants and funding), and not enough emphasis on education & training.

About the performance of current students, some are good, some are acceptable (as I was), and some

are terrible as medical students. I feel awful to think of them as becoming a doctor in the future. Indeed, you can see some “MONSTER trainee” in this hospital. Selfish, ill-mannered, dirty, poor hand and poor knowledge, and wasting university money. They are not refined as an adult much less as a clinician.

PBL? Most of the students do not think the problems are realistic, and neither do some tutors. Reality and seriousness are lacking.

Before allowing students to be put in front of patients, basic medical knowledge is necessary, of course. Better screening out of students who lack this basic knowledge is required. Their knowledge should not only be focused to pass exams. Useless knowledge is nothing in front of a patient. Motivation may not be a skill but it is an essential component.

Reality, motivation, practicality and a tough standard; these may be more desired in our curriculum.

Role play and lectures by upper-class students could be helpful.

The current situation in medical education is not good. Too many teachers are lukewarm in teaching; and the students are lukewarm about learning!

The evaluation system for teachers and for students isn't working. How did some of these students pass their courses and enter the hospital??

Teachers need to sift out the poor students earlier. Poor students passing classes sets a bad example for other students and lowers their motivation. Then the standard falls lower too.

The curriculum should re-emphasize the prime role of preparation of doctors who will serve in the community.

Too many multiple-choice question tests. It would be better to have students show what they know and understand by writing short answers or essays as well as giving oral responses.

Students need to read more books, not just test preparation guides.

As can be surmised by these comments, a considerable degree of frustration exists in the current medical education and training system. Some of the recurring themes from doctor teachers were the lack of student preparedness and motivation, poor knowledge base due to inadequate study habits, and a need to change the curriculum to better reflect real world needs although some do not see the value in some of the recent changes in medical education made at HUSM. In addition, some doctors commented that they did not see current students as being as serious or motivated as they themselves were at the same time in their training. Students expressed disappointment in some of the courses they were required to take, citing lack of perceived relevance, boring classes, sub-par teaching, lack of structure, time wasting, and incomprehensible evaluations. Nevertheless, every doctor and student interviewed had some constructive comments to make about how to improve the medical education system here.

Innovations for evolution

Giving due consideration to the opinions expressed above, I would like to outline some possible innovations that could positively promote the evolution of our medical education system and hopefully graduate better medical practitioners. Firstly, with regards to the objectives of HUSM, (1) update and expand the objectives to promote a more focused vision for the university and its students and graduates, (2) create a greater awareness of these objectives amongst the teachers and students so these become more significant in both education and training, (3) have teachers consider how to promote these objectives in the course syllabuses and programs they develop, and (4) implement some checkpoints or methods for determining success in attaining these objectives.

Secondly, more emphasis should be placed on students taking responsibility for their own learning and performance (or lack of) and quality control. Ideally, medical universities should continually monitor both their inputs and outputs of the education and training provided. This would require a more intense scrutiny of individual students in order to help any under-performing students to get back on track; early exit mechanisms should be put in place to deal with students who are found to be unsuitable to continue in the university program.

Thirdly, a range of assessment methods should be employed that promote the building of the students knowledge base, encourage students to develop their own learning skills and abilities, enable assessors to better determine what students actually know and understand, provide fairness to all students, and that show how the objectives of the university are being met.

Fourthly, the heavy workload of many of the doctors means less efficient education, training and evaluations, e.g. juggling classes, PBL tutorials and meetings with their hospital duties, patient loads and research. In addition, many doctors are not trained as professional teachers and are subsequently limited in their approaches to education and classroom instruction; greater recognition and support should be provided to doctor-teachers which in turn would provide better support for the students and their academic success.

Finally, that all implemented innovations are monitored closely to ensure that they are on track to achieve what they are meant to achieve. Changes to a program can often raise unforeseen problems that dilute effectiveness, derail intentions and seriously impact on student performance. Mechanisms therefore need to be put in place so timely feedback is provided that allow adjustments or modifications to be made as efficiently and effectively as possible. Indeed, change is a constant element in the educational equation

and it is how administrators and teachers manage change that determines whether it is positive or detrimental to the outcomes desired.

Conclusion

The critical question still facing medical educators and institutions today, as it has done in the past, is what is the best way to make a good doctor. Many changes have occurred in the long history of medical education and training, and more changes are taking place or are being considered at this very time. But although medical universities continually turn out a wide variety of good, poor and bad doctors, this does not mean that the goal of making students into good doctors is unattainable. This paper has endeavored to explore some of the elements in play in the ongoing debate about where medical institutions like HUSM should go from here. My starting point was looking at the vast array of qualities that good doctors are thought to possess and then looking at the objectives of medical universities whose quest it is to produce such individuals. I also looked at the past history of medical education before looking at the changes that are currently taking place and the direction these changes are leading towards. Finally, I listened to the voices of doctors and students already in the midst of these changes and looked for innovations that could help our medical education and training system become more focuses on its primary tasks as well as promoting its evolution. Achieving the goals and objectives of medical universities requires that they continually take a critical view of both medical education and training and the balance of both. For only when doctors are well educated and trained can they uphold the high ideals and standards that society expects of them.

Notes

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Appendix 1

Hamamatsu University School of Medicine (HUSM)⁶

Philosophy and objectives of HUSM at its establishment:

The university seeks to achieve three chief objectives; firstly, to grow up excellent clinicians and highly creative researchers; secondly, to promote original researches and the innovation of medical techniques; and thirdly, to play a leading role in local medical treatments by practicing medicine for the greatest benefits of patients. These goals should contribute to the health and welfare of all mankind.

Mission Statement:

The main task of Hamamatsu University School of Medicine is to actively promote the mankind's health, happiness and prosperity through its educational and academic activities. The school, which serves as an educational and research institution for medicine and nursing, aims at teaching and researches on the newest theories and practical applications of them. The school continuously seeks to grow up expert clinicians and nurses and their researchers who are not only highly academic and skilled but also well trained and versed in medical ethics. By doing so, the university plays a leading role in local medicine and health care and helps them develop.

Educational objectives for students of the Medical Faculty:

- 1. to acquire essential knowledge and skills of medicine to solve problems.*
- 2. to learn how to accurately evaluate oneself and how to continue to educate oneself independently.*
- 3. to create a desire for scientific exploration that is essential for those engaged in medicine.*
- 4. to cultivate themselves in ways that enable them to take an active part in the international arena.*
- 5. to learn to be humane and sincere doctors.*

Educational objectives for Graduate students of the Doctoral Program in Medicine:

- 1. to gain the ability to carry out research based on highly professional knowledge and skills.*
- 2. to develop their ability to write well organized and eloquent theses.*
- 3. to make efforts to explore and discover a mystery of humans by approaching it from their individual and unique perspectives, thereby learning by themselves to pursue lifelong academic achievement.*
- 4. to build personality composed of severity and sincerity being appropriate to a scientist.*
- 5. to utilize their international perspective, thereby sharpening the intelligence and cultivating themselves.*

Appendix 2

University of Queensland School of Medicine - Objectives

<http://www.som.uq.edu.au/som/about/mission.htm>

At our School the broad aim of medical education to produce competent, caring, scientific doctors who are life long self directed learners, continues as the focus, but with emphasis on the ongoing challenge to anticipate and respond to the increasing pace of change in:

Community needs and attitudes,

Medical science and technology, and

The need to provide sustainable health care of the highest standard.

The enthusiasm and dedication of UQ medical educators and practitioners keeps the School at the forefront of worldwide trends in medical education and research, with ongoing evaluation of educational programs and an emphasis on critical appraisal and current best practice. Historically, the medical school dates back to 1936 when it was founded. Incorporated within the Faculty of Health Science it provides the majority of medical training places in the State of Queensland.

Vision: The University of Queensland School of Medicine aims to maintain its ranking as the top medical school in Queensland, to be among the top 3 in Australia, and among the top 20 in the world within the next 5 years.

Mission: The University of Queensland School of Medicine works in partnership with the health system to provide world class accredited medical education, underpinned by lifelong learning skills, our leading researchers, and our contribution to innovative best practice in clinical services. We do this for the benefit of all members of our community in Queensland, Australia, and the world.

The Bachelor of Medicine/Bachelor of Surgery (MBBS) Program

The University of Queensland (UQ) conducts a four year graduate entry medical program, the Bachelor of Medicine/Bachelor of Surgery (MBBS). Designed to produce doctors able to meet the challenges of the new century, the curriculum has been planned to capture the enthusiasm and maturity of its graduate entrants and help them develop into highly skilled medical graduates capable of entering the wide variety of career options open to them.

Key features of the program are:

The simultaneous learning of basic, clinical, biological and social sciences,

The improved teaching of communication skills,

The use of learning approaches that encourage lifelong learning skills,
The incorporation of ethics and professional development as an integral part of the program, and
The incorporation of modern information technology and computing skills to ensure that graduates are able to utilise the advances in technology to improve their learning skill and knowledge acquisition.

Graduates of the School of Medicine Fulfill the Community's Requirements for Competent and Professional Practitioners

Implementation: Students are selected, educated and assessed according to:

A model of clinical reasoning consisting of the ability to integrate knowledge, skills and attitudes from the four domains of learning in the MBBS program, which are:

Clinical Sciences

Biomedical Sciences

Population Health and

Ethics and Professional Practice

The needs of Queensland's urban, rural, remote and indigenous communities.

The University of Queensland's commitment to graduate attributes and

The community's, the School's and the medical profession's requirements for personal and professional attributes.

Graduating students must satisfy the School's academic standards and be prepared to commit themselves to lifelong education.

Graduating students must demonstrate that they can practice safely and are clinically and professionally fit to practice at intern level.

The MBBS Program's Curriculum Emphasises the Factors Required to Equip Graduates to be Responsive to the Changing Health Needs of the Community

Implementation: Community representatives participate in admissions committee meetings.

Students from a range of backgrounds, including rural and indigenous communities, are encouraged and supported in seeking admission to the program.

Instruction in the sciences and clinical practice is informed by the principles of evidence-based medicine.

The curriculum accurately reflects the burden of disease affecting the communities served by the School and its graduates.

The domain structure of the course links clinical practice to its social, legal and political contexts.

Students develop the capacity of critical self-awareness, which enables them to constructively respond to their own personal and health problems, and learning needs.

Students, the medical profession, Queensland Health, allied health practitioners, community groups, and other individual and institutional stakeholders participate in curriculum development, review and delivery.

The School Serves the Community through Education, Research, Provision of Clinical Services and Specific Links with the Wider University, the Medical Profession and the Public

Implementation: The School prepares competent graduates who enter the medical profession and provide health services to the Queensland, Australian and international communities.

The MBBS program provides learning opportunities for students and familiarity with health service delivery through partnerships with individual health practitioners and private and public health institutions.

The School supports the medical profession and the health of the community by providing postgraduate degree courses and training, and through continuing medical education.

Members of the School serve the university through participation on and leadership of faculty and university committees.

Members of the School serve the Queensland community by providing high quality clinical services through a variety of the state's health institutions.

Members of the School serve the community through participation in government and non-government committees, consultancy and secondments.

The School Encourages and Supports its Staff in their Participation in Relevant and High Quality Clinical, Scientific and Educational Research

Implementation: The School offers opportunities for staff members to engage in important research projects to extend the knowledge base concerning health and disease, and to disseminate the results through national and international peer-reviewed journals.

Clinical academics inform their teaching in the MBBS program and postgraduate courses with the results of their research.

Clinical and scientific research undertaken within the School reflects the burden of disease affecting the communities served by the School and its graduates.

Clinical and scientific research undertaken within the School is subject to peer and community review and monitoring, through the University's Human Research Ethics Committee system, in accordance with the NHMRC's National Statement on Ethical Conduct in Research Involving Humans (1999).

Research into educational methods is conducted within the MBBS program, with publication of the results in national and international journals.

The School Encourages and Provides a Collegial and Supportive Culture for Staff and Students

Implementation: The School values the contributions made by its staff to the implementation of the MBBS program in the areas of curriculum design and delivery, assessment, teaching and learning development, pastoral care, and evaluation.

Students are active members of School committees.

Students are regularly involved in the evaluation of curriculum content, structure and delivery, and assessment.

Senior students provide pastoral care for junior students, and new graduates participate in tutorial teaching in year two of the course.

The School provides a suite of support and pastoral care processes, with particular attention to the specific needs of indigenous and international students and students with special needs.

The School Regularly Evaluates, and Invites External Evaluation of its Educational, Research and Service Activities

Implementation: The School provides detailed and timely reports to the Australian Medical Council, which accredits Australasian medical programs.

The School undertakes outcomes evaluation of the MBBS program.

Annual curriculum conferences critically review curriculum, teaching and assessment policies and processes.

National and international medical education authorities regularly participate in Curriculum. Conferences and workshops, and provide critical appraisal and advice on the program.

The School attracts medical and related research grants at a high rate.

Appendix 3

Global minimum essential requirements in medical education

Source: <http://www.iime.org/documents/gmer.htm>

The Core Committee of the Institute for International Medical Education has grouped the 'essentials' under following seven, broad educational outcome-competence domains:

Professional Values, Attitudes, Behavior and Ethics

Professionalism and ethical behavior are essential to the practice of medicine. Professionalism includes not only medical knowledge and skills but also the commitment to a set of shared values, the autonomy to set and enforce these values, and responsibilities to uphold them. The medical graduate must demonstrate:

- recognition of the essential elements of the medical profession, including moral and ethical principles and legal responsibilities underlying the profession;
- professional values which include excellence, altruism, responsibility, compassion, empathy, accountability, honesty and integrity, and a commitment to scientific methods,
- an understanding that each physician has an obligation to promote, protect, and enhance these elements for the benefit of patients, the profession and society at large;
- recognition that good medical practice depends on mutual understanding and relationship between the doctor, the patient and the family with respect for patient's welfare, cultural diversity, beliefs and autonomy;
- an ability to apply the principles of moral reasoning and decision-making to conflicts within and between ethical, legal and professional issues including those raised by economic constraints, commercialization of health care, and scientific advances;
- self-regulation and a recognition of the need for continuous self-improvement with an awareness of personal limitations including limitations of one's medical knowledge;
- respect for colleagues and other health care professionals and the ability to foster a positive collabora-

tive relationship with them;

- recognition of the moral obligation to provide end-of-life care, including palliation of symptoms;
- recognition of ethical and medical issues in patient documentation, plagiarism, confidentiality and ownership of intellectual property;
- ability to effectively plan and efficiently manage one's own time and activities to cope with uncertainty, and the ability to adapt to change;
- personal responsibility for the care of individual patients.

Scientific Foundation of Medicine

The graduate must possess the knowledge required for the solid scientific foundation of medicine and be able to apply this knowledge to solve medical problems. The graduate must understand the principles underlying medical decisions and actions, and be able to adapt to change with time and the context of his/her practice. In order to achieve these outcomes, the graduate must demonstrate a knowledge and understanding of:

- the normal structure and function of the body as a complex of adaptive biological system;
- abnormalities in body structure and function which occur in diseases;
- the normal and abnormal human behavior;
- important determinants and risk factors of health and illnesses and of interaction between man and his physical and social environment;
- the molecular, cellular, biochemical and physiological mechanisms that maintain the body's homeostasis;
- the human life cycle and effects of growth, development and aging upon the individual, family and community;

- the etiology and natural history of acute illnesses and chronic diseases;
- epidemiology, health economics and health management;
- the principles of drug action and its use, and efficacy of various therapies;
- relevant biochemical, pharmacological, surgical, psychological, social and other interventions in acute and chronic illness, in rehabilitation, and end-of-life care.

Communication skills

The physician should create an environment in which mutual learning occurs with and among patients, their relatives, members of the healthcare team and colleagues, and the public through effective communication. To increase the likelihood of more appropriate medical decision making and patient satisfaction, the graduates must be able to:

- listen attentively to elicit and synthesize relevant information about all problems and understanding of their content;
- apply communication skills to facilitate understanding with patients and their families and to enable them to undertake decisions as equal partners;
- communicate effectively with colleagues, faculty, the community, other sectors and the media;
- interact with other professionals involved in patient care through effective teamwork;
- demonstrate basic skills and positive attitudes towards teaching others;
- demonstrate sensitivity to cultural and personal factors that improve interactions with patients and the community;
- communicate effectively both orally and in writing;
- create and maintain good medical records;

- synthesize and present information appropriate to the needs of the audience, and discuss achievable and acceptable plans of action that address issues of priority to the individual and community.

Clinical Skills

The graduates must diagnose and manage the care of patients in an effective and efficient way. In order to do so, he/she must be able to:

- take an appropriate history including social issues such as occupational health;
- perform a physical and mental status examination;
- apply basic diagnostic and technical procedures, to analyze and interpret findings, and to define the nature of a problem;
- perform appropriate diagnostic and therapeutic strategies with the focus on life-saving procedures and applying principles of best evidence medicine;
- exercise clinical judgment to establish diagnoses and therapies;
- recognize immediate life-threatening conditions;
- manage common medical emergencies;
- manage patients in an effective, efficient and ethical manner including health promotion and disease prevention;
- evaluate health problems and advise patients taking into account physical, psychological, social and cultural factors;
- understand the appropriate utilization of human resources, diagnostic interventions, therapeutic modalities and health care facilities.

Population Health and Health Systems

Medical graduates should understand their role in protecting and promoting the health of a whole

population and be able to take appropriate action. They should understand the principles of health systems organization and their economic and legislative foundations. They should also have a basic understanding of the efficient and effective management of the health care system. The graduates should be able to demonstrate:

- knowledge of important life-style, genetic, demographic, environmental, social, economic, psychological, and cultural determinants of health and illness of a population as a whole;
- knowledge of their role and ability to take appropriate action in disease, injury and accident prevention and protecting, maintaining and promoting the health of individuals, families and community;
- knowledge of international health status, of global trends in morbidity and mortality of chronic diseases of social significance, the impact of migration, trade, and environmental factors on health and the role of international health organizations;
- acceptance of the roles and responsibilities of other health and health related personnel in providing health care to individuals, populations and communities;
- an understanding of the need for collective responsibility for health promoting interventions which requires partnerships with the population served, and a multidisciplinary approach including the health care professions as well as intersectoral collaboration;
- an understanding of the basics of health systems including policies, organization, financing, cost-containment measures of rising health care costs, and principles of effective management of health care delivery;
- an understanding of the mechanisms that determine equity in access to health care, effectiveness, and quality of care;
- use of national, regional and local surveillance data as well as demography and epidemiology in health decisions;
- a willingness to accept leadership when needed and as appropriate in health issues.

Management of Information

The practice of medicine and management of a health system depends on the effective flow of knowledge and information. Advances in computing and communication technology have resulted in powerful tools for education and for information analysis and management. Therefore, graduates have to understand the capabilities and limitations of information technology and the management of knowledge, and be able to use it for medical problem solving and decision-making. The graduate should be able to:

- search, collect, organize and interpret health and biomedical information from different databases and

sources;

- retrieve patient-specific information from a clinical data system;
- use information and communication technology to assist in diagnostic, therapeutic and preventive measures, and for surveillance and monitoring health status;
- understand the application and limitations of information technology;
- maintain records of his/her practice for analysis and improvement.

Critical thinking and research

The ability to critically evaluate existing knowledge, technology and information is necessary for solving problems, since physicians must continually acquire new scientific information and new skills if they are to remain competent. Good medical practice requires the ability to think scientifically and use scientific methods. The medical graduate should therefore be able to:

- demonstrate a critical approach, constructive skepticism, creativity and a research-oriented attitude in professional activities;
- understand the power and limitations of the scientific thinking based on information obtained from different sources in establishing the causation, treatment and prevention of disease;
- use personal judgments for analytical and critical problem solving and seek out information rather than to wait for it to be given;
- identify, formulate and solve patients' problems using scientific thinking and based on obtained and correlated information from different sources;
- understand the roles of complexity, uncertainty and probability in decisions in medical practice;
- formulate hypotheses, collect and critically evaluate data, for the solution of problems.