



Learning for the Future: The IMU Experiment

Editors - P.K.C. Lim and J.W. Mak







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IMU Vision

IMU shall be an innovative global centre of excellence in learning and research, supporting a community of scholars and professionals committed to serving society, promoting the development of students to reach their true potential in becoming competent, ethical, caring and inquiring citizens and visionary leaders.

IMU is committed to academic freedom and the principles of equal opportunity in the pursuit and application of knowledge, the highest standards of intellectual, educational and research productivity; and the establishment of a learning organisation that respects the individual.





The

3

I'S OF IMU

Innovation
Imagination
Insight

Preface

The story of the development of the International Medical University (IMU) has been published in “The IMU Journey”, “Learning for Life - The Story of the International Medical University Malaysia 2012” and “International Medical University - 10th Anniversary MBBS (IMU) and The Clinical School” to commemorate the 20th anniversary of IMU and the 10th Anniversary of the Clinical School and the MBBS programme respectively. IMU’s progress is illustrated in Appendices (1) to (5).

This publication is all about consolidating the growth, and working towards realising the vision of IMU. We have a long way to go, however the leadership and staff members of IMU have accepted the vision and will work together to realise it.

In this process, one of the activities involved teams of staff members working together to discuss, disseminate and document specific topics that had been identified. These topics form the basis for this publication which will consist of three sections. Basically the topics centre on the important values and issues that need to be considered to enable us to work towards realising our vision.

The vision is clear on the need for IMU to achieve excellence and be a leader at national, regional and international levels. It is also clear that our graduates must serve and be caring, ethical and capable of exercising leadership in their respective communities. The vision also clearly states the liberal attitude to be taken to ensure academic staff can excel and to develop a learning organisation at IMU. The vision is broad, ambitious and emphasises the need for innovation and the importance of embracing change.



The various topics in the three sections are important and should be considered together to work to realise the IMU vision. This publication is also to document a “reference” point in our thinking at this particular point of time and is also relevant in working towards creating a learning organisation.

The various chapters in the three sections are the work of working groups and while some attempts at editing had been done, it is nowhere near what should probably be done. Nonetheless it does reflect the views of the different working groups. The content tends to be somewhat “lengthy” and overlap considerably between chapters, but has been tolerated to allow the degree of “autonomy” of the different working groups to achieve their respective objectives.

The various topics in the three sections really are to ensure that the “conversation” can continue and will always be “works in progress”. The eight principles of higher education, the attributes of IMU graduates, the IMU Learning Model and the outcome-based curriculum relate to our educational philosophy and how we work to achieve these aspects of our vision relating to teaching and learning.

The chapters on scholarship and the roles of the Professor and Professoriate are to push the conversation on these topics in the light of the challenges of a rapidly changing world. Boyer’s four part paradigm of scholarship is very important and useful in considering the contributions of academics and managing the interface between scholars and the rest of the world.

The role of the University is changing and hence the roles of the professor and the professoriate need to be discussed. How much autonomy can there be for academics to function effectively and the role of the professoriate in academia and outside it, needs to be further discussed.

The consideration of the various topics really helps us to understand better the values that are embedded in the IMU vision. Too often these values have not been considered and discussed sufficiently, as what has been considered as “values” have merely been the obvious and superficial. I had identified the various topics based on the issues and concerns that had arisen in different ways over the last decade at IMU. There will be other issues that will need consideration and this can surely be done. It is important however to go back to the vision when we consider the priorities that are relevant in our rapidly changing environment.

In working to realise our vision, IMU needs to work to be “values-led” and “purpose-driven”. While we are going in that direction, a lot more needs to be done. This publication will help to push the conversation in that direction and continue to galvanise our action towards achieving our vision, which includes the development of a learning organisation.

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3. *International Medical University. (10th Anniversary MBBS (IMU) and The Clinical School 1999 - 2009)*.
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“Learning for the Future - The IMU Experiment” will continue to grow with the partnerships with universities around the world. What we do at IMU can be useful to others and we can share this experience with them ... our challenge is to live our vision.

Tan Sri Dato’ Dr Abu Bakar Suleiman

President

International Medical University



Appendix 1

Programmes in IMU – 2015

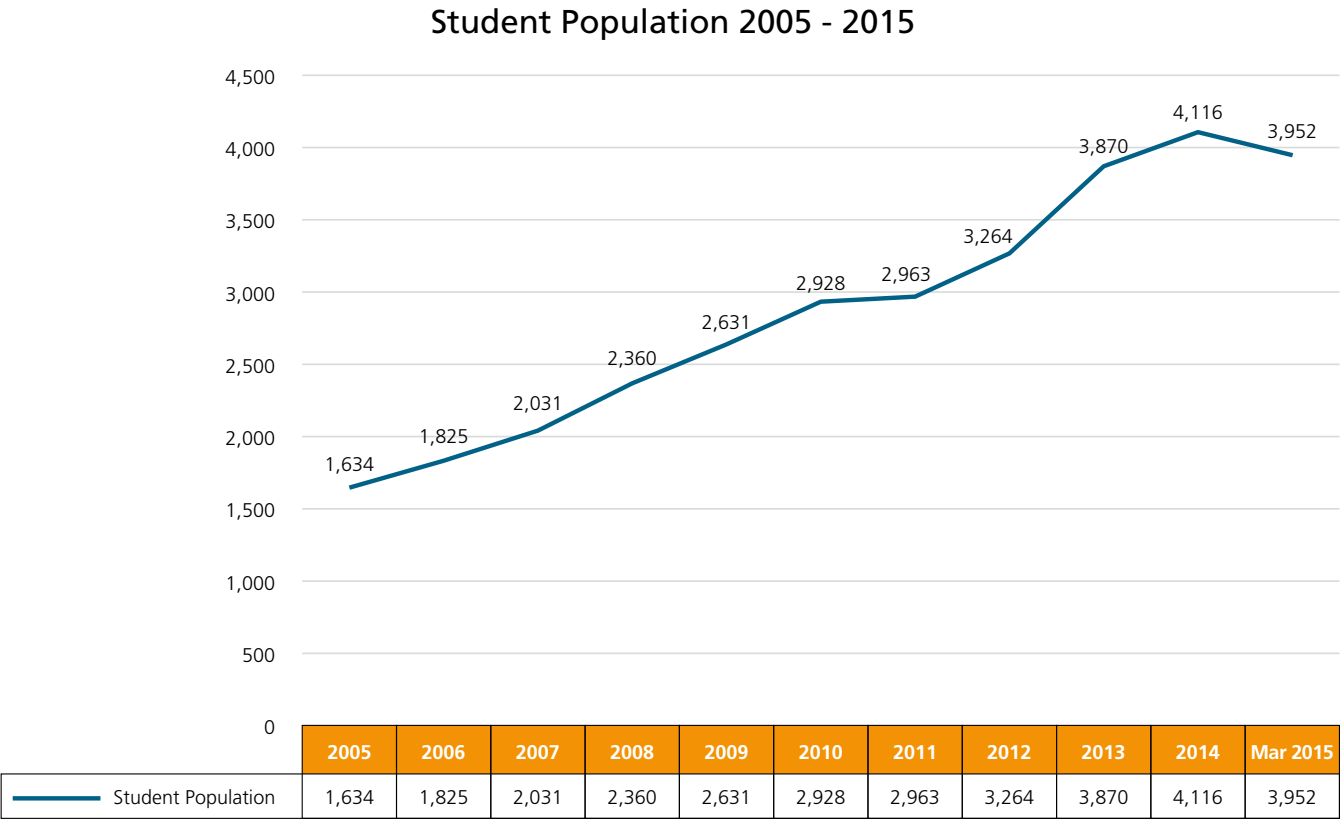
IMU PROGRAMMES IN 2015	
1.	Bachelor of Medicine and Bachelor of Surgery (MBBS)
2.	Bachelor of Medical Sciences (Hons)
3.	Bachelor of Dental Surgery
4.	Bachelor of Pharmacy (Hons)
5.	Bachelor of Science (Hons) Pharmaceutical Chemistry
6.	Bachelor of Nursing (Hons)
7.	Bachelor of Science (Hons) Dietetics with Nutrition
8.	Bachelor of Science (Hons) Nutrition
9.	Bachelor of Science (Hons) Biomedical Science
10.	Bachelor of Science (Hons) Medical Biotechnology
11.	Bachelor of Science (Hons) Psychology
12.	Bachelor of Science (Hons) Chiropractic
13.	Bachelor of Science (Hons) Chinese Medicine
14.	Bachelor of Science (Hons) Psychology
15.	Bachelor of Nursing Science (Hons) Post Registration
16.	Foundation in Science
17.	Master of Science in Public Health
18.	Master of Science in Analytical and Pharmaceutical Chemistry
19.	Master of Science in Molecular Medicine
20.	PhD in Medical and Health Sciences (By Research)
21.	Master of Science in Environmental Health
22.	Master of Science in Medical and Health Sciences (By Research)
23.	Post Basic Certificate in Teaching Methodology for Nurses

Appendix 2

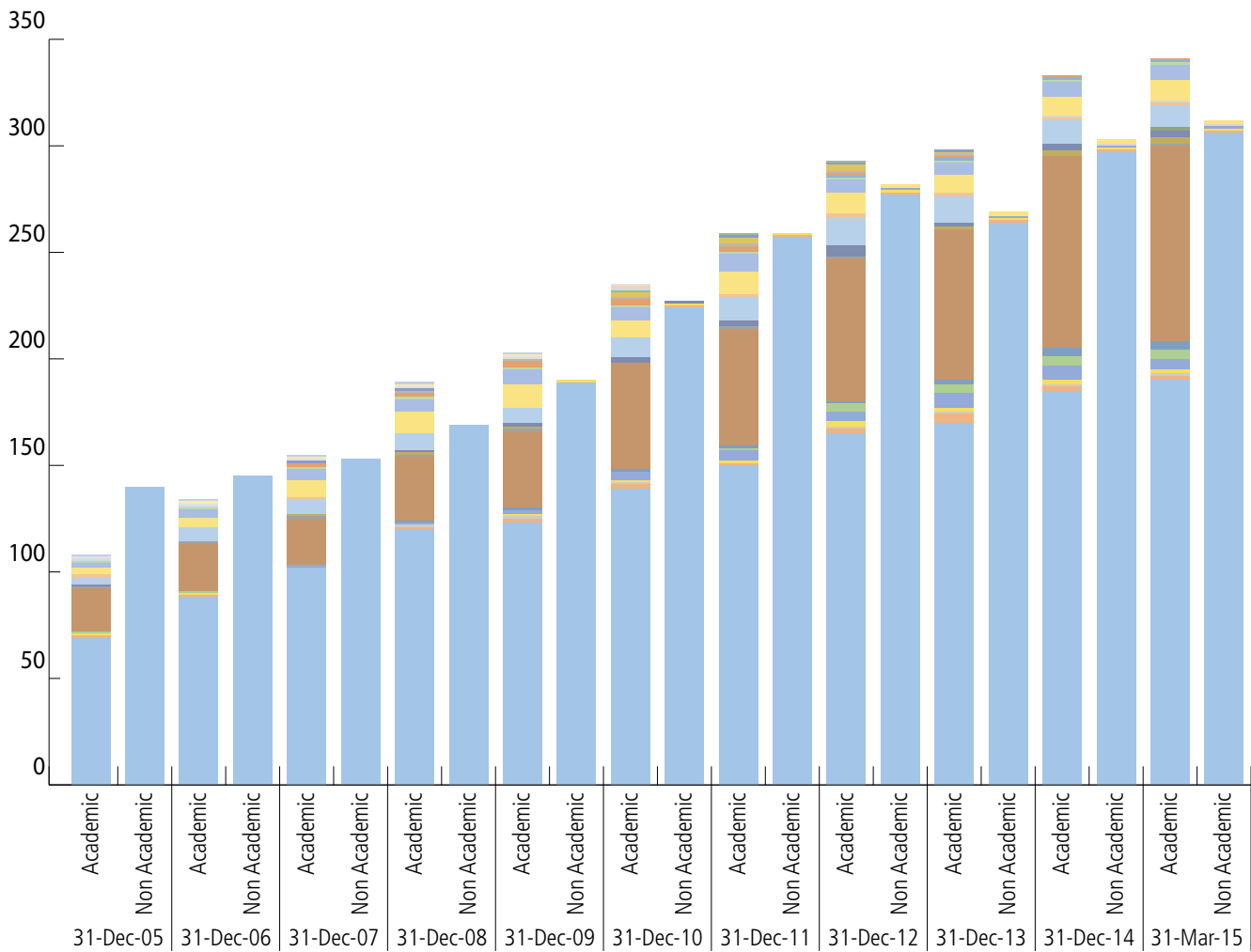
Student Population in IMU from 2005 - 2015

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The IMU Experiment



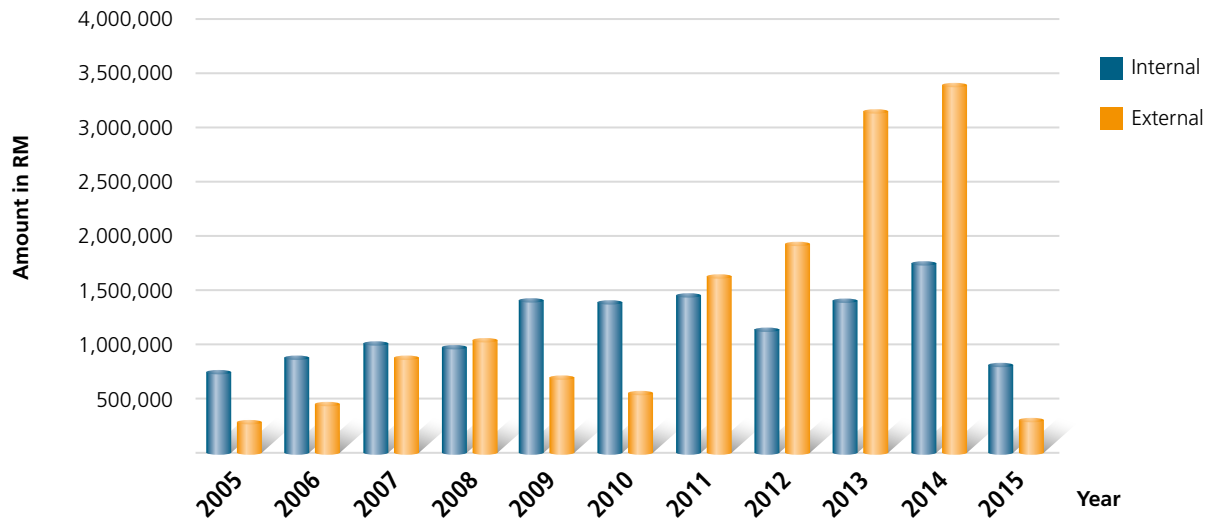
IMU Staff Strength (2005 - 2015)



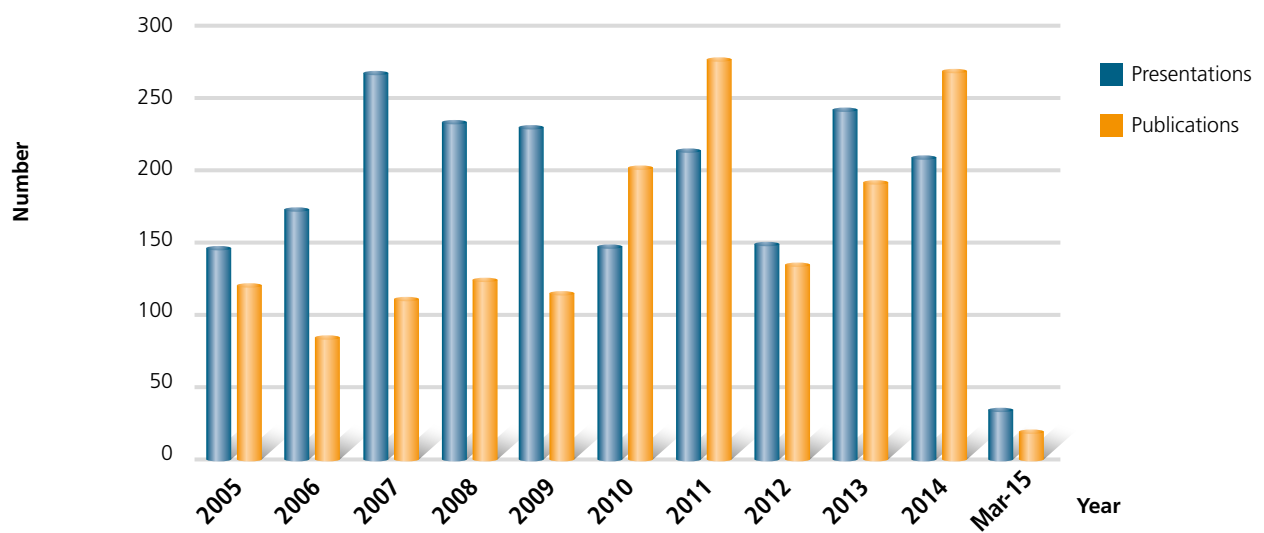
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|-----------|-------------|------------|----------------|--------------|--------|
| Malaysia | Australia | Bangladesh | United Kingdom | America | Canada |
| Egypt | India | Indonesia | Iran | Iraq | Korea |
| Myanmar | New Zealand | Norway | Pakistan | Sri Lanka | Taiwan |
| Yemen | Zimbabwe | Senegal | China | South Africa | Japan |
| Singapore | Denmark | Nigeria | Spain | Cameroon | |

Appendix 3

IMU Research Funding (2005 - 2015)



IMU Presentations and Publications (2005 - 2015)



Appendix 4

Award for Community Service Presented by Talloires Network and MacJannet Foundation (Prize for Global Citizenship)

The MacJannet Prize was established by the Talloires Network and the MacJannet Foundation to recognise exceptional student community engagement initiatives at Talloires Network member universities and contributes financially to their ongoing public service efforts. The MacJannet Prize was established in order to:

- Recognise and encourage exceptional student community engagement and community service
- Financially support the ongoing work of university-based civic initiatives
- Elevate innovative civic engagement programme models and disseminate them throughout the Network as examples of promising practices
- Strengthen public support for the global civic engagement movement in higher education
- Champion the values and extend the legacy of Donald and Charlotte MacJannet, who devoted their lives to fostering international understanding
- Promote action around the principles of the Talloires Declaration, which recommends steps to elevate the civic engagement of universities around the world

The IMU-Cares Kg Tekir Project was declared the winner in 2013, beating 61 other universities from around the world. The project was considered exceptional by the Talloires Network and the MacJannet Foundation because it fulfils most, if not all of the criteria for the MacJannet Prize.



Appendix 3

Association for Medical Education Europe (AMEE) Award for Student Engagement



The ASPIRE to Excellence Programme has been established to go beyond the traditional accreditation process and to recognise that the education programme in a medical school can be subjected to peer review against an agreed set of standards or benchmarks that identify world-class excellence in education.

Areas of Excellence

Three spheres have been selected for assessment.

- Assessment of students
- Student engagement in the curriculum and in the medical school
- Social responsibility and accountability as a mission of a medical school

The IMU was a winner of the 2013 Awards for student engagement.

Appendix 4

Acknowledgements

We are indebted to Tan Sri Dato' Dr Abu Bakar Suleiman, President of IMU, for initiating the idea of publishing this book in an effort to better understand the values embedded in IMU's vision. Our special appreciation to Dr Mei Ling Young, Professor Victor Lim, Professor Aziz Baba, Professor Peter Pook, Professor Mak Joon Wah and Ms Christy Chiu for their continuous support, understanding and encouragement during the preparation of this book. Our special thanks to all the authors and reviewers who have worked endlessly on the book chapters and to the school administrators for their coordination of the various working groups. We are grateful to the Marketing Department and Ms Ida Fazlina for their assistance in the design, layout and printing of this book. We would also like to thank all others who have in one way or another contributed to this book.





23 years ago, three Malaysian academicians namely Kamal Salih, Mei Ling Young and the late Saidi Hashim together with the help of two internationally renowned medical educationists, Ron Harden and Ian Hart started the first private medical college in Malaysia, the International Medical College (IMC). It was however more than just another medical college, it was an experiment in the internationalisation of medical education. Based on the underlying principle that there is sufficient commonalities in medical education, it was hypothesised that a medical student trained in one part of the world will be able to seamlessly transfer to a medical school in another part of the globe and successfully complete the entire medical programme. Thus, work started on a unique model of international partnership in the training of doctors. The reputations of Ron Harden and Ian Hart helped lend credibility to the IMC project. Through their personal links with schools in the United Kingdom and Ireland, 5 medical schools joined the original consortium namely Dundee, the Royal College of Surgeons of Ireland, Liverpool, Aberdeen and Glasgow. Under this arrangement, medical students were recruited in Malaysia to undergo a 5-semester Phase 1 programmes in IMC using a common curriculum. Upon successful completion of the Phase I course, the students will transfer to an overseas Partner Medical School and complete the medical programme.

23 years on, IMU is a full-fledged tertiary institution offering some 20 health professional programmes at pre-university, undergraduate and postgraduate levels. Students can complete these programmes entirely in Malaysia or opt for a credit transfer arrangement modelled after the original medical programme. IMU has credit-transfer agreements

Introduction

with nearly 40 partner universities around the world. Even though 23 years is a very short duration of time in a university's life cycle, IMU can look back with some sense of pride and satisfaction at the progress it had made over the last 23 years. This series of booklets is an attempt at a situational analysis of what we are, what we do, where we are now and importantly where we want to be. Many members of faculty have contributed to the chapters which are also partly reflections of how true we have or have not been to our vision, mission, philosophy and values which were articulated at the time of the establishment of the institution.

The original experiment had been a very bold, even audacious venture. Not everyone involved in the early years were confident of its success. Professor Ian Simpson, formerly the Clinical Dean of the Medical School at the University of Auckland (one of the five original partner schools) said, "In the early days, I was not sure that the IMU would be a viable project." He remembered that when he first came to Kuala Lumpur, he found a lack of high quality infrastructure at private institutions and this added to his doubts. He recalled that a particular professor from Australia was particularly vociferous in his criticism of the proposed IMC programme with partner schools. He wanted the students to come to the partner schools first and then complete clinical training in Malaysia with a Malaysian degree. It was also clear that the public university medical schools and their leadership in Malaysia were rather antagonistic to a private school which might threaten their status and access to resources. Like most medical schools anywhere they preferred a closed shop even if it meant inadequate numbers in the medical workforce. Their alumni

often felt the same about a private medical school saying “that the standard of medical graduates in Malaysia would fall”.

Professor Ian Simpson became more confident with time when he got to know the people at IMC better and began to realise that they had the energy, enthusiasm, political connections and business plan to make it work. Moreover, the students, while mostly not from the 90+ percentile of school leavers, were very motivated (their parents’ monies were at stake) and most could be successful in a medical programme. He attributes the success of IMU to the leadership of Mei Ling who provided constant energy and drive and effectively made use of everything and everybody necessary for the success of the school. Much of the guidance with the first group of partners came from the senior deans and caucus representatives as they were able to advise mainly on which medical school to approach, how to go about it, and what we need to do in IMC to give them confidence.

Thus, the partner schools, Academic Council and Professional Education Advisory Committee (PEAC) (formerly the International Consultative Committee) where Professor Michael Hamlin, Dr Joseph Gonnella, Professor Michael Orme and Dr John Ruedy played critical roles, had facilitated the rapid development of the IMU and the educational professionalism.

The experience and quiet advice of Tan Sri Dato’ Dr Abu Bakar Suleiman were very valuable for the Malaysian scenario, especially how to work with the Seremban Hospital staff, the building of the Clinical School on the

grounds of the hospital, and other important considerations for a private-public partnership which had no precedence.

Professor Michael Orme, the former Dean of Medicine in Liverpool University remembers quite vividly the summer of 1991, when Sir Robert Shields (a previous Dean of Medicine in Liverpool) brought two visitors from Malaysia to see him. Those visitors were Mei Ling Young and Kamal Salih who he got to know very well in succeeding years. After a preliminary visit to Kuala Lumpur, the University of Liverpool became one of the first universities to join the IMC in April 1992. Michael did not have any worries about the IMC being a viable project because the enthusiasm of all involved overcame any concerns about the project. He did however have some concerns over where the project would be based. He still remembers clearly being taken on a visit to a potential site located along the North South highway with a chicken farm near Rawang. Kamal dreamt of a bridge over the highway called “Gerbang Ayu” on the slope of the hill heading north on the highway, it had a view of the spreading township of the “new” Rawang. In retrospect, Michael felt that it would have been a very difficult site to manage and the final arrangements at Bukit Jalil are clearly much better.

John Marley first came to the IMU with Derek Frewin, Dean of Adelaide. John convinced Derek Frewin to join the IMU. He was then the Dean of Students. After that, John moved to Newcastle as its Vice Chancellor of the Faculty of Health Sciences. Then he moved to University of Queensland as Professor. Professor Marley, from the very start, had no doubt that IMU was a viable project. He was impressed with the founders who saw that to help make access to

medical education more equitable, a model that allowed students to be in their home country for longer was both more economical and enabled them to be older and more mature at the point of transfer to a different medical school in a different country with a very different culture. John added that the IMU model has been copied by many universities in different parts of the world and he had no doubt that there was a market for the idea. By the time he was associated with IMU the challenging task of recruiting partner medical schools had been achieved successfully.

Nonetheless Professor Marley noted there were significant challenges in the early years. Recruiting suitable staff was and continues to be a major challenge. This is especially so for medicine where clinicians can earn so much more being clinicians than they can by working in a medical school. The challenge to recruit staff meant that the workloads of the IMU staff were high and this in turn can lead to high staff turnover. IMU was brave in introducing a problem-based learning (PBL) curriculum in an environment wholly unfamiliar with such a concept. The anxiety around PBL was in staff as well and a parallel didactic curriculum grew up and this in time was reinforced by assessments being set on the unofficial didactic curriculum. PBL tutors were teaching rather than facilitating. Compounding this was a perception that IMU students would be different to students in more Western countries and not be vocal enough for PBL. Some parents contributed to the anxiety by thinking their children needed to be taught rather than taught to enquire. The Partner Medical Schools were also a significant challenge in the early days with each thinking that the way they educated students was the best and the only way that it

should be done. IMU had the unenviable task of trying to synthesise these conflicting views and reach a compromise.

Professor Michael Orme also remembers the challenges in the early years both in Malaysia and the UK. The one concern he had was the quality of the students. He was quite surprised (and delighted) that IMC was allowed to go ahead with student entry based on merit rather than the admission criteria applied to other public medical schools. He was also concerned as to how the first cohorts of new IMC graduands would be assessed when they went to their partner medical school for clinical studies. As it turned out, some of the IMC students were eventually among the top of the class in Liverpool (and in other UK medical schools) and their ability to speak good English was also impressive.

The UK medical schools also had to “do battle” with the UK government concerning the financing of the project in the UK. Michael was closely involved with discussions about what was known as “SIFT” (the Special Increment for Training) which brought extra government funding to cover the increased costs of delivering health care in hospitals where medical students were taught. This became a very complex issue and was best solved by each medical school discussing the matter with their regional health authorities.

What then for the next 25 years? Joseph Gonnella, the former Dean of Medicine at the Thomas Jefferson College of Medicine in Philadelphia feels that IMU should now focus on postgraduate education and in particular continuing professional development. IMU should also move into health policy research. Professor Gonnella is convinced that there is only so much education can do. The health system and its

methods of reward has a far greater influence in changing health professionals' behaviour and producing better patient outcomes in Malaysia. However policy changes can only be made based on good quality data and that IMU should work with relevant parties to produce such data.

Professor Michael Orme shares this view for the future. He would like to see IMU encouraging the development of research in subject areas that are not linked directly to medicine and which are particularly relevant to the development of Malaysia.

Professor Ron Harden, who was closely involved in the establishment of IMC is of the opinion that the concept of internationalisation should be revisited. IMU should have a real sense of pride in what has been achieved. IMU will continue to evolve but the challenge is whether IMU should build on its achievements and strong base to lead a new wave in medical education. Perhaps IMU's direction should be towards an 'edu-glomerate' where students have an opportunity to mix and match programmes from a variety of local or international providers. Professor Ron Harden concludes, "This is a vision I share and could represent a future direction for IMU."

Prof Victor Lim

Vice President, Education

International Medical University





IMU VISION AND MISSION

*Er Hui Meng, Peter Diakow, Ammu Radhakrishnan, Stephen Ambu,
Hla Yee Yee, Muneer Gohar Babar, Shar Mariam Mohamed and Gnanajothe Ponnudurai*



2.1 History of IMU

The International Medical University (IMU) is Malaysia's first and most established private medical and healthcare university with over 23 years of dedicated focus in healthcare education. It is the first university in Malaysia that offers conventional and complementary medicine, all under one roof. Established in 1992, the University enjoys an international reputation, and provides a high standard of education at pre-university, undergraduate, postgraduate and continuing professional development levels. The IMU's curriculum for its undergraduate programmes has been benchmarked to international standards and is accepted by international partner universities for credit transfer into relevant programmes. The achievement of Tier 5 or "excellent" in the Rating System for Malaysian Higher Education (SETARA) is evidence of the IMU's excellent quality in teaching and learning.

The IMU pioneered the world's first Partner Medical School programme, allowing students to start their education in Malaysia while completing and earning a degree at an international university. Over the last 23 years, the IMU has grown from a medical college with 5 partner universities in 1992, to an internationally recognised higher education institution with more than 30 renowned international partner universities.

The IMU's Learning Model is grounded on its core values, which fosters students' development into knowledgeable and competent healthcare professionals who are critical thinkers, reflective and yet proactive. The aim is to create healthcare graduates who are committed to lifelong learning and are imbued with a sense of good citizenship, leadership and ethical behaviour.

In its continual quest for academic excellence, moving into research was a natural progression with medical and

healthcare-related research, as well as health professional education being key areas of focus. The IMU's research efforts are being further strengthened by the Institute for Research, Development and Innovation (IRDI) which was established in September 2012. The four centres of excellence under IRDI drive the strategised research initiatives.

The university had a major breakthrough in 2010 with the start of its Healthcare Centre which permits the IMU's staff and students to receive and treat patients. The Healthcare Centre, which serves as a teaching site for some programmes, brings the disciplines of allopathic (Western) medicine and those of complementary and alternative medicine together under one roof.

Today the IMU is an integrated medical and healthcare institution, offering education, healthcare and research in partnership with some of the world's most respected individuals and universities in the field of medicine and healthcare.

2.2 Global Developments in Education, Research and Healthcare

2.2.1 Education

Medical education has undergone a series of metamorphoses; some revolutionary, others more subtle. A major change was that following The Flexner Report of 1910¹ which transformed the nature and process of medical education in America with a resulting elimination of proprietary schools and the establishment of the biomedical model as the gold standard of medical training".¹ The tenet of medical education was preparation in laboratories as a prelude to clinical training; the so-called "traditional curriculum". The Faculty were also freed from patient care and focussed more on teaching and research, so the

educators were no longer healers and the healers were not educators. It is indisputable that significant discoveries were made; molecular biology came into existence, intricacies of biomedical sciences unravelled, even to the cracking of the genetic code and the Human Genome Project. However, there was an uneasy feeling that patients were being used in the service of medicine rather than the other way round. William Osler had warned that the ideals of medicine would change as “teacher and student chased each other down the fascinating road of research, forgetful of those wider interests to which a hospital must minister” and that placing advancement of knowledge as the overriding aspiration of the academic physician was wrong. There appeared to be a misalignment between scientific medicine and professional values embedded in the oaths taken by physicians.

Critics called for a review of the Flexner Report and the resultant changes are now adopted by many medical schools. “Major emphasis is being placed upon the professional formation of students and specific core competencies. Practice-based learning, a Flexner initiative, is supplemented by courses in patient communication, medical ethics and medical humanities. Departments of medical education are now part of medical faculties that train their members to incorporate these ideals into their courses”.

The General Medical Council (GMC) had identified the outcomes of medical education for schools in the United Kingdom (UK) in “Tomorrow’s Doctor” (2003; revised 2009)², which sets outcomes in three categories viz. the doctor as a scholar and scientist, the doctor as a practitioner and the doctor as a professional and standards for delivery of teaching, learning and assessment in nine domains. The Scottish Doctor (2000)³ (Scottish Deans’ Medical Education Group or SDMEG) also spells out the outcomes that the Scottish doctor has to master on graduation.³ This document is more or less aligned to the GMC document.

Healthcare in the 21st century faces numerous challenges including new infectious diseases, environmental and behavioural risks as a consequence of rapid demographic and epidemiological transitions⁴. Reforms in health professional education are necessary and timely. Increased global interdependence as a result of rapid flow of knowledge, availability of technologies and financing across borders, and migration of professionals and patients have made mutual learning and joint solutions possible. The IMU has also conformed to the global trends, utilising integrated, problem-based approaches to teaching/ learning, moving from systems-based to outcome-based to competency-based curricula. Deficiencies in certain domains that have been highlighted in the GMC and SDMEG documents such as holistic approach to patient support (physiological, psychological, social, spiritual), pain management, patient safety, ethics and professionalism have also been addressed.

2.2.2 Research

With non-communicable diseases becoming more important than communicable diseases largely due to health awareness, effective prevention and the advent of effective antimicrobials, researchers worldwide have been turning their attention to cancer research.

Some environmental health problems such as those caused by industrialisation and widespread use of chemicals have resulted in some of our society’s most disputed health concerns such as cardiovascular diseases, cancers and other diseases. Therefore the emphasis is on early detection, and the race is on to isolate more accurate markers for the top cancers like breast, lung, nasopharyngeal, cervical, colorectal, bladder, prostate and lymphoma. There is also a growing interest in herbs as medicines, especially for their anti-inflammatory and anti-mitotic properties which need to be researched on to improve the treatment options that are currently available. The IMU is making significant progress into medical

research nationally and internationally. To realise the 'ASPIRE' initiatives to be an innovative centre of excellence in research, there are four main thrust areas in research under IRDI, viz. Cancer and Stem Cells, Bioactive Molecules & Drug Discovery, Environmental and Population Health and Health Professional Education. The 5-year strategic plan for IRDI is helping to enrich the IMU's research culture and sustain its competitiveness successfully.

2.2.3 Healthcare

Healthcare delivery is made at three levels; the first contact with patients is made at the General Practitioner (GP) Clinics, the second level is at the District Hospitals, and the tertiary level is hospital-based. The hospitals can be General Hospitals or specialised hospitals.

Healthcare is becoming more complex. Inter-professional collaboration is necessary in order to deliver improved patient care and outcomes with more efficient resource utilisation. Information sharing, coordination and communication among the health professionals are essential to ensure quality and safety of patient care. Consequently, inter-professional learning and innovation in health professional training through increased use of technology are essential.

2.3 Current Vision and Mission of the University

The current vision of the University was established in 2001. It states:

"IMU shall be an innovative global centre of excellence in learning and research, supporting a community of scholars and professionals committed to serving society, promoting the development of students to reach their true potential in becoming competent, ethical, caring and inquiring citizens and visionary leaders."



IMU is committed to academic freedom and the principles of equal opportunity in the pursuit and application of knowledge, the highest standards of intellectual, educational and research productivity; and the establishment of a learning organisation that respects the individual."

As an educational institution, the mission is:

- To further strengthen the IMU as a centre of excellence for undergraduate programmes in medicine, pharmacy and other health sciences programmes
- To establish the IMU as a centre for higher education providing training through multidisciplinary programmes
- To establish the IMU as a centre for postgraduate training and continuing professional education
- To train knowledgeable and skilful professionals with high ethical standards who will be dedicated to serve and improve the quality of life of the community
- To train competent professionals with the use of innovative technologies of knowledge especially ICT in the teaching-learning process

The IMU has achieved much growth and progress in the past ten years. The University has remained true to the key elements of its vision to widen access to professional healthcare education, and to use innovative, integrated

and student-centred means to provide that education. The growth has been supported by heavy investment in infrastructure development and expansion in the campuses in Bukit Jalil, Seremban and Batu Pahat, and in the recruitment of staff of high calibre. To date, the University offers a pre-university programme: Foundation in Science, a range of undergraduate degrees in Medicine, Dentistry, Pharmacy, Nursing, Nursing Science, Psychology, Pharmaceutical Chemistry, Biomedical Science, Medical Biotechnology, Dietetics with Nutrition, Nutrition, Chiropractic, and Chinese Medicine, as well as postgraduate degrees in Medical and Health Sciences (by research) and Public Health, Analytical and Pharmaceutical Chemistry, Pharmacy Practice, Environmental Health and Molecular Medicine (by coursework). The student number has doubled over the past ten years, to more than 3,000 currently. Meanwhile, research continues to witness a healthy growth in terms of the number of postgraduate students as well as external research funding at national and international levels.

Under the ASPIRE project (Strategic Plan 2011 - 2015), the respective Schools and Centres in the University have aligned their missions to the University's vision, i.e. "To be a leading private Asian health educator that creates value through integrating education, healthcare and research".

These are:

School of Medicine

To be the preferred private medical school in Asia.

School of Dentistry

To be a leading private dental school in South East Asia in 2015.

School of Pharmacy

To be an iconic School of Pharmacy recognised for its teaching and learning and research accomplishments that creates professionally prepared graduates who are

competent, ethical, caring inter-professional partners committed to serving society.

School of Health Sciences

To be a leading private School of Health Sciences producing graduates for the global market, integrating education, healthcare and research.

School of Postgraduate Studies /

Institute for Research, Development and Innovation

To be recognised as a leading private School of Postgraduate and Research in Asia that creates value through integrating education, healthcare and research.

IMU Centre for Education (ICE)

ICE shall be a centre of excellence for Health Professionals Education (HPE) in Asia.

IMU Centre for Lifelong Learning (ICL)

To be a leading provider of healthcare continuing education in Asia.

IMU Healthcare

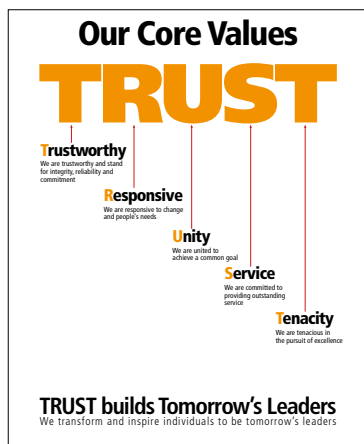
Vision

A patient-centered teaching and learning tertiary Academic Healthcare Centre delivering international quality standards bringing to the community acclaimed selected centres of excellence.

Mission

To surpass the patient expectations with an outcome meeting progressive international standards delivered by an integrated professional team.

2.4 IMU Core Values



The five core values of the University are **TRUST**, which is the acronym for trustworthy, responsive, unity, service and tenacity. It is the University's aspiration that through **TRUST**, individuals are transformed and inspired to be tomorrow's leaders. These core values underpin everything we do in the University.

Trustworthy – We are trustworthy and stand for integrity, reliability and commitment.

Responsive – We are responsive to change and people's needs.

Unity – We are united to achieve a common goal.

Service – We are committed to providing outstanding service.

Tenacity – We are tenacious in the pursuit of excellence.

Besides, all academic and corporate activities are driven by 3 I's (**Innovation, Imagination and Insight**). These include curriculum design, teaching and learning and research.

2.5 Challenges

The working group has identified three challenges in achieving its vision through focus group discussions and interviews with staff, practitioners, students and alumni. These are:

1. Improving social, cultural and physical well-being of the staff, students and community that we serve.
2. Aligning graduates with the paradigm shift in healthcare globally.
3. Shaping the future of healthcare through innovation, imagination and insight.

The university has an international community of staff and students, coming from diverse social and cultural backgrounds. Several initiatives have been taken by the university to ensure a harmonious working atmosphere through mutual respect and understanding, such as regular social functions and activities organised under the Human Resource Department's staff engagement programmes. Besides the regular recreational and fitness classes, an online nutrition and wellness module has been developed to promote healthy lifestyle among staff.

Student support services are constantly upgraded, including support services for international students to help them to get to know the local culture and customs. The IMU has also received students from universities abroad to undertake research for a short stint in the IMU.

The students have interacted well with each other and learnt much about each other's culture through the interactions. Besides, mobility programmes have been introduced to enable staff and students to be exposed to international experience and widen their perspectives. This is increasingly crucial for personal and professional development in this globalisation era.

Through the IMU Cares programmes, staff and students are actively participating in various community engagement projects. In 2013, the Kampung Tekir project won the First Place in the MacJannet Prize for Global Citizenship. This international recognition is a great motivation to all staff and students to continue to serve the societies in need.

In working towards equity and health for all, the goals of medicine in the 21st century have emphasised on disease prevention and health promotion, and provision of basic services through primary care (The Goals of Medicine: Setting New Priorities, Hastings Centre Report, 1996)⁵. Access and equity are the major concerns of the current healthcare system. This must be tackled on the basis of the ethical principle of justice and a patient-centred system. Health professional education should focus on core competencies beyond the command of knowledge and facts. The competencies include patient-centred care, interdisciplinary teams, evidence-based practice, the use of new informatics and integration of public health. Competency-based approach therefore forms the basis for the design of curricula in the IMU, and curricular activities must promote innovation, imagination and insight as much as possible, centred around the core values of the IMU.

2.6 What is This Document About?

This document aims to elaborate on the vision and mission of the University to cater for the interest of all the stakeholders of the University, i.e. students, staff, Partner Universities, Ministry of Education / Malaysian Qualifications Agency, Ministry of Health, professional bodies, shareholders, health professionals, industry, sponsoring bodies and community. The original vision of the University was written in early 2000's. To date, the university has evolved from offering two programmes (Medicine and Pharmacy) at that time to currently more than 10 programmes including Dentistry and a variety of Health

Sciences programmes at pre-university, undergraduate and postgraduate levels. Besides, the University has undergone a steady growth in research and healthcare. A sound comprehension of the vision and mission will set forth the standard for the university operations. This together with the core values form the guiding principles for the institutional development in education, research and healthcare.

The goals are to:

- i. Establish a learning organisation that respects individuals and is committed to serve society.
- ii. Appoint the highest calibre staff and provide opportunities for personal and professional development.
- iii. Uphold academic freedom.
- iv. Produce graduates who are professional and lifelong learners.
- v. Incorporate the principles of equal opportunity in the pursuit and application of knowledge, the highest standards of intellectual, educational and research productivity.
- vi. Deliver quality services for education and healthcare.

2.7 Strategies to Realise the Vision

The working group has identified three areas that the University should focus on in order to achieve our vision:

- i. Alignment with corporate culture and value system
- ii. Investing in people
- iii. Student recruitment and linking with alumni

The various departments must work hand-in-hand to ensure excellence in service delivery, be it education, research or healthcare. A corporate culture based on our core values must be established. The importance of teamwork, collaboration, maintenance of competence, client-centred and quality service must be emphasised in our value system, exemplified through leadership and ingrained into organisational behaviour. The principles of professionalism and ethics must be clearly defined and measurable. These should be embedded in daily activities, continuously strengthened through reflection and feedback.

The success of the University depends largely on its people. A good value system and sound educational philosophy will attract high calibre staff to join the University. As a learning organisation, the University has been investing heavily on the personal and professional development of staff. A university that respects individuals and academic freedom, with a reward system that commensurates with the individual's efforts and success will be able to retain high performing staff. The University promotes innovation, imagination and insight, and respects differences in beliefs and opinions despite the diverse backgrounds, all of which bring about commitment and contributions that will advance the University's goal of becoming Asia's leading private health educator.

The students and alumni are by and large the custodians of the image and reputation of the University. Student selection must be stringent and mechanisms must be in place to rectify undesirable attitudes and behaviours. A 21st century graduate should be a global citizen who is kept abreast with global issues, and able to transform lives through creation, sharing and application of knowledge. Through the IMU Cares programmes, the students learn to connect with the society and work in partnership with the communities. The University should also maintain a strong relationship with its alumni and engage them in its

development. Alumni members can act as mentors to the students, providing them with a real world insight into the workplace from a graduate perspective and advice on the current economic climate that determines the employability of the graduates. Students who have benefited from their overall student experience are more likely to return and contribute to the alma mater in many ways. In summary, a strong alumni association builds a network of future leaders who work together to improve the lives of the others.

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IMU VALUE SYSTEM, CULTURE AND PHILOSOPHY

*Francis Wen, Hanan Abdel Khalek El Sayed Omar, Mak Joon Wah,
Lim Chooi Ling and Annie Yap*





3.1 What Are Value System, Culture and Philosophy?

In today's business world, many organisations are placing more importance on values and operating philosophies or principles that guide their internal conduct as well as their relationship with all stakeholders, i.e. employees, customers, business partners, shareholders and the community at large. This is especially so after the scandals like Enron¹ that have led to tighter controls with the introduction of Sarbanes-Oxley Act (2002)² to increase penalties for destroying, altering or fabricating records or attempting to defraud shareholders. It also increased the accountability of auditing firms to remain unbiased and independent of their clients². The US scandal has shaken the world to realise that good values and integrity at the highest level are fundamental principles for all organisations to have today and the future.

What can we define as a value system? According to BusinessDictionary.com, a value system is "A coherent set of values adopted and/or evolved by a person, organisation, or society as a standard to guide its behaviour in preferences in all situations".³ Wikipedia describes it as "a set of consistent ethic values (more specifically the personal and cultural values) and measures used for the purpose of ethical or ideological integrity. A well-defined value system is a moral code".

Values are defined as how we conduct ourselves and identify what matters to the organisation. The value system links closely with culture. A culture can be described as "Broadly, social heritage of a group (organised community or society)". It is a pattern of responses discovered, developed, or invented during the group's history of handling problems which arise from interactions among its members, and between them and their environment.

These responses are considered the correct way to perceive, feel, think, and act, and are passed on to the new members through immersion and teaching. Culture determines what is acceptable or unacceptable, important or unimportant, right or wrong, workable or unworkable. It encompasses all learned and shared, explicit or tacit, assumptions, beliefs, knowledge, norms, and values, as well as attitudes, behaviour, dress, and language"³.

Merriam-Webster's dictionary defines culture as "the beliefs, customs, arts, etc. of a particular society, group, place, or time. A particular society that has its own beliefs, ways of life, art, etc." In short culture can be described as the way we do things here, our dressing, beliefs, values, philosophy and behaviours.

What about philosophy? According to Wikipedia, the word "philosophy" comes from the Ancient Greek which literally

means “love of wisdom”. Philosophy is the study of general and fundamental problems, such as those connected with reality, existence, knowledge, values, reason, mind, and language. Philosophy is distinguished from other ways of addressing such problems by its critical, generally systematic approach and its reliance on rational argument. In more casual speech, by extension, “philosophy” can refer to “the most basic beliefs, concepts, and attitudes of an individual or group”.

Overall, the value system, culture and philosophy are closely inter-linked with each other and integrate as one where the characteristics of the organisation will be reflected. We believe the culture and the organisation should be built upon our corporate values that we cherish. Whether or not organisations have the right value system in line with their vision and mission would be demonstrated by their fellow employees and their outputs. We are of the view that it is of utmost importance that the IMU takes cognizance of this as our value system, culture and philosophy is the foundation to support what the university aspires to achieve in our vision and mission.

3.2 History of the Development of the IMU's Value System and Culture

Our history started with the incorporation of the International Medical College (IMC) in 1992. It took about one and a half years for the IMC to materialise after careful planning and deliberation. In 1999, the IMC was granted university status and was renamed as the International Medical University (IMU). We were the first private medical college and private medical university in Malaysia. Established with only 73 students in 1992, we have grown to more than 3,500 students in 2015.

With more than 23 years of history and establishment, IMC has evolved from a small entity where the founders were

basically academics in social science and a doctor. During the inception of the college, the employees worked closely as a small team. Things were simpler then with the low student intake. The work processes were straightforward and people worked collectively together to build a dream of establishing the first private medical education institution. The collegial culture of the academics has been embedded as part of the IMU's culture until today.

As the years went by, the IMU has grown from a single Medical School to another additional four schools, i.e. Dentistry, Pharmacy, Health Sciences and Postgraduate Studies. The IMU's unique partner transfer model has been very successful in establishing the IMU as a leading private university in Malaysia. We have made our mark with a strong reputation among the medical practitioners and healthcare providers. The IMU continues to grow with additional programmes and with an increased number of faculty and support staff in tandem with the increased number of students. With that, diversity and complexity increased as our faculty comes from various parts of the world. Indeed by 2011 we had 466 employees of which 40% were expatriates from 18 different countries. In 2013, we grew to 564 employees of which 44% are expatriates from 22 different countries throughout the world. We have employees from Malaysia, India, Myanmar, Pakistan, Sri Lanka, United States, Canada, Britain, Australia, China, Taiwan, Iraq, Senegal, Yemen, Egypt, South Africa, Zimbabwe, and others.

With the richness of cultures and background, the employees influence each other with their way of living and adapting to the Malaysian and in particular, the IMU environment. It is indeed a drastic change and a cultural shock for some who found difficulty in adjusting. The IMU has always been a close community where the collegial culture prevails in faculty since its inception. This has been preserved despite the increased number of new employees from different backgrounds.

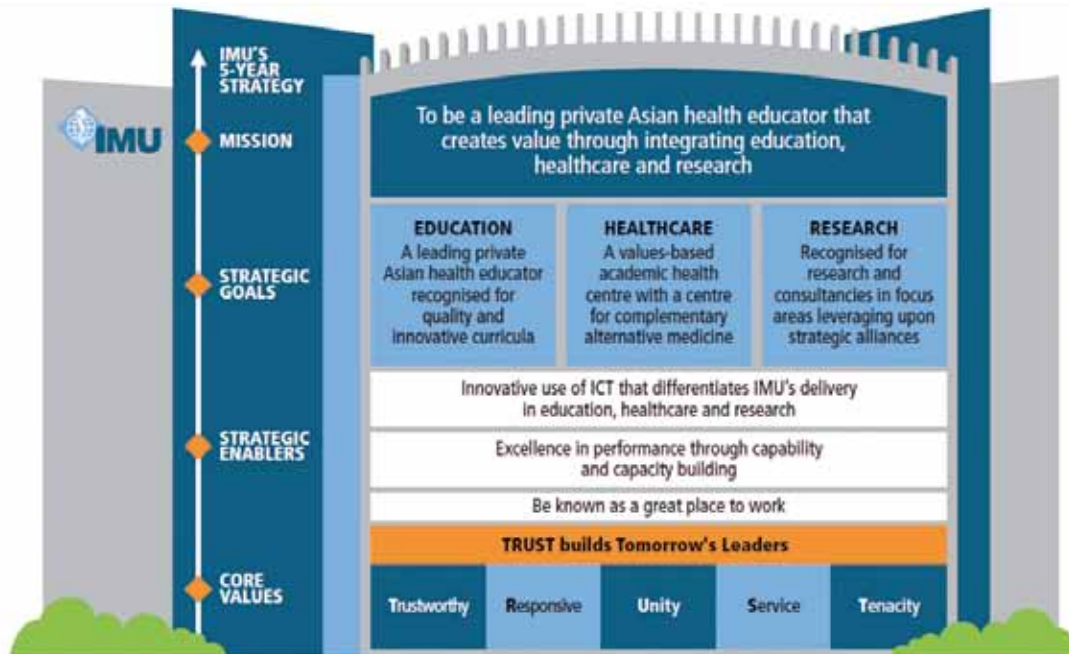
Apart from the diversity of its employees, the organisational structure, policies, systems and processes in the IMU have also been evolving from a very simple structure at inception to a more complex structure now. The IMU has invested in better management systems and automation. The Century system, Kofax, UMIS, SLIM, etcetera, were implemented over the years to meet changing needs.

With the changing organisation structure, there is also a necessity to meet the evolving challenges externally and internally. The education industry over the past 23 years has changed and private higher education has mushroomed into a huge industry. The challenges of our staff being poached by other institutions leaving us with a stretched workforce coupled with the difficulty of recruiting the right candidate poses a great challenge to the IMU. These have also impacted the culture and the way we work here, with more multi-tasking and stretched assignments within our limited resources.

3.3 The IMU Aspire Dream (2011-2015): Core Values as Foundation to Our Strategic Goals

In 2010, the Senior Management of the IMU comprising of all Corporate Heads, Leaders in Academic Management and Professors met to plan for IMU's future. With this our 5-Year Strategic Plan under the name of ASPIRE was born. The ASPIRE plan was launched in 2011 covering the period from 2011 – 2015. ASPIRE is a comprehensive strategy with its mission to place the IMU as a "Leading private Asian health educator that creates value through integrating education, healthcare and research".

Management is aware that the success of our strategic plans depends on developing and embedding a strong values-based organisation, with emphasis on integrity, ethics and professionalism in our activities. We launched our values-based emphasis under the acronym of T.R.U.S.T. which stands for Trustworthy, Responsive, Unity, Service and Tenacity. To expand on these:



“Trustworthy” stands for integrity, reliability and commitment. We should make ourselves trustworthy by demonstrating high integrity with moral ethics and professionalism, being reliable in tasks assigned to us and in executing our responsibilities, and have a sense of urgency and commitment towards ourselves, our colleagues, our students, our patients, the organisation and the society at large. We have to earn our respect and not demand respect with our demonstrated behavior, credibility and humility. We need to “walk the talk” and be a role model for others. Reliability means taking personal responsibility on the needs of our stakeholders and be that someone that they can depend on. Our actions speak for itself in our commitment to live the values.

“Responsive” refers to change and people’s needs. The world is ever changing with the advancement in research and technology. Society’s needs are changing as well with the various generation gaps. We must make ourselves adaptable and be responsive to the changes around us. We need to be responsive towards our stakeholders - our students, patients, parents, employees, Board of Directors, society and the nation. Education and healthcare in the 21st century may evolve into a very different model; we need to embrace it and have forward thinking and wisdom to discern the real need of the people. The 3 I’s of the IMU – Innovation, Imagination and Insight have to be embedded in all of us to discern what are required now and in the future instead of remaining static and backward in our thought.

“Unity” is critical to ensure a strong teamwork to achieve a common goal. We acknowledge that unity is strength and we cannot do everything ourselves with our limited capability. We should possess a genuine intention to work cooperatively with others, to be part of a team, to work together collaboratively as opposed to working in silos or competitively. This includes working effectively and collaboratively within own department, across functions, or

work groups and participating actively as a team player or a team leader to accomplish organisational goals.

To be a good team player we need to understand team objectives, goals and expectations; personal commitment to the team and team decision, even if one does not like it, because it is best for the team. We have to participate willingly in team activities and do our own share of the work and do whatever needs to be done to reach team goals. Apart from this we need to keep other team members informed of our own actions and share relevant or useful information.

We have to express positive expectations of our team and contribute constructively in team discussion. When we are united, we genuinely value input and expertise of others and are willing to learn from others by listening well to understand others’ perspectives. We should help the team develop and maintain clear purpose and direction, develop team cooperation and trust and encourage and empower team members, and make them feel important to the team. We should publicly acknowledge team members who performed well.

Lastly, a good team player needs to have a right attitude, self-awareness, good emotional intelligence, inter-personal and clear communication skills, respect for others, understanding, empathy, compassion, and willingness to bring conflict within the team into the open and encourages or facilitates beneficial resolution of conflicts. In unity, we ought to promote a friendly climate, good morale and co-operation. We need to leverage on the strengths of others to build a desired IMU culture based on our values. The IMU has developed a strong collegial culture over the years where employees come together to help each other and take on additional roles when required to achieve our organisational goals. This has created dedicated team players making our staff the greatest asset in the IMU.

“Service” is a fundamental value where we are committed to provide outstanding service, making peoples’ needs (our employees, students, parents, patients, vendors, suppliers, community, etc.) a primary focus of one’s actions; working in partnership and exhibiting willingness to walk the extra mile with people we interact with to provide the best service and solution; being responsive and taking responsibility for their satisfaction and loyalty.

This requires us to recognise the importance of placing our stakeholders’ needs and interests before our own, giving friendly and courteous service, follow through any inquiries, requests or complaints taking personal responsibility for correcting stakeholders’ service problems. We must correct problems promptly without being defensive and evaluate from both the stakeholders’ and the organisation’s viewpoint in making decisions. We should make ourselves fully available, especially when the stakeholder is going through a critical period and we should take actions beyond normal expectations.

We should make concrete attempts to create value to the stakeholder, to make things better for the stakeholder in some way. We need to review and implement effective ways to monitor and evaluate stakeholder issues and improve the satisfaction level. We should work with a long-term perspective in addressing stakeholders’ problems and anticipate and identify future needs of stakeholders, and design appropriate future products/services/solutions. With all these, we will act as a trusted advisor in stakeholders’ decision-making process.

“Tenacity” describes our eager and tenacious pursuit of excellence. We will aim to be the best and excel in everything we do. We shall never give up easily and persevere when we face obstacles and challenges. We practise continuous improvement in our pursuit of excellence and continuously learn from each other to

achieve the best results and outcome. This requires a lot of self-leadership, the ability to have self-drive and passion for delivering excellence. One will set challenging goals for self and motivate oneself and others to greater heights. The success of this arises from the ability to know one self, self-motivate, communicate effectively and receive feedback positively to move forward. One must be able to have self-confidence, insight and drive high standards of performance to achieve organisational excellence. These will assist us in developing a performance-based culture and a learning organisation.

The above values should be embedded in our day-to-day life and be institutionalised in the IMU as they are the foundation that holds together all our strategic pillars to make the IMU a leading private Asian health educator that creates value through integrating education, healthcare and research.

3.4 Redefining Our Core Values, Culture and Philosophy for the Future

3.4.1 Objectives

Over the years IMU’s core values have not changed; they were, are now and forever shall be the same. Since day one, we have always emphasised on demonstrating high integrity, ethics and professionalism. We want to be students and patients centred; we stress on quality, the 3 “I’s” – Innovation, Imagination, and Insight. While we strive to be the best, we acknowledge that we need to be humble for it is a virtue one has to develop.

The only change is the approach in interpreting and demonstrating these values which may be perceived differently by the various individuals. Hence, it is important that we brace ourselves and be mindful of the different generations and how we engage them to be in line with

our value system. Here, we would want to redefine our values, culture and philosophy for the future to be linked with the following fundamental areas:

3.4.2 Link with IMU's Vision and Mission

(See Section 1, Chapter 2 on IMU Vision and Mission)

3.4.3 Link with IMU's Education and Healthcare Philosophy

(See Section 2, Chapter 8 on IMU Educational Philosophy, Learning Model and Graduate Attributes)

3.4.4 Link with Medical Professionalism and Ethics

(See Section 1, Chapter 5 on Bioethics and Professionalism at the IMU)

3.4.5 Link with Non-Medical Professionalism and Ethics

(See Section 1, Chapter 5 on Bioethics and Professionalism at the IMU)

3.4.6 Link with Scholarly Activities, i.e. Research, Learning, Teaching, etc.

(See Section 1, Chapter 6 on Academia and Scholarship at the IMU)

3.5. The IMU as a Values-led Organisation

In order to develop a values-based organisation, several HR strategies that can be taken are:

3.5.1 Values-based Recruitment (staff and students)

Our human resource is our greatest asset and it is critical to select and recruit the right people into the IMU where they can value add to the organisation. It is of utmost importance to identify candidates who share and believe in our values and the way we do things here. While it is

important to look at the right academic qualification (for faculty), experience, skills and the right motivation, the right cultural fit is important for one to achieve his or her full potential.

Although we provide all employees with the opportunity to grow with the company, it is critical that their aspiration fits into the organisation's vision, mission and core values. It is only by recruiting those who share our values that we can move forward in tandem with the organisation's goals. Hence the selection of candidates must be done through a thorough selection process. Behavioural event questions on values should be asked during interviews to gauge the values held by the candidates. Reference checks before offering positions to ensure no record of breach in integrity, ethics and professionalism should also be made mandatory. Psychometric tools used, where necessary, should also emphasise on values which are in line with those of the organisation. With these precautions taken, there will be reduced risk of hiring those who do not share our values.

This also applies to selection of students into the IMU programmes. During the interview sessions, the interviewers should ensure that the students' values are in line with those of the IMU before offering them a seat in our programmes.

3.5.2 Values-based Performance Management

Similarly to recruitment, we need to embed our core values in every aspect of our IMU life. The most effective way is to create a platform where employees are reminded that they will be assessed based on "behaviours driven by values". In this aspect the IMU's values takes precedence where employees will be measured on how they have demonstrated our core values. Here, we suggest a relook at our performance management competencies and to embed our core values as part of a critical assessment

at each performance appraisal. This should be discussed at performance management review carried out twice a year. With the frequent reminders and the emphasis in our performance management system, employees will need to work on how to demonstrate the practice of these core values. Employees who did not demonstrate our values or behave contrary to our value system will risk being rated lower, which impact on their bonus or are subjected to disciplinary action for infringing our value system.

3.5.3 Values-based Incentives and Rewards

The IMU's existence is to create value for its stakeholders – its shareholders, students, patients, employees, and society at large. The IMU strives for quality and excellence in everything it does. Hence, the incentives and rewards must be designed to create value and measurable outcomes of what we promise to deliver. Our compensation philosophy is to move towards performance or outcome-based rewards. We would want our goal setting and key result areas to meet the S.M.A.R.T. principles – Specific, Measurable, Achievable, Relevant and Time bound.

Our employee will be rewarded based on their delivery and creation of value which are measurable. Currently we have our Performance Management System that measures achievement of Key Performance Indicators (KPI) and competencies. As to competencies, we should ensure that our core values are measured during appraisal. Employees that have demonstrated these values will be rated favourably and be rewarded.

Apart from the annual Performance Appraisal, there are also Achievement Awards given out to employees that have met the criteria of the various categories of awards to encourage individuals and teams to deliver outcomes that deserve to be recognised and rewarded.

3.5.4 Values-based Training and Development

Values-based training and development is the approach in which our programmes must run consistently on values and the outcomes measured. Here we need to focus on creating value for our stakeholders, managing value for the organisation and evaluating values to ensure we are on the right path.

Our training and development initiatives must focus first on the organisation's needs. The individual employee's needs will then follow through to align themselves with the organisation's goals. Our training and development focusses on teaching scholarship, professional development and individual development. In our competency based training, we should incorporate values that can be measured. The outcome of the programmes should be measurable for its value.

Training on core values is carried out during Induction Programmes for new employees to assimilate them into the IMU culture. An important training we have in IMU is the Cultural Sensitivity Workshop where we try to create awareness and understanding among employees with regards to the diversity of employees. Adequate emotional intelligence is required to integrate our faculty into our IMU values and culture especially those who come from very different backgrounds and culture.

3.5.5 Values-based Leadership

In Harry Kraemer's book⁴, "From Values to Action: The Four Principles of Values-Based Leadership" he mentioned that becoming the best kind of leader is not about emulating a role model or a historic figure. Rather, our leadership must be rooted in who we are and what matters most to us. When we truly know ourselves and what we stand for, it is much easier to know what to do in any situation. It always

comes down to doing the right thing and doing the best we can. Doing the right thing is a lifelong challenge for all of us.

The four principles which Kraemer gave are focussed mainly on self-reflection, balance, self-confidence and humility. Self-reflection is about the ability to identify and reflect on what we stand for, what our values are, and what matters most to us. To be a values-based leader, we must be willing to look within ourselves through regular self-reflection and strive for greater self-awareness. After all, if we are not self-reflective, how can we truly know ourselves? If we do not know ourselves how can we lead others?

The second principle is balance, which means the ability to see situations from multiple perspectives and differing viewpoints to gain a much fuller understanding. Balance means that we consider all sides and opinions with an open mind.

The third principle is true self-confidence, accepting ourselves as we are. We recognise our strengths and our own weaknesses and strive for continuous improvement. With true self-confidence we know that there will always be people who are more gifted, accomplished, successful and so on, than us but we are good with who we are.

The fourth principle is genuine humility. Never forget who we are or where we came from. Genuine humility keeps life in perspective, particularly as we experience success in our career. In addition, it helps us value each person we encounter and treat everyone respectfully.

The person who practises these four principles need not be of a leader that holds a high office position with many staff reporting to him or her. It can be applied by anyone, from the President to the most junior staff. It is truly leadership at all levels. It is never too early or too late to become a values-based leader.

3.5.6 Towards a Learning Organisation

As an academic institution, the IMU has always embraced itself striving to be a Learning Organisation. According to Victor Lim (2013)⁵ (IMU as a Learning Organisation), “a learning organisation is an organisation that facilitates the learning of its members and constantly undertakes to transform itself.”⁵ It is an organisation where its people work collaboratively in an atmosphere of openness and trust to continually self-improve and innovate in order to achieve a common vision”. There are many benefits of becoming a learning organisation and IMU’s vision clearly indicates that we are committed to be a learning organisation. We have put in place a Learning Organisation Framework to be more structured in our approach, taking into consideration Peter Senge’s five elements of a learning organisation – systems thinking, personal mastery, mental models, building a shared vision and team learning as well as the seven dimensions⁶

1. Connect the organisation to its environment
2. Create continuous learning opportunities
3. Provide strategic leadership for learning
4. Promote inquiry and dialogue
5. Create systems to capture and share learning
6. Encourage collaboration and team learning
7. Empower people towards a collective vision) used to assess the characteristics as a learning organisation.⁶

We have also conducted a Dimensions of the Learning Organisation Questionnaire (DLOQ) survey to provide a clearer overview of the current baseline and culture to support the transformation of the IMU into a learning organisation.

Many initiatives and action plans have been drawn out to support the seven dimensions of our learning organisation model in the IMU. The challenge is to measure its successes and learn from these experiences.

3.6 Internalising Our Core Values: Applications and Action Plans

3.6.1 Employees

The employees in the IMU comprise of corporate and academic staff from various ethnic, race, religion, culture and nationalities. It is truly an international university where 50% of the academic staff are non-Malaysians. With these diverse backgrounds it is critical to hire right at source. We need to recruit candidates who believe and share our IMU value system. This can be done through interviewing techniques using behavioural event interview questions focusing on values of the candidates, what they believe in and whether they are in line with the IMU's values. Other methodology would be through selected psychometric tools.

As for existing employees, we need to first create the awareness and understanding of our core values - what are they, why is it important to us, when do we demonstrate and lead by example of the values, how do we measure the outcome of the behaviours that reflect these values. It is only through a deep understanding and correct interpretation of our values that our staff can share the same frame of reference when we talk about our value system and culture. After creating the awareness and understanding, we need to get the buy-in of the faculty on why we need these values and how it can benefit all of us if we share and live the common values. Once our staff are convinced, hopefully it may translate into change behaviours where we begin to internalise the values into our actions.

The process to institutionalise and internalise our core values is a journey where one requires adequate understanding, support and encouragement. Here the Management and Heads of Department (HODs) need to play their role to promote and support the internalisation of our values. They need to remind employees over and

over and make values a topic of discussion in their regular meetings. The HODs need to remind their staff of the values during performance appraisal and talent reviews; training workshops, meetings, etc. and recognise and reward those who have demonstrated our values to encourage them. Other colleagues do have a role in encouraging one another to live the values with pride and dignity. Sources of reference for the various groups are as follows:

3.6.2 Students

Malaysian and International students.
(See Section 1, Chapter 5 on Bioethics and Professionalism at the IMU)

3.6.3 Healthcare

Patient first - orientated
(See Section 1, Chapter 5 on Bioethics and Professionalism at the IMU)

3.6.4 Patients

(See book on Serving the Community at the IMU)

3.6.5 Society

Service to the community
(See book on Serving the Community at the IMU)

3.7 The Role of Leaders in Executing Our Value System

3.7.1 Definition of Leaders

Although leaders frequently wield considerable or relatively more power than those who are being led, it is not always appropriate to equate power with leadership. This apparent paradox is influenced by the dynamic relationship

between leaders and those they provide leadership to. This relationship evolves with the environment where the interaction between leaders and those who are led take place. It is possible that the dynamics of this interaction will provide the potential for identification and development of leadership skills and styles which may supplant existing ones that are less appropriate in the evolved situation.

Much research on leadership styles especially in the cross-cultural context is available and this has been adequately reviewed by Dickson et. al. (2003)⁷. As pointed out, the impact of cultural values will influence the leadership styles and power of leaders and behaviour of followers. We need to reflect on this as we analyse the role and impact of leaders within the value system of the IMU.

It may be worthwhile to broadly classify leadership in any academic institution into organisational and academic leadership even though there is considerable overlap between them.

3.7.2 Organisational and Academic Leadership

Organisational Leadership

Organisational leadership is seen as the umbrella under which other leaders derive their roles and functions. The organisational leadership provides the strategic direction and framework for achieving organisational goals which are formulated within the broader context of the governing body of the organisation and in consonance with public, national and global influences. The IMU as an academic organisation has reached maturity with its 23 years of existence. Amongst one of the most important factors contributing to its successful existence is the availability of effective organisational leadership. This has provided the framework and boundaries within which academic leadership can develop the educational philosophy, learning

model, and desired outcomes of the various academic programmes.

Academic Leadership

Educational leadership finds expression in the philosophy of the IMU's learning model, including its curriculum delivery, assessment, and expected outcomes for all its programmes at the pre-university, undergraduate, postgraduate and continuous professional development programmes.

Research leadership is manifested in the governance of the research process at the IMU and in the continuous audit of the relevance of its research emphasis. The IMU-Joint Committee on Research and Ethics (IMU-JC) was formed in 2002 and has been recognised by the Ministry of Health Malaysia (MOH) since its formation. The composition of members, functions and activities of the IMU-JC have been evaluated by the MOH and duly endorsed in 2013 as being in compliance with national ethical standards. Traditional output indicators of excellence in biomedical research such as impact factor, Hirsch index, and publications in tier one Web of Science ISI Indexed journals are measured yearly and compared with both public and private universities. In addition, there is a conscious effort to relate the research findings to applications in the medical and health sectors, and to industry. As part of the evaluation process and to enhance the relevance of the research at the IMU, the Institute for Research, Development and Innovation (IRDI) was set up in September 2012. The four Centres of Excellence (CoE), namely, (a) Bioactive Molecules and Drug Delivery, (b) Cancers and Stem Cell Research, (c) Environmental and Population Health, and (d) Health Professional Education Research, were formed to provide the leadership and drive to the next level of research. The bold move was taken based on the research expertise available and researchers' success in obtaining external research funding for the last five years (Table 3.1).

Table 3.1 Research funding at the IMU, by source of funding and year, from 2009 - 2013.

Year	Research Funding (RM)		
	Internal*	External	Total
2009	535,020	701,462	1,236,482
2010	951,610	558,272	1,509,882
2011	528,552	1,465,465	1,994,017
2012	434,181	1,112,091	1,546,272
2013	424,142	1,670,200	2,094,342

* Excludes undergraduate projects

Leadership Styles and Skills

In general, leadership styles at all levels will influence not only activities but also the outcomes in an organisation. While the greatest influence on organisational behaviour and performance will be from top management leadership, middle and lower management leaders also yield substantial effect.

Leadership skills that are needed to ensure the vibrancy and success of any organisation have been identified by many and Leslie (2009)⁸ lists the essential characteristics: (a) Leading employees, (b) Strategic planning, (c) Inspiring commitment, (d) Managing change, (e) Resourcefulness, (f) Being a quick learner, and (g) Doing what it takes.

Is there evidence that these essential characteristics and more importantly, activities and decisions reflecting them, are being followed in the IMU? Examples of academic leadership include the formulation and practice of the IMU learning model, our curriculum delivery, and in the quality of our graduates of the various programmes. Strategic planning for the IMU finds expression in our ASPIRE Plan for the period 2011-2015. We have conducted the mid-

term review for this plan and are currently planning for the next 5 years. Commitment from all levels of staff is needed for success of any strategic plan and the strong emphasis by leaders in the IMU on the necessity to internalise the IMU value system into the daily activities of both staff and students is constantly being monitored. Management of changes in the external and internal environment of the IMU is also constantly being addressed. Examples of effective management of these are seen in the succession planning for key leadership positions to meet challenges. The IMU has identified the next generation of leaders and have provided them with the required exposure, nurturing and training to assume these key positions in due course. In the process it has looked both internally and externally to source for the appropriate people to fill these positions.

Leaders as Role Models

The importance of role models in all spheres of human interaction is well known and leadership by example is a powerful tool to learn both appropriate and inappropriate behaviour. It is thus essential to define the meaning and effect of role modelling in the academic environment. Senior members of the Faculty are expected and indeed

looked upon to provide leadership and serve as role models for their younger colleagues. Role modelling can be conscious and purposeful but it is argued that spontaneous role modelling qualities will have greater impact on others. Academic leaders must practise the right values expected of a scholar⁹ in a learning organisation⁵. As stated, academic leaders through their intellectual discourse within a learning organisation that emphasises the core values of professionalism, ethics, critical thinking and learning ethos, will stimulate similar values amongst colleagues.

Is there evidence that these values are being observed and emulated by members of the organisation? Evidence and outcome measurements are difficult to define, but can perhaps be measured indirectly in the research area by the willingness to share research ideas and research activities through collaborative research projects that cut across disciplines. Indeed all approved internally or externally funded projects are multi-authored and multi-disciplinary. Research leaders must share ideas and nurture younger minds in critical appraisal of the research findings, their interpretation and directions for further research. A monthly research meeting where graduate students and faculty present their research findings has been in existence for the last eight years. These meetings are appropriate avenues for such intellectual discourse and critical appraisal for mutual learning and practice of leadership skills.

Principle-Centred

Personal values and interest are important in setting individual goals. These should be in consonance with organisational values and interest. Where there are potential areas of disagreements and conflict, leaders must manage decision making that is not only fair but seen to be fair. Sometimes hard decisions have to be made in the best interest of the organisation but the effects of the outcomes must be anticipated and managed. The IMU has

policies which address issues of professionalism, ethics and misconduct which govern the activities of both student and staff. The appropriate guidelines for students and staff, as well as educational programmes on the prevention of such inappropriate behaviours are integrated into the teaching and learning programmes as well as orientation programmes.

Education Leadership

Leadership in the teaching and learning activities of students is central to an academic organisation like the IMU. Academic leadership must be evident at all levels and an example of the framework of the required leadership at the programme level is well discussed in Johnston & Westwood (2007)¹⁰. Educational leadership at the IMU, especially in the provision of the unique model of credit transfer to partner medical schools for the past 23 years is a prime example of such leadership. The philosophy and history behind this have been adequately captured by Young (2013)¹¹. Leadership in education for all health professional programmes at the IMU was again eminently visible in the crafting of the IMU Learning Model in 2008¹². An important leadership initiative is the requirement that all academic staff be trained and certified through its Basic Teaching Licence certification course.

Mentor and Coach

Much has been written on the roles of a leader as a mentor and coach and various senior faculty have addressed this adequately for the learning environment⁵, and in the research setting¹³. At the undergraduate level mentees are assigned to mentors; the common experience is that both parties seldom meet until problems arise (mainly assessment performance) or when mentees need the agreement of mentors for their elective postings, and advice on transfer to partner medical schools. A better mechanism should be

in place so that maximum benefit can be derived for both parties. It would also be appropriate that some thought be given on the development of a robust mechanism to evaluate the effectiveness of the mentor-mentee system.

Inspiring the Core Values of IMU

The IMU core values have their foundation in the 3 I's of its logo, namely, Innovation, Imagination and Insight. The 3 I's together with the core values of the IMU are given the acronym of TRUST as discussed above. These core values guide our teaching/learning, research, service, and consultancy activities and all staff and students are expected to internalise these core values. The monitoring of adherence to these core values are carried out continuously at all levels and the outcome measures are reflected in the mid-term and annual staff assessments.

3.8 Challenges in Execution

3.8.1 Commercialisation Versus Idealism

The IMU's success has caught the attention of big players in the commercial world where it has been acquired by the Khazanah Group few years back and made part of the IHH Group which is listed in both the stock exchanges in Kuala Lumpur and Singapore.

The IMU's philosophy is very different from a typical commercial entity. Although we acknowledge the need to be profitable and meet our shareholders expectations, we also have a noble vision to produce the best quality graduates and give back to society as part of our contribution towards nation building. Our model is to produce future leaders with high quality, ethical and moral conduct in our curriculum and be patient-centred in healthcare. Our students and patients come first. The emphasis on our core values and professionalism is our guiding principle.

Even our model for the Academic Health Centre focusses on salaried doctors rather than independent consultants where most private hospitals adopt. Here, the need to balance between profitability and our values is an increasing challenge especially with the rapid competition from other private and public institutions similar to ours. Our staff are being poached by our competitors, lured with higher remuneration and benefits. To attract and retain our talents, we may have to pay them competitively resulting in higher operational costs. The regulatory bodies' insistence on tight staff: student ratios, the increasing utilities cost, and the implementation of GST in 2015 will also push up inflation which will impact our operating costs. In order to ensure smooth operations, the university needs to be more profitable to cover the escalating operational costs. The fear of compromising too much at the expense of quality is a concern.

3.8.2 Diversity in Academia and Students

The second challenge is the diversity in academia and students.

ACADEMIA

Managing Cultural Diversity in an Organisation

The definition of culture according to the UNESCO Social and Human Sciences glossary is "...that complex whole which includes knowledge, beliefs, arts, morals, laws, customs, and any other capabilities and habits acquired by [a human] as a member of society"¹⁴.

Cultural diversity is a representation of various races or ethnicities, nationalities and religions within a community. In an organisation such as the IMU, cultural diversity has been known to bring about unique challenges in integrating a central value system and philosophy. A workforce of different nationalities and cultures may contribute to conflicting values in the roles of individual

employees. However, diversity, if managed effectively, can provide a distinct competitive advantage.

As illustrated in The Executive from the Academy of Management, a multi-national organisation which manages its cultural diversity will benefit from cost savings (less staff turnover), an edge in resource acquisition, improved marketing efforts, an increased level of creativity, better problem-solving (due to heterogeneity in decision-making), and a more flexible system in response to environmental fluctuations¹⁵. A successful organisational culture would value differences while upholding a prevailing value system, and practise cultural inclusion rather than segregation.

In a 2006 review of the GLOBE study of culture, leadership and organisations, the leadership mind-set has been found to shift from the individual leadership theory (ILT) to the cultural leadership theory (CLT)¹⁶. The Value-Belief Theory portrays a society in which the values and beliefs of representatives from different cultures affect both the level of enacted behaviours and the degree of which the behaviours are regarded to be acceptable, legitimate and effective. The GLOBE study investigated nine cultural dimensions which influence leadership styles in a culturally-diverse organisation; including future orientation, gender egalitarianism and humane orientation.

Cultural Diversity in the IMU

Statistics from the Human Resource Department emphasises the fact that the IMU is a truly culturally-diverse organisation, employing faculty of about 16 nationalities from around the globe (Figure 3.1). More than half of the employees expectedly comprise of the local workforce, whereas about 25% of staff are expatriates from the Indian continent. This melting pot of cultures provides a fertile ground for exchange of ideas and a heterogenous pool of bright minds working towards a common organisational mission.

However, staff diversity also unveils a clash of various norms and beliefs which may be detrimental to rapport and collaboration. Variations in interpretation of events may result in misunderstanding and awkwardness if failed to be managed appropriately. A dissonance in values also lies in the leadership styles between individuals from Western and Asian countries. A 1997 study revealed that there was cultural universality in some leadership behaviours, but culturally-specific behaviours in aspects of leadership such as directive, participative, and contingent punishment¹⁷. It is commonly suggested that individuals from a Western-culture upbringing are more direct, assertive, and expressive in highlighting their views compared with their Asian counterparts.



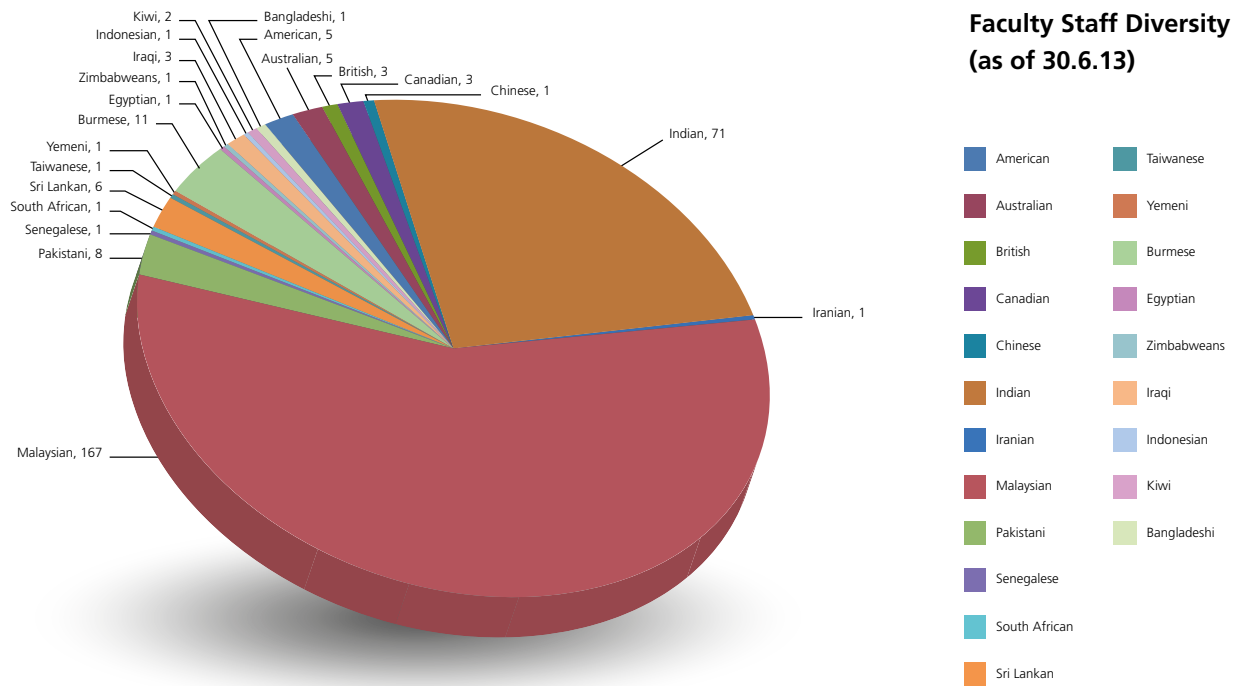


Figure 3.1 Nationalities of employed faculty in the IMU

Challenges in cross-cultural communication also become an underlying hurdle to achieve mutual understanding and unity. Although the medium of communication is English, variances in colloquial terminology, accents and articulation require extra effort from all parties to establish effective discourse. This is vital in decision-making processes where discussions play an important role to shape the direction of university policies.

Enhancing Cultural Inclusion in the IMU

How does the IMU diminish cultural barriers to develop an organisation united under a single value system? A key factor is the comprehensive support provided for expatriate staff. The Expatriate Management Section under the Employee Engagement unit in the HR Department handles all expatriate matters from pre-arrival (work permit

application), arrival (airport pickup) to settling down in the organisation (orientation, EPF registration and banking). The unit even goes to such lengths as to help expatriate staff source for accommodation and education opportunities for their children. This caring culture allows foreign employees to adapt quickly to the country and organisation, thus easing them into the institution’s value system.

In the IMU ASPIRE 2011 - 2015 Strategic Plan, several strategic initiatives have been in place to make the IMU a ‘great place to work’. Among these, initiative S06 strives to create a conducive work environment to boost morale, efficiency and productivity through improving work culture, developing work-life programmes and employee support schemes. The establishment of an attractive total reward system is also expected to attract, motivate and retain local and foreign talent.



Activities that improve the staff's sense of 'belonging' to the IMU also contribute to enhancement of cultural harmony and unity. An annual University Day is held to commemorate and reward staff achievements and organisational milestones. Teambuilding activities held in conjunction with the University Day create a fun and relaxed atmosphere to develop teamwork and cross-cultural understanding among all levels of staff. In addition, staff trips organised every few years serve as an ingenious platform to learn about different cultures and traditions, whilst participants establish rapport with each other on a more personal level. University-wide festive celebrations introduce staff to a fascinating array of cultures and beliefs which further enriches their cultural experience.

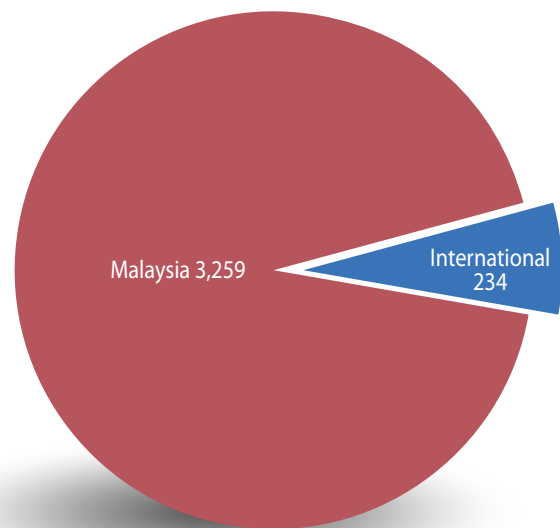
Perhaps it is timely to learn from established strategies to transform from a traditional organisation into a truly culturally-diverse one. The key components to achieve this include the commitment of all levels of management to cultural diversity (leadership), managing and valuing diversity (MVD) training, research on diversity-related issues (such as equal-opportunity profile data), a review of the HR culture and management systems (including recruitment and performance appraisal), and institutionalising change as part of regular processes (follow-up)¹¹.

STUDENTS

Diversity and Inclusiveness in a Medical School

It is well established that diversity plays an important role in higher education, including the health professions¹⁸. Diversity amongst the student body in a medical school is especially relevant as it creates a more holistic learning environment and prepares undergraduates for service in a multi-cultural society. Other benefits of a diverse student population include enhancing communication and patient-care outcomes, as well as encouraging innovation in brainstorming solutions.

A recent study by Dhaliwal et. al. (2013) revealed several challenges faced by a culturally-diverse medical school in the United States¹⁹. Within the student population, there were tendencies for bias against minority groups, conservative religions and values, gender, low socioeconomic status, and even non-native English speakers. Prejudice against individuals with different religions and conservative values ranked the highest among participants of the study. Recommendations to improve the diversity climate and increase inclusiveness include extending the definition of diversity in the institution to include religious, spiritual values and political beliefs, as well as organising diversity awareness and training programmes encompassing all members of the learning community.



List of international students by country

Country	No.	Country	No.	Country	No.
Algeria	1	Japan	1	South Korea	10
Australia	15	Kenya	3	Sudan	2
Bahrain	1	Libya	2	Sri Lanka	28
Bangladesh	4	Maldives	20	Sudan	2
Brunei	1	Mauritius	9	Taiwan	3
China	1	Myanmar	14	Tanzania	4
Cameroon	1	New Zealand	3	Thailand	2
Canada	2	Nigeria	12	Tunisia	1
Gambia	1	Pakistan	5	Uganda	1
Hong Kong	6	Philippines	1	Vietnam	1
India	23	Seychelles	1	Yemen	1
Indonesia	7	Singapore	33	Zimbabwe	3
Iran	8	South Africa	1	Others	1

Figure 3.2 Nationalities of the student population in the IMU (as of December 2013)

Student Diversity in the IMU

As with its namesake, the IMU is truly ‘international’. Data from the Academic Services Department showed that the IMU is home to a multicultural amalgam of students from more than 40 nationalities, although Malaysians comprise of the vast majority (93%) (Figure 3.2).

As the Learning Model in the IMU strongly encourages teamwork, learning in a culturally-diverse climate poses a myriad of challenges. For instance, problem-based learning (PBL) sessions require students in groups of ten or less to execute productive discussions in order to achieve their learning outcomes. This is where command of the English language and communication skills plays an important role in achieving the objectives. Facilitators often find that the students’ cultural background influences articulateness, willingness to participate, and in the group dynamics.

In addition, the contrasting value systems of students from different nationalities may impede the assimilation of the IMU core values in their everyday lives. If students find it difficult to adapt and understand the values of individuals from ethnicities unlike their own, accepting a set of institutional principles may be a challenge in itself.

Improving the Diversity Climate in the IMU

International student support by the Student Services Department (SSD) and Student Representative Council (SRC) play a pivotal role in assisting foreign undergraduates acclimatise to the culture of the institution. The IMU International Student Handbook supplies comprehensive information on travel documents, accommodation, financial, transportation and other matters. Pastoral care for international scholars is offered through the initiative of the International Student Society (ISS). Besides a welcoming

party for the international students, all new undergraduates would participate in an intensive orientation to assimilate into the IMU culture. The official SRC website offers helpful details such as places of interest and access to daily necessities.

Student participation in clubs and societies is highly encouraged in the IMU to enhance inter-cultural understanding whilst honing important life skills. For this, the SRC can help direct interested individuals through the provision of the respective club president's contact details, as well as brief new students on the purpose and activities for each club. University faculty/student team-building activities such as sports events (the IMU Cup) and community service projects (through the IMU Cares initiative) develop inter-professional and intercultural rapport amongst the student community.

Differences in norms and beliefs encourage the tendency of students to establish cliques of similar ethnicities and educational backgrounds, where they would be more comfortable expressing themselves in their mother tongue. This is a barrier to effective communication for collaborative learning. To enhance inter-cultural communication, the IMU upholds an English-speaking policy for all communications on campus. It is believed that when the entire student population uses the same lingua franca, meaningful collaborative learning will ensue. Among the strategies implemented by the Language Department to improve English proficiency include compulsory English modules for all undergraduate programmes in the IMU, and the IMU 'tea party' for students needing additional support.

In nursing education, a study in 2010 outlined the pitfalls of cultural diversity in the classroom as well as recommendations for increasing effectiveness with diverse students.⁷ Among the consequences of managing a diverse student body include cross-cultural barriers to

communication. A rather stimulating example quoted from the paper describes the nature of a physician trained in China:

"He was observed on several occasions to pick up a patient's medications, shove the cup under the patient's nose, and command, "Take!"²⁰

The different cultural background of the physician rendered him unable to understand that politely requesting the patients to take their medications is a more appropriate gesture.

For the faculty, developing cultural competence is one strategy for increasing effectiveness within a diverse student population. Understanding one's own personal cultural background as well as the students', self-reflection, and learning from the students themselves are ways to effectively cope with a multi-cultural student body. Instead of relying on the SSD and SRC to ease the 'culture shock' that international students may confront, the initiative to accept and learn from one another's values should be the responsibility of all stakeholders in the IMU.

3.8.3 Generational Gaps

At the IMU, our work force is unique. Apart from the different cultures and nationalities, we are facing the challenge of generational gaps that coexist on the job. The generational diversity can frustrate and challenge the workforce as much as it enriches it. We have employees that cut across four generations (Veterans, Baby Boomers, Generation X and Generation Y or Z, aged above 70 to below 20) in the IMU.

Managing the ages, faces, values and views is an increasing difficult task. It is important to be able to understand the profiles of the four distinct generations, their motivations, desires, work ethics and life-shaping events to find common

ground. The challenge is to create and nurture a work environment that is generationally comfortable and conducive to focus the employees' energies on their work effectively.

While we have a number of Millennials entering the IMU, many older faculty are returning to the IMU after retirement. This is especially so when we are facing challenges of sourcing for medical lecturers who are knowledgeable and experienced to train and mentor our younger faculty and teach our students. Some of these may be retired civil servants that come from a very different culture. To assimilate them with the younger generations and the IMU culture may be a great challenge.

3.8.4 Integrity of Leaders

Another key challenge would be for our leaders to walk the talk in demonstrating our core values. The integrity of our own leaders marks the success or failure of implementing a values-based culture in IMU. Building a culture is more effective from top-down rather than bottom-up approach. If leaders are perceived as not practising what they preach or required to demonstrate, it will be difficult to convince the employees to follow the values that we want them to demonstrate.

We need to select, train and expose our leaders to industry best practices, be aware of corporate governance and risk management areas so that we are not ignorant of the demands of stakeholders today. After the Enron scandal, control measures have been tightened for corporate companies to prevent them from repeating these mistakes and the leadership plays a critical role in making this a success.

3.8.5 Teamwork and Collaboration

Another key challenge is the willingness and ability of our people to work collaboratively together as a team.

Definition of Teamwork

The business dictionary defines teamwork as the process of working collaboratively with a group of people in order to achieve a goal. It was also stated that "Teamwork means that people will try to cooperate, using their individual skills and providing constructive feedback, despite any personal conflict between individuals."³

Teamwork is defined by Scarnati²¹ "as a cooperative process that allows ordinary people to achieve extraordinary results". Harris and Harris (1973)²² explained that a team has a common goal or purpose where team members can develop effective, mutual relationships to achieve team goals.

Teamwork skills include the mix of interactive, interpersonal, problem-solving and communication skills needed by a group of people working on a common task, in complementary roles, towards a common goal whose outcomes are greater than those possible by any one person working independently (Griffith Institute of Higher Education, 2010)²³.

ORGANISATIONAL AND ACADEMIC TEAMWORK

Organisational Teamwork

The value of organisational teamwork was highlighted in books in the 1980s^{24,25} while in the real world teamwork was considered "nice" but not critical for the success of corporations. Towards the end of that decade, teamwork gained importance when it was regarded by public and private sector leaders as beneficial to achieve effective programmes.

The IMU adopted the first Partner Medical School programme in 1992 which allowed the students to start their education in Malaysia while completing and earning a degree at an international university. The existence and the success of the IMU model can be attributed mainly to the

teamwork and effective collaboration within the IMU and between IMU and its partners all over the world.

Academic Teamwork

The roles and values of teamwork within academia in general and health education in particular are important and significant. Collaborative practice amongst healthcare professionals must be based on a status-equal basis between the various team members²⁶. Knowledge sharing between various healthcare professionals was also identified as beneficial to patient care²⁷. The IMU model considers all specialities and disciplines as equal and this encourages both the students and the staff learning together and sharing knowledge to achieve better outcomes for patients. The informal and relaxed atmosphere created within the work environment is integral for effective teamwork and creativity in solving problems²⁸. The IMU conducts shared activities for staff from various disciplines of academics and non-academics, to provide an informal climate for employees to get to know each other and develop collaborative relationship.

Attributes of Effective Teamwork

Attributes that are required for successful teamwork include the commitment to team success and having shared goals, interdependence where individuals depend on each other to achieve goals, interpersonal skills including honesty, trustworthiness and openness in addition to fostering a caring working environment. Open communication and positive feedback were also identified as an important attribute to successful teamwork. In teams, members feel a sense of ownership; they collaborate together and use their skills to complement each other. They accept and appreciate diversity, try to participate equally in making decisions but understand clearly the role of a team leader²⁹⁻³³.



Teamwork in IMU

Based on the social-motivation theory, being part of a team is motivating as members work towards common goals³⁴. Since the 1990's, the Ministry of Health of Malaysia has promoted three elements; caring, teamwork and professionalism. Teamwork plays an integral part in the health care setup to ensure better outcomes for patients. Teamwork is a way of life in the IMU. Students get exposed to working in teams from their first right through to their final semesters. Examples include problem-based and task-based community family case studies (CFCs), clinical groups, community services, sports events and social events (PEAC Report, 2012)³⁵.

3.8.6 Employee Engagement

The success of the IMU depends largely on the commitment, passion and perseverance of our employees to make things happen. An engaged employee will go the extra mile for the organisation, even without expectation of compensation for putting in the extra hours. Of course work-life balance is an important aspect for employees to be more productive but at times employees are required to sacrifice personal time to

respond to the needs of others. With passion and tenacity, we should never give up and ensure we deliver the tasks with quality and care. This is what differentiates the IMU from others, our service above self.

One of the major challenges is having our employees feel engaged with the organisation, that they love their jobs and they are doing it out of passion to be the best of whatever they are doing. With this commitment, the organisation will definitely move forward. Employees need to trust the Management and on the other hand the Management must also play their role in gaining that trust. We must develop a work environment that is conducive for all as best as we could. The Management must be able to feel the needs of the employees and be fair to them, recognising and rewarding employees for the values and outcomes that they bring, giving employees the opportunity to grow with the Company and empowering them to do better. Employees need to be motivated and feel that they are instrumental in developing an IMU of the future.

3.9 Conclusion

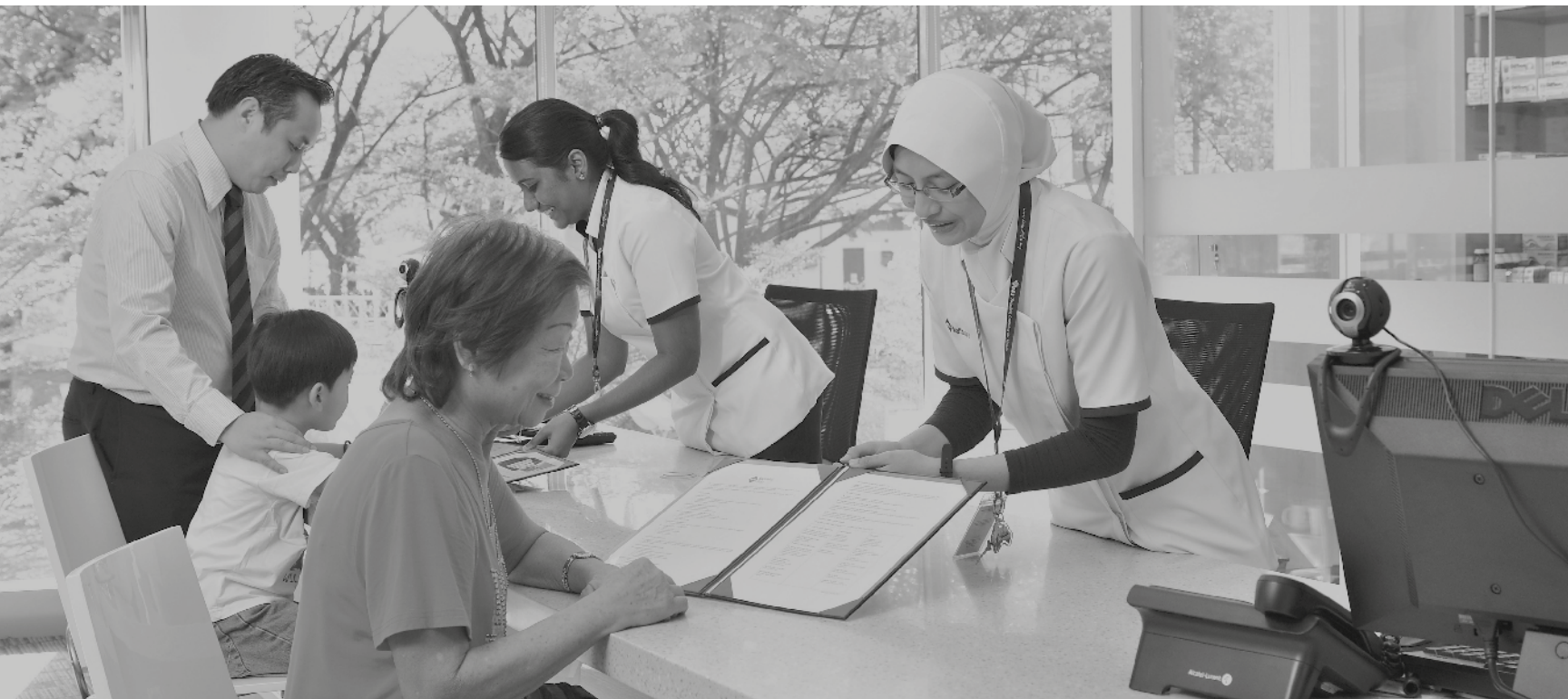
In conclusion, the IMU's value system, culture and philosophy will determine the success or failure for the organisation to achieve its vision and mission. These serve as the foundation in which the organisation is built upon. Without a strong foundation, the entire building no matter how big or strong will not hold long. It will eventually weaken and collapse. Hence, it is utmost critical for the IMU to define its value system, culture and philosophy clearly and embed these into the organisation to ensure success. Amidst the challenges ahead, with the right leadership and the right people, together we can overcome all obstacles and build a better IMU for all.

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4 DEVELOPING A LEADERSHIP FRAMEWORK FOR THE IMU

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4.1 Background

The 21st century has seen emerging challenges to the healthcare system as a result of epidemiological and demographic transitions, technological innovations, professional differentiations and population demands. These have led to glaring gaps and striking inequities in health both between and within countries¹. Healthcare systems therefore need to continually and efficiently reform to adapt to these new challenges, and meet the needs and demands of the population.

The strategic objectives of the reforms should include:

- Implementing evidence-based medicine to standardise delivery quality
- Improving organisational flow to increase volumes and revenue
- Designing patient-centred care coordination models to attract new market segments
- Encouraging new customer markets through developing state-of-the-art healthcare service
- Designing and carrying out a plan to dramatically enhance the behavioural competencies of all staff, and
- Improving operations to increase productivity and cut cost, waste, and cycle times².

Reforms in the healthcare system will inevitably have implications for health professionals in the system as well as the health professions education system that produces them. They need to be aligned around a common goal: doing what's right for patients³, and pivotal in achieving this goal is leadership⁴.

Leadership is usually understood in relation to the behaviour of an individual and their relationship to their followers, resulting in an emphasis on the behaviour, characteristics and actions of leaders. Leaders are expected to develop a vision that sets the organisation's

direction. Vision statements identify the organisation's core capabilities, defines the domain in which it will operate, specifies its customer relationship, and details the strategic direction of the company. They provide explicit directions to the team members but leave enough room for innovation and management initiatives⁵, continuity and change management^{6,7}. Organisations that do not take the time to develop their visions and missions are often ineffective.

To maintain performance, organisations need to adapt to their changing environments. They have to learn how to adapt to changes in the diversity of their workforce and customers as well as to the changing demands for social responsibility⁸. As organisations adapt, their leadership will also have to change; leaders must become change agents⁹.

This Chapter examines leadership practices in both the healthcare system and the health professions education system with particular reference to the International Medical University (IMU) as a provider of health professions education, and proposes a leadership framework for organisational development at the IMU.

4.2. Concepts of Leadership

4.2.1 Transformational and Transactional Leadership

Leaders may broadly be identified as transformational or transactional. Transformational leaders are visionary and enthusiastic, with an inherent ability to motivate subordinates, raise their awareness about what is important and increase their concerns for achievement, self-actualisation and ideals¹⁰. They move followers to go beyond their own self-interests for the good of their organisation. One learns to be a transformational leader by role modelling. The role model inspires, challenges and motivates team members, who in turn begin to be encouraged to think creatively and to develop

problem solving skills¹¹. Transformational leadership and mentoring have quite similar elements¹². Transformational leadership consists of a relationship between supervisor and supervisee, and mentoring consists of a relationship between mentor and mentee. The supervisor and mentor usually have personality traits, e.g. charisma, influence, skills, knowledge and expertise that allow them to be an effective role model for the supervisee or mentee. The supervisee and mentee, on the other hand, have high regards and respect for their supervisor or mentor, and possesses an attitude of willingness to learn and to take on responsibilities¹³. By encouraging an environment for leaders to develop leaders, teamwork within the organisation will be promoted. No leaders can have followers without a close working relationship. Similarly, no followers will follow a leader who is not engaging in their work.

Transactional leaders are said to be 'instrumental' and frequently focus on exchanging relationships with their subordinates¹⁴ to cater to the self-interests of their constituencies by means of contingent reinforcement, positive in the case of constructive rewards, praise and promises for constituents' success in meeting commitments¹⁵. The reinforcement may be aversive, such as negative feedback, reproof, or disciplinary action in the case of followers' failure to meet commitments¹⁶.

It has been theorised that transformational leadership is more closely linked to superior organisational performance.

4.2.2 Shared Leadership

However, it is becoming ever more clear that no one person can be an expert on all aspects of the work that need to be done¹⁷, especially in the current context of rapid socio-economic and technological changes that characterise the 21st century. Successful organisations will need to increasingly rely on highly independent, knowledgeable

individuals working as part of multi-disciplinary teams. The concept of shared or distributed leadership has been proposed as essential for managing these changes.

The term, 'shared leadership' is often used interchangeably with 'distributed leadership', 'collective leadership', 'horizontal leadership', and 'team leadership'. In a review of the literature on shared leadership, Koccolowski (2010)⁴ noted that most of the studies retrieved fell in the domains of healthcare and education. The review suggests that shared leadership may be referred to as a "relational, collaborative leadership process or phenomenon involving teams or groups that mutually influence one another and collectively share duties and responsibilities otherwise relegated to a single, central leader". Elsewhere, it has been defined as "a dynamic interactive influencing process among individuals in groups for which the objective is to lead one another to the achievement of group or organisational goals or both"¹⁸. Shared or distributed leadership is first and foremost about leadership practice rather than leaders or their roles, functions, routines, and structures¹⁹.

The concept that leadership is not restricted to people who hold designated leadership positions²⁰, and that acts of leadership can come from anyone in the organisation emphasises the responsibility of all staff in demonstrating appropriate behaviours, in seeking to contribute to the leadership process and to develop and empower the leadership capacity of colleagues²¹.

Such a concept of leadership has evolved from the recognition that no one individual can save a company from mediocre performance, and no one individual, no matter how gifted a leader, can be right all the time²². Enterprises that are dependent on the traditional hierarchical model of one leader at the top run a considerable risk; if that individual retires, leaves (or dies in office), the organisation may well lose its continuing capacity to succeed.

According to Kocolowski's review⁴, shared leadership is characterised by:

- Resolution of differences within the team to reach agreement
- Distribution of work to take advantage of members' unique skills
- Sharing of information and strategy about the organisation
- Promotion of teamwork within the team itself
- Working together to identify opportunities to improve productivity and efficiency

In order to empower team leadership, it is proposed that team leaders should delegate enough autonomy and responsibility to all members in their team, involve their team in decision making, and encourage their team to self-manage its performance. Further, emerging leadership teams become effective only when they are characterised by:

- Shared strategic goals
- Extensive networks
- Collaborative relationships
- Effective information processing, and
- Focussed action

Walmsley and Brown²³ defined shared leadership in the context of clinical team working as characterised by:

- A shared vision
- A clear strategy and plans for implementation
- Joint accountability for progress
- A recognised leader, but with shared responsibility for outcomes
- The lack of dependency on one or two key individuals
- Well-identified key stakeholders and means by which they keep in touch

4.3 Leadership in Healthcare

In healthcare organisations leaders are responsible for the strategic and operational planning of the services they provide. This is carried out through alignment and deployment of action plans throughout the delivery system. It requires full participation of physicians along with all other levels of clinical and support operations. The leadership is expected to:

- systematically communicate their values, plans and expectations to all staff at all levels;
- periodically review all aspects of organisational performance (i.e. outcomes, customer experience, financial results, workforce experience, and organisational learning);
- use their findings to define and redefine organisational strategy and set priorities for improvement and innovation based on analysis of the expected return on investment; and
- guide the development and deployment of action plans throughout the organisation and ensure high performance by the entire workforce and all the while maintaining a positive environment for the workforce².

With the shift to team-based knowledge working (physicians and other clinical and support staff), more traditional models of leadership are being questioned. Traditionally, leadership has been conceived around the idea that one person is firmly "in charge" while the rest are simply followers—what is termed vertical leadership. However, recent research indicates that leadership can be shared by team leaders and team members—rotating to the person with the key knowledge, skills and abilities for the particular issues facing the team at any given moment. It is suggested that poor-performing teams tend to be dominated by the team leader, while high-performing teams display more dispersed leadership patterns, i.e.,

shared leadership. This is not to suggest that leadership from above is unnecessary. On the contrary, the role of the vertical leader is critical to the on-going success of the shared-leadership approach to knowledge work¹⁷.

Healthcare organisations would seem to be especially open to the introduction of shared leadership⁴. As the workload of the professionals increases, shared leadership is becoming widespread²⁴. Many hospitals have responded to the need for new forms of leadership, leading them to adopt shared governance as a means to improve outcomes. Primarily, healthcare leaders have to build a community-based leadership vision with key stakeholders who collectively share a set of assumptions about their environment²⁵.

Shared leadership is highly practical in the healthcare environment as the quality of patient care often depends on how well a diverse group of medical and administrative experts work together, and how well collective energy is mobilised²⁶. In a study of middle-level managers in Finnish social service and healthcare, Konu and Viitanen²⁷ concluded that shared leadership provides a pathway to creating uniformity in decision-making and defining responsibilities. This too is observed in the nurse-physician relationships where shared leadership is practised. The objectives of shared leadership development should centre on trust, cohesiveness, communication, and conflict resolution with:

- The facilitation of team members learning how to relate to and communicate with each other on an interpersonal basis
- The facilitation of increased levels of trust among group members
- The facilitation of increased group solidarity
- The reduction of misunderstanding among group members
- The facilitation skills necessary for preventing and resolving intra-group conflict

4.4 Leadership in Health Professions Education

The integration of modern science into the health professions education curricula has produced health professionals with the knowledge that contributed to the doubling of life span during the 20th century. By the beginning of the 21st century, health systems worldwide have become more complex and costly, placing additional demands on health workers. Health professions education has to keep pace with these challenges, and reforms of educational programmes are needed in order to produce well-trained graduates to face the challenges of today as well as the future. These reforms should be guided by two proposed outcomes: transformative learning and interdependence in education.

Transformative learning is about developing leadership attributes; its purpose is to produce enlightened change agents. As a valued outcome, transformative learning involves three fundamental shifts:

- from fact memorisation to searching, analysis, and synthesis of information for decision making;
- from seeking professional credentials to achieving core competencies for effective teamwork in health systems; and
- from non-critical adoption of educational models to creative adaptation of global resources to address local priorities.

Interdependence is a key element in a systems approach because it underscores the ways in which various components interact with each other. As a desirable outcome, interdependence in education also involves three fundamental shifts:

- from isolated to harmonised education and health systems;
- from stand alone institutions to networks, alliances, and consortia; and

- from inward-looking institutional preoccupations to harnessing global flows of educational content, teaching resources, and innovations.

Effective leadership is essential for these reforms to take place. The broad engagement of leaders at all levels, local, national, and global, is crucial in achieving the proposed reforms and outcomes. Leadership has to come from within the academic and professional communities, but it must be backed by political leaders in government and society as it also requires a substantial expansion of investments in health professional education from all sources, an effective stewardship mechanism and the provision for shared learning by supporting metrics, evaluation and research¹.

4.5 Student Leadership

Preparing future leaders in the health professions should begin early. Undergraduate education is an ideal setting to lay the foundation for these leadership competencies. The environment in which today's graduates will be practising healthcare will be different to that of their predecessors. Individual professional autonomy has been replaced to some extent by interdisciplinary and inter-professional care, demanding better teamwork and communication¹². Nevertheless, physicians will continue to function in leadership roles in healthcare teams and are considered to be ultimately responsible for the overall outcomes of patient care. The Institute of Medicine recommends that academic health centres "develop leaders at all levels who can manage the organisational and systems changes necessary to improve health through innovation in health professions education, patient care, and research", and this is echoed by the Academy of Royal Medical Colleges to include undergraduates¹⁸.

For an undergraduate leadership curriculum, emotional intelligence, confidence, humility and creativity have been

identified as necessary qualities of leaders; while teamwork, communication, management and quality improvement as necessary knowledge and skills. In the study about leadership curriculum in undergraduate medical education, Varkey et al²⁸. reported that students perceived themselves as somewhat or fully competent in communication, conflict resolution and time management, but reported minimal or no knowledge or competence in management and quality improvement, indicating the gaps that need to be filled in the undergraduate medical curriculum in training future healthcare leaders. An explicit leadership curriculum including role play, team training, community experiences, student leadership opportunities, participation in quality improvement projects and mentored leadership development plans are some of the potential methods to enhance leadership training in undergraduate medical education²⁹. While experiential training has been perceived as the most effective for teaching leadership skills, the present day students in health professions are armed with a set of additional skills and resources different from their predecessors. Online resources, free or inexpensive web-based tools and meeting platforms permit new and high quality means of communication that can be utilised in their learning and leadership skills development.

4.6 Situational Analysis

This section describes how leadership is perceived at the IMU.

4.6.1 Leadership at the IMU

Staff's perception of leadership at the IMU can best be inferred from the results of the DLOQ survey that was carried out in Sept 2012. The DLOQ assesses the degree to which an organisation perceives it meets the qualities of a learning organisation. Some of the questions in the questionnaire assess the values of a learning organisation that are also consistent with shared leadership. It consists of 43 items, each rated on a 6-point scale, where [1] refers to

a practice which rarely or never occur, and [6] to a practice which is almost always true of your department or work group. The results are summarised in Figure 1. The overall mean score was 3.58.

Values such as commitment to truth and enquiry, and trust are indicated as being highly important components of a culture which encourages shared leadership³⁰. According to the DLOQ survey results (Figure 4.1), IMU staff perceived less positively the promotion of inquiry and dialogue, such as ‘giving open and honest feedback to each other’ or ‘encouraged to ask why regardless of rank’. It is thought that without inquiry and dialogue, open exchange of ideas is suppressed.

Taking calculated risks in pursuit of organisational goals is considered a desirable value for shared leadership³⁰, but this is not perceived at the IMU to be supported (Figure 4.1). An overcautious culture leads to conservative behaviour and unwillingness to experiment with new ideas, making it difficult for people to work without going through layers

of management for consultation and permission. Work patterns are inflexible and do not encourage employees to design their work in ways that are satisfying and more intrinsically rewarding. People are discouraged from stepping outside the box in the way that they think about and perform their work.

Collaboration and team-working is often cited as the cornerstone of shared leadership⁴. According to the DLOQ survey results, perception of collaboration and team-working, for example, freedom of teams to rethink their mandates or explore ideas that may take them off task, is relatively neutral (Figure 4.2).

The DLOQ’s domain on ‘Strategic leadership for learning’ was perceived positively by staff (Figure 4.2). However, the items have been phrased in such a way as to assume the traditional model of hierarchical leadership. For example, in the IMU, ‘leaders’ are perceived to ‘ensure that the organisation’s actions are consistent with its values’, suggesting centralised responsibility.



Figure 4.1 Summary results of the DLOQ survey carried out at the IMU in September 2012.

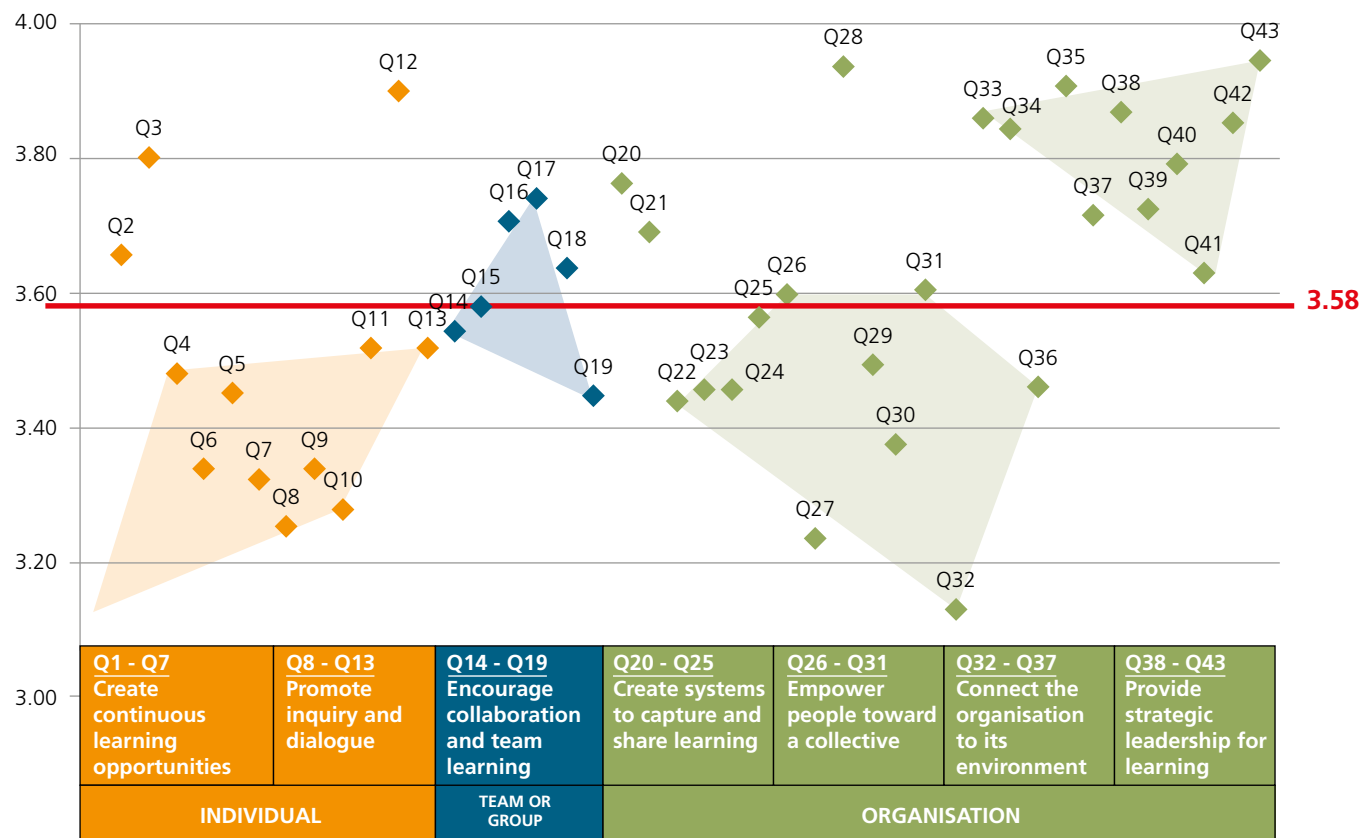


Figure 4.2 Summary results of the DLOQ survey (by questions) of IMU staff carried out in September 2012.

4.6.2 Student Leadership at the IMU

Presently, the student leadership curriculum in the IMU remains a hidden curriculum. Nevertheless, many of the potential methods to enhance the leadership qualities in undergraduate health professional education as proposed by Varkey et al. (2009)²⁸ are being held in the IMU on a regular basis. Notable mentions include:

- Student engagement in matters related to their training. In the IMU, students are empowered to express their views on matters which affect student life at the University, including academic, student welfare and co-curriculum activities. The student engagement in the

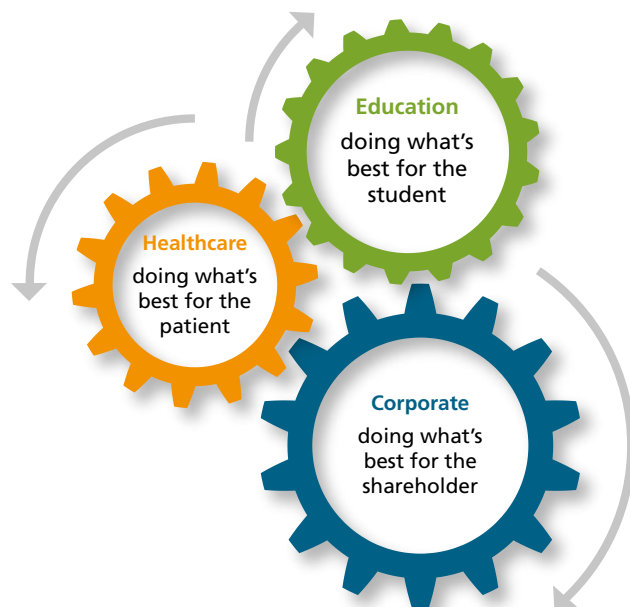
matters of their training has been recognised by the AMEE where recently the IMU has been awarded the AMEE - ASPIRE for EXCELLENCE award in the area of Student Engagement.

- Involvement in community projects in leadership roles is an essential part of their training. These projects enable the students to serve the community, experience team-working and nurture their leadership qualities. Again, one of the community projects by the IMU has won the First Place in the MacJannet Prize for Global Citizenship for the Community Service provided to the Orang Asli community in Negeri Sembilan.

The IMU supports an atmosphere where students can openly share ideas, interests, and concerns. Through involvement with co-curricular activities and attendance in programmes organised by student groups, students can develop their skills, knowledge, attitudes, and behaviours in regards to leadership qualities, ethics and professionalism, and other soft skills. Involvement in these activities plays an important and complementary role to learning in the classroom and the IMU strongly supports student creation of and involvement in organisations.

4.7 Conclusions and Recommendations

As an organisation, the IMU is a body of three closely knitted primary structures, each with a clear primary goal:



A progressive leadership framework is pivotal for IMU's success in the corporate, healthcare and education arenas. Current thinking would suggest that embracing shared leadership is the way forward. For this to take place, certain key guiding principles^{30, 31}, must be observed:

- **Humility** – no one individual can perform all aspects of work that need to be done
- **Equity** – each individual has his/her unique knowledge and skills, and there must be mutual recognition of the unique contribution of each individual
- **Partnership** – all individuals therefore need to work together with mutual respect and trust
- **Ownership** – within the team they must be capable of making personal commitment to the outcomes of their work and to the mission of the team
- **Accountability** – all individuals must own the consequences for actions that are inherent in their role

Underpinning these principles should be an organisational culture based on³⁰:

- **Mutual respect** – We respect that each individual has unique skills to lead this mission
- **Trust** – We trust that each of us will fulfil our role
- **Unity** – We remain united in our mission in the face of conflict
- **Commitment to truth and enquiry** – We are committed to the truth and will enquire to seek it
- **Openness** – We are open to each other's ideas, thoughts and feelings
- **Risk-taking** – We support taking calculated risks in pursuit of organisational goals

As these values permeate the whole organisation, leadership can be developed so that it is evident and recognised at all levels. Developing leadership at all levels promotes the ability to respond to the rapid, even

disruptive changes that are the reality of today’s operating environment. It is also the case that the larger, more complex and global an organisation is, the more it needs to embrace the principle of leadership at all levels. This is a challenge to the idea that leadership and management are hierarchical; typically that leaders are more ‘senior’ in an organisation than managers. This principle, therefore, can be contentious in that it challenges many assumptions about authority, guardianship of knowledge and expertise.

Leadership at all levels is more relevant to today’s matrixed, complex and fast moving organisations. It increases the leadership capacity in an organisation to execute complex and stretching strategies. The concept of leadership at all levels opens up many more opportunities for engagement, innovation, talent management and in overall terms, operating effectively in the reality of today.

We propose a leadership framework based on the concept of shared or distributed leadership. The central aim of the framework is to support the achievement of IMU’s primary goals of doing what is right for the patient, doing what is right for the student, and doing what is right for the shareholder. We propose devolution of responsibility and assumption of ownership and accountability in acknowledgement of the unique skills and expertise individuals bring. We further propose that shared leadership is developed by equitable distribution of responsibility based on knowledge and skills, with individuals working in partnerships to achieve the common goals.

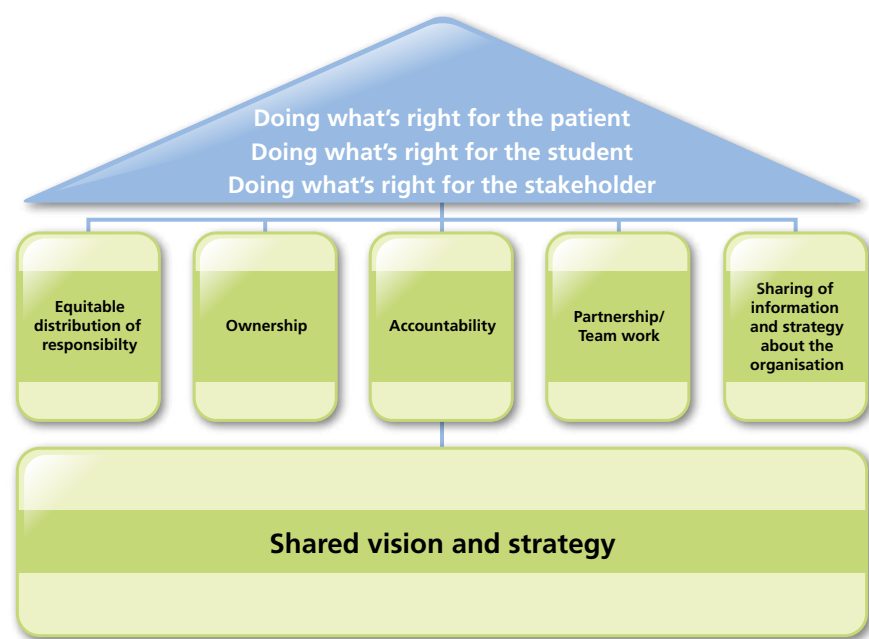


Figure 4.3 Leadership Framework

We make the following recommendations to support the development of shared or distributed leadership:

- Development of organisational and management structures that empower staff to assume responsibility with ownership and accountability
- Within formal forums / committees as well as spontaneous or improvised groupings, individuals or teams should have responsibility for certain aspects of the agenda
- Multi-disciplinary and inter-professional working in order to take advantage of the unique skills and talents of all staff
- Development of communication and inter-personal skills to support effective teamwork and working in partnership
- Development of emotional intelligence and conflict resolution skills to enable effective working in partnerships and teams

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BIOETHICS AND PROFESSIONALISM AT THE IMU

50

The IMU Experiment

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5.1 Introduction

This chapter provides insights on the strengths and weaknesses on the teaching and assessment of professionalism and bioethics in the IMU. Strategies are suggested on how to enhance professionalism in all stakeholders in the organisation and to align with the core values which are enshrined within the acronym TRUST: trustworthy, responsive, unity, service, and tenacity. The core values are central to the IMU and linked to the vision and mission of the organisation.

5.1.1 A Glossary of Definitions

For the purposes of this document, the following definitions need to be clarified:

Ethics: The field of ethics (or moral philosophy) involves systematising, defending, and recommending concepts of right and wrong behaviour (Anscombe, 1981).

Medical ethics: The term “ethical” is used to refer to matters involving (1) moral principles or practices and (2) matters of social policy involving issues of morality in the practice of medicine. The term “unethical” is used to refer to professional conduct which fails to conform to these moral standards or policies (American Medical Association, n.d.).

Bioethics: Bioethics is a relatively new word coined by the biochemist Van Rensselaer Potter in 1970 to draw attention to the fact that the rapid advances in science had proceeded without due attention being paid to values. The word bioethics, using two Greek words, *bíos* – meaning life – representing the facts of life and life sciences, and *éthos* - meaning morals – referring to values and duties (Potter, 1971). Bioethics should not be confused with medical ethics, which is only one of its branches.

The field of bioethics is as wide as the facts of life, and its study is divided into many branches, each one with its specificity: Ecological or environmental bioethics, Medical bioethics, Clinical bioethics.

The idea of Potter, and in general of bioethics, is that not all that is technically possible is morally right, and that some control of our intervention in nature and the environment, on animals and on human beings, is needed. Global bioethics is bioethics involving all actual human beings, future human beings and all living organisms and the environment.

Professionalism: Professionalism refers to the conduct, aims, or qualities that characterise or mark a profession or a professional person.

Medical professionalism: Refers to the conduct, aims, or qualities that characterise or mark the profession of medicine or a medical professional. The project ‘Medical Professionalism in the New Millennium: A Physician Charter’ defines professionalism as the basis of medicine’s contract with society (Medical Professionalism Project: ABIM Foundation, 2002). ‘It demands placing the interests of patients above those of the physician, setting and maintaining standards of competence and integrity, and providing expert advice to society on matters of health. The principles and responsibilities of medical professionalism must be clearly understood by both the profession and society. Essential to this contract is public trust in physicians, which depends on the integrity of both individual physicians and the whole profession’. Professionalism is, therefore, directly related with ethics. Its ethical expression is called Professional Ethics.

5.1.2 Professionalism Defined

The healthcare profession in its entirety has been called to address the challenge of how it defines itself. The

challenge of defining what constitutes its profession, i.e. professionalism, has seen intense debate for some time. The World Medical Association has issued several statements pertaining to bioethics over the last 35 years. The American Board of Internal Medicine (ABIM), Society of Academic Emergency Medicine, the Accreditation Council on Graduate Medical Education (ACGME), American College of Physicians and American Society of Internal Medicine (ACP-ASIM), the General Medical Council (GMC), the Royal College of Physicians (RCP) and the European Federation of Internal Medicine (EFIM) have tried defining professionalism (ABIM, 1994; 2002; Van Mook et al., 2009; GMC, 2013; RCP, 2005; Kirk, 2007).

Van Mook *et. al.* (2009) defined medical professionalism as “the ability to meet the relationship-centred expectations required to practice medicine competently.” The RCP defined medical professionalism as a set of values, behaviours, and relationships that underpin the trust the public has in doctors – this definition, they assert, can apply to other healthcare professionals as well (RCP, 2005). The King’s Fund (Rosen & Dewar, 2004) called for professionalism to put patient’s interests back at the centre of care. They also assert that stakeholder parties should be facilitated to have open and responsive discussion regarding professional standards relevant to prevailing values and expectations. Meanwhile, the Picker Institute Europe looked at patient-centred professionalism, which they defined as “doctors fulfilling their changing (and in some cases unchanging) roles in ways which coincide with changing (or unchanging) patient roles, as well as working with patients and others to see whether areas of conflict can be eased” (Askham & Chisholm, 2006). The well-known Physician Charter (Medical Professionalism Project: ABIM Foundation, 2002) reiterates professionalism on three principles: primacy of patient welfare, patient autonomy, and social justice and ten responsibilities: professional competence, honesty, confidentiality, appropriate relationship with patients,

improving quality of care, improving access, equity, integrity of scientific knowledge, maintaining trust and managing conflicts of interest, and professional responsibilities. Society and the community stand to gain from ethical and professional practice.

5.1.3 Factors That Influence or Hinder the Evolution of Professionalism

5.1.3.1 The Changing Global Landscape

The varied opinions on professionalism are probably a reflection of the changing global landscape. Events of recent years have seen widespread political instability, wars, and economic downturn. Healthcare provision is challenged with limited resources, rising costs, and an ageing population. Communicable diseases like HIV and AIDS, malaria, tuberculosis, influenza, and polio remain serious global concerns [World Health Organisation (WHO), 2009 & United Nations (UN), 2012]. There is an increasing emphasis on non-communicable diseases, e.g. cancers, cardiovascular diseases, chronic respiratory diseases, and diabetes (WHO, 2009; UN, 2012). Globalisation of mass media, urbanisation, industrialisation, increasing access to information, consumerism, and increased migration have contributed further to widespread changes in traditional cultural norms and expectations and changes in family dynamics (Sawyer *et. al.*, 2012). Controversially, Epstein and Hundert (2002) highlighted greed as an underlying value contributing to this change.

Additionally, patient safety is increasingly important and well recognised publications from the Institute of Medicine have highlighted the scale of healthcare-related adverse events and their related consequences (Institute of Medicine, 1999). The World Alliance for Patient Safety (WHO, 2008b) showed the significant burden on mortality and morbidity from healthcare. Rising litigation is a

concern for many healthcare professionals, fuelled further by publicity of high-profile cases. Tighter regulation has been seen as a fitting response but some assert that self-regulation through professional bodies may give way for independent regulation (RCP, 2005).

Universal health coverage has been seen as essential to addressing the concerns above and allowing sustainable human and economic development (UN, 2012; WHO, 2009; Geoghegan, 2013; Ban, 2012). The WHO has called for an increasing focus on the adolescence stage of life as a pivotal period and a determinant of future health (Sawyer et al., 2012). At the same time, the United Nations put in place the Millennium Development Goals (MDG) that aim to eradicate poverty, improve maternal and child health, improve primary education, and reduce gender inequality. Such pressures have increased the desire for accountability and measurability, as well as evidenced-based output and pay-for-performance schemes in both developed and developing countries (Eichler & Levine, 2009). To this end, WHO has published a series of Health Reports looking at improving health systems financing (WHO, 2010), primary healthcare (WHO, 2008a), global public health security (WHO, 2007), the training of healthcare workers (WHO, 2006), maternal and child health (WHO, 2005), and global health risk reduction (WHO, 2002).

Healthcare research will also face many of the above challenges, initially to acquire new treatments and technologies, but also in the equitable and safe distribution of such treatments and technologies (Cash, Wikler, Saxena, & Capron, 2009). To this end, WHO will be publishing its World Health Report in August 2013 titled “Research for Universal Health Coverage?”

5.1.3.2 The Changing Doctor-Patient Relationship

Worryingly, the RCP in its 2005 report “Doctors in Society” highlighted the historically poor response the medical

profession has been in adapting to societal expectations. Further, they asserted that many skills unique to individual professions are being redistributed or reassigned and healthcare has not been spared in this (RCP, 2005). Healthcare professionals have to redefine their roles within increasingly complex health systems and in interprofessional teams and can no longer function as individuals.

The traditional paternalistic doctor-patient relationship is making way for a relationship of equal standing that involves the patient in decision making based on evidenced based recommendations (Van Mook *et. al.*, 2009). Cultural competence, empathy, good communication skills, aided by continuous professional development on the part of the professional have become essential elements in this relationship. Such a relationship builds patient satisfaction and trust. Further, it contributes to treatment adherence, and also minimises litigation and complaints (Hall *et al.*, 2002; Rowley, Baldwin, Bay & Cannula, 2000). The relationship also facilitates the professional development of healthcare providers (Swick, 2000 & Van De Camp, Vernooij-Dassen, Grol, & Bottema, 2004).

In medical education, professionalism is now considered a competency and no longer part of the “hidden” curriculum, but formally and explicitly learnt as an integral part of the curriculum (Wear & Kuczewski, 2004). Most advocates agree that personal characteristics such as altruism, empathy, accountability, excellence, duty, honour, integrity and respect for others need to be taught as they are vital in professional practice. Such soft skills are no longer considered part of the “hidden” curriculum (American Board of Internal Medicine, 2002, Wear & Kuczewski, 2004).

5.1.3.3 Formal Standards of Professionalism

Codes of conduct established by international organisations and local regulatory authorities like the Malaysian Medical

Council become measures of the standards of care. Such standards are normally visible to the public.

5.2 Role of Humanities in Medicine and Patient Care

Since antiquity, the doctor's basic toolkit comprised "the herb, the knife and the word" (Benjamin, 1984). With the advancement of technology, doctors have favoured medication and treatment procedures over the art of communication. The 'word' by the doctor, which is sorely needed by patients, is often not uttered or even carelessly spoken. The 'word' by patients, which requires listening, is often brushed aside by overwhelmed or sometimes uncaring doctors. The humanities are a study of human thoughts and experiences and involve inquiry into consciousness, values, ideas, and ideals that shape our understanding of the world. Its role is to develop and support the fulfilment of the goals of medicine (Evans, 2002).

Gordon and Evans (2010) have suggested several outcomes for the humanities:

- Help learners to develop skills in interpreting experiences
- Opportunities for students to encounter and appreciate human diversity
- Nourish a wonder of embodied human nature and embodied consciousness, leading to medical care that is, in its essence, reverential
- Help students to develop personal values
- Encourage students to take experience and subjectivity seriously
- Enable medical education to move from technical training to a genuine university education
- Help students to draw from and appreciate the reflections of others
- Help students to develop communication skills

The inclusion of medical humanities within the medical curriculum has flourished in the USA, UK, Australia, and New Zealand over the past 20 years (Goulston, 2001). Recent reforms incorporate argument-based reasoning in medical ethics, narrative-based reasoning in literature, creative reasoning in the fine arts, and historical reasoning in learning from the past to uncover hidden assumptions and biases (Doukas, McCullough & Wear, 2010). Within the Asian region, there is no evidence of a formal programme for medical humanities in the medical curriculum.

5.2.1 Is IMU Ready for the Integration of Humanities?

The IMU faculty participated in a survey to gauge the level of acceptance in integrating humanities modules in the curriculum. All programmes were represented but only 89 responses were received. Full details of the survey can be obtained on request. Overall, the majority felt integration would benefit their programme, improve students' effectiveness in caring for patients or clients, would value learning from the humanities, and accepted humanities as an important aspect of broader education.

From the 23 open responses, 46.42% had major concerns about the capability of the curriculum to include interdisciplinary studies due to credit overload. A small number also questioned the availability of trained faculty to teach the Humanities modules. The survey also collected information from first-year medical students on their orientation towards Humanities modules and received 79 responses.

5.2.2 The Way Forward

The development of modern medicine and healthcare that has been dominated by science, technology and economics has been associated with the erosion of medical ethics in the traditional sense. This has in turn led to the rise and emphasis on biomedical ethics. The following are further challenges that will be faced in moving forward:

- To encourage leadership from various levels and expertise that will be accountable for promoting the humanities, convene a working group comprised of experts to plan and strategise the integration of humanities into the learning environment and develop modules that will be able to achieve the learning outcomes of health education.
- To ensure that all staff understand the vision and mission of the university, training on medical humanities should be provided.
- To ensure continuity and depth by developing a structured programme requiring students to complete assignments in humanities with a specific focus on topics related to ethics and professionalism over a 5-year period, and to compile a list of recommended books and films to be used in the learning of Ethics and Professionalism modules.
- Establish a narrative medicine programme
- To meet the vision of educating students to appreciate the value of caring, to meet the education philosophy of learning by doing and, to learn by serving the community.
- Engage in interprofessional learning research to identify ways students' learning can be facilitated and enhanced to enable confident transition to workplace.
- Events like the White Coat Ceremony, involvement in Community and Family Case Studies (CFCS) and the IMU Cares projects have provided opportunities for students to improve their skills in this area.
- The adoption of the UNESCO Core Curriculum for Medicine has been accepted for delivery through incorporation into the existing curriculum
- The teaching has been formalised into the curriculum where the content, delivery and assessment methods are made explicit.
- The curriculum for P&B across the IMU is designed to align with the multiple roles that future healthcare professionals are expected to perform.
- The learning is stage and content specific. Junior students learn the fundamentals of P&B where the delivery methods are mostly via lectures, small group sessions and simulated clinical experiences. Senior students, learn advanced skills in authentic clinical situations. Different schools identify the specific competencies for the respective profession and design their curriculum accordingly. Across the IMU, interprofessional learning is being utilised to provide authentic professional experiences.
- As the IMU has outcome based curricula, P&B teaching cannot be a stand alone subject but needs to be threaded through contextual learning with incorporation of patient safety issues and medical law being integral to professional practice.
- Assessment is also stage specific, with higher orders of learning according to Miller's pyramid as student's progress. Where applicable, the 360 degree assessment is performed. The assessment is both formative and summative. Direct observation of behaviours and multisource feedbacks from faculty, nurse educators, peers and patients are among the methods used.

5.3 Implementation of the Teaching of Professionalism and Bioethics in the IMU

The implementation of Professionalism and Bioethics (P&B) has occurred in the following ways:

- It is embedded in the curricula across the IMU. It is one of the eight domains in the IMU spiral curriculum.
- Workshops and an International Conference on Bioethics in 2013 has sensitised the learning of P&B in the IMU.

5.3.1 School of Medicine

During the first 5 semesters of the Medical Programme, aspects of professionalism and ethics are taught in the form of plenaries, case discussions and debates. Students are assessed through a written exam at the end of the semester. The curriculum content for Phase 1 has been criticised for focusing too much on the theoretical aspects of the subject. Students may not have the maturity to appreciate the significance of subjects discussed considering their limited exposure at this stage.

During Semesters 6 through 10, students follow the UNESCO Bioethics Module. Students are assessed through observation on their attitude and team working abilities, how they deal with criticism, communication skills, lifelong learning skills, humanistic values, empathy, and professional approach to patients. Log books, Objective Structured Clinical Examinations (OSCEs), student medical research, community service (IMU Cares), CFCS, and portfolio discussions are areas of further learning.

The contents of P&B from Semesters 6 to 10 are adequate and appropriate for this stage of their training. However, faculty members have to play a bigger role in the teaching and learning activities to guide and facilitate learning. Faculty must be competent in formative assessment and giving effective feedback. The following are the recommendations for the School of Medicine:

- Focus on more generic principles of P&B practice in Semesters 1 to 5 and learn specific/discipline-based issues in the clinical phase.
- To invite experts in medical ethics and law to deliver plenaries
- To have more case-based discussions (instead of plenaries) to promote students' participation. Clinical School faculty would facilitate the discussions.

- Faculty training to facilitate student's learning, give effective feedback, and be effective role models
- To incorporate humanities, medical law and patient safety issues appropriately.

5.3.2 School of Dentistry

The Dentistry P&B curriculum is an organised curriculum with learning outcomes and competencies spread throughout the curriculum. The School of Dentistry P&B curriculum is based on the American Association of Dentistry and Malaysian Dental Association principles of ethics and code of professional conducts. The curriculum is spread over 9 semesters. The Professional Practice Assessment is used as a tool to assess the students and helps them reflect on their strengths and weaknesses.

There are four qualities that have been covered in the P&B dentistry curriculum: (1) respect for human beings; (2) competency; (3) integrity; and (4) primary concern for service. The following are the recommendations for the School of Dentistry:

- P&B should be treated as a reasoned discipline in its own right and not simply as either abstract good heartedness or unquestioning devotion to code of conduct.
- The dentistry P&B curriculum should not be strictly theoretical, but based on the analysis of cases oriented to the delivery of healthcare and to the practice of dentistry.
- The enhancement of ethical decision-making skills should take place within the classroom and clinics. Discussion of specific cases encountered by students is beneficial in preparing students to reflect critically on their own practice.
- The IMU School of Dentistry learning curriculum should lead to graduates having a greater understanding and expanded experience in P&B, interpersonal

communication, respect and empathy as these relate to professional dental practice.

- Incorporating humanities into the undergraduate curriculum should lead to higher levels of postgraduate professionalism, increased patient trust, and stronger partnerships with our alumni.

5.3.3 School of Pharmacy

P&B is implemented in the School of Pharmacy in the following ways:

- Symbolic Oath of Professionalism
- The Curriculum:
 - Specific Topics and Delivery Methods: Professionalism and ethics are introduced in B Pharm (Hons) programme from Semesters 1 through 5.
 - P&B is a core part of skill based teaching and learning activities e.g. Pharmacy Skill Development (PSD) sessions, OSCEs, practicals, extemporaneous dispensing, hospital and community placements etc.
 - Feedback on ethical and professional aspects is taken from preceptors during students' hospital and community placements. Similarly these aspects are assessed during various individual as well as group presentations.

5.3.4 School of Health Sciences

The School of Health Sciences consist of programmes that are laboratory based (Medical Biotechnology & Biomedical Science), healthcare-related (Psychology, Nursing, Nutrition and Nutrition & Dietetics), and Complementary Healthcare (Chinese Medicine, and Chiropractic).

All the programmes teach a module of P&B delivered as plenaries with case discussions and presentations. Assessment takes place via end of semester written exams.

In the laboratory based programmes professional behaviour is assessed formatively during industrial placements and conduct of research. There is summative assessment in practical exams. In programmes where there is patient contact (Nursing, Dietetics with Nutrition, Chinese Medicine, and Chiropractic) professionalism and ethics are embedded in the clinical and hospital placement trainings. Assessments are then carried out formatively through observation of professional behaviour and through reflective diaries.

5.4 Results of the SWOT Analysis of Professionalism and Bioethics in the IMU

The authors performed a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis (Casebeer, 1993) on aspects of P&B in each programme in the IMU. Key findings from the analysis are summarised below.

- **Admissions** – perhaps lack of discrimination in P&B aspects in the admission processes. A more stringent interview process may be required. Some programmes inculcate P&B in the early stages e.g. white coat ceremony, oath taking ceremony, and peer mentoring.
- **Curriculum and Curriculum Delivery** – aspects of P&B are integrated but need faculty training, time, and buy-in. Training needs to be more contextual and relevant to real-life practice. Delivery methods vary between plenaries, small group teaching, portfolio learning and web resources. Delivery methods struggle for lack of facilitator skill, time and adequate role models. Some programmes struggle with poor student awareness and engagement, teacher-centered learning, and poor inter-programme interaction.
- **Assessment** – currently a mix of formative and summative assessments, but current methods do not reflect real attitude and behaviour. Faculty members lack the experience, expertise, and time to assess students

adequately. Assessment of this area is often given lower priority by students and faculty in place of other traditionally core areas.

- **Management Processes Where the Student is a Stakeholder** – most students are aware of processes within their curriculum and have the opportunity to provide feedback on their experiences. There are concerns about the transparency of the selection process for partner schools in some programmes.
- **Faculty Behaviour** – faculty members are good role models with few exceptions, but there needs to be greater awareness of aspects pertaining to P&B. Opportunities exist to appoint key faculty members to spearhead improvements in this area.

The authors also performed a survey looking at the teaching of bioethics and professionalism in the IMU. The full results are available on request. The following are the main findings from the respondents:

- Majority of respondents thought that teaching in P&B was absent in their respective programmes. There was variation on their perception of when and who delivered the teaching.
- Most respondents agreed the current curriculum is producing minor behaviour change and a more formal teaching programme was required. Most respondents (75%) have not accessed the e-learning resources available.
- 57% of respondents have not received any formal training in P&B (most are in Bukit Jalil), and those who had received training received it from workshops, seminars, and short courses.
- Responders felt their knowledge on bioethics was lowest in the areas of end-of-life care, human reproduction, substitute decision making, and resource allocation training. Only 22% of respondents felt confident about teaching P&B

and 47% felt they were able to with additional resources.

- In terms of respondent's priority for more education, these were highest in research publication, learner-supervisor relationship, relationship with colleagues, justice, research ethics, responding to cultural differences, and assessment of capacity/competence.
- Most respondents were in favor of integrating humanities, but faculty were concerned about sufficient faculty members and training to successfully achieve this.

5.5 Institutionalisation of Professionalism and Bioethics into the IMU's Culture

Action Plan

The concept of professionalism is intrinsically scientific, clinical, ethical and social. To institutionalise the culture of P&B within IMU, all stakeholders will have to play their role effectively, from the highest level of leaders to the ground level staff. The IMU Core Values serves as a useful guide for this purpose. The following are key areas to consider:

- For students, the teaching of P&B should be on the best evidence available.
- The P&B activities are to be spiralled through the whole period of their training.
- Use interprofessional learning to provide authentic clinical experiences.
- Define the roles of faculty members clearly and train them accordingly. To enable the faculty to play these roles effectively, strategies for faculty training and development need to be put in place. The institution can help by:
 - Developing a specific faculty development programme for this subject.
 - Establish a faculty evaluation programme with clear criteria for performance evaluation in this subject.

- Change the environment to support faculty roles (e.g. organisational development, curricular reform, clerical and technical support, research assistance and faculty reward system).
- Promote and facilitate the organising of IMU Cares projects.

5.6 The Way forward

The following are further challenges that will be faced in moving forward:

- **Faculty buy-in:** the results of the SWOT analysis showed that many of the faculty need to be trained further, particularly in the teaching and assessment of P&B.
- **Curriculum** – what is the best form of assessment? What is the ideal way to teach – lectures or clinical situations?
- Using inter-professional learning is challenging – bringing two different groups of students together is logistically difficult and discussions may not be relevant to all groups present.
- **Staff recognition** – should recognition be given for staff involvement in P&B?
- **Role Models** – finding the right role model within different disciplines; faculty from the IMU also come from different cultures around the world.
- **Faculty training** – difficulty in scheduling such training due to the vast amount of cross teaching involved, especially with the Teacher Information Management System (TIMS) that automatically schedules staff for their teaching and learning activities.
- **Student Recruitment** – currently only medical and dental students undergo an interview whereby they are presented with scenarios which test their decision making skills. This may soon be surpassed by the Multiple Mini Interviews. There is no comparable selection process for all other programmes in the IMU, should this change?
- How does one transform values to behaviour? How does one interpret a person's values based on their behaviour? It is impossible to know a person's true attitude based on their behaviour (or lack of it). The following are additional concerns that need to be appropriately addressed before implementation of teaching of bioethics in the IMU
- Who should be teaching bioethics to the faculty? Can an expert from one field teach other experts in other fields? Would the examples be applicable and consistent?
- Since each discipline has its own set of rules and regulations that govern the conduct of their members, are ethical standards of behaviour standardised across disciplines? Or does each discipline focus on different perspectives?
- **Monitoring and evaluation** – who should be monitoring the implementation of bioethics in the IMU curriculum and how can they assess whether the students are meeting the learning outcome?
- In addition, at what level should the implementation of bioethics be done? At the university, school, or department level? It is important to take into account the values and bioethics that differ across different professions. A one size fits all approach to teaching bioethics would not work.
- Engagement and transformation of graduates in ethical behaviour is a challenge the IMU faces. Current mechanisms do not permit evaluation of graduates of the IMU.

5.7 Conclusion and Recommendations

The challenges in teaching P&B are numerous but societal expectations are high as current professional-patient relationship necessitates the involvement of the patient (and community) in decision making. Each of the schools in the IMU has some form of P&B incorporated into the

curriculum. However, except for the School of Medicine, the Division of Nursing and School of Pharmacy there appears to be a need to develop more explicit contents that need to be incorporated into the respective curricula. The SWOT analysis clearly shows weaknesses in faculty training and expertise in delivery of P&B and recommendations for improvement are made. Apart from making the teaching of P&B explicit and implicit there appears to be a need to extend the inculcation of P&B to the corporate sector, healthcare facilities and support staff so that the culture of professionalism is infused throughout the university. Much progress has been made in providing opportunities to exhibit caring and humanism by way of formal classes, humanism awards and the various community projects that the IMU is involved through the IMU Cares. All stakeholders have to play integral roles in making the teaching and learning of P&B a success. This requires buy-in by all members of the IMU community and would be aligned to the IMU core values.

Recommendations

- The curriculum of all Schools will incorporate teaching of P&B from the beginning of the course and adopt strategies that would result in transformation of graduates who adhere to societal expectations of being professional and ethical in practice.
- Schools that have discrete modules as part of the curricular need to look at a broader perspective for sustained effects on the graduate.
- The contents of the UNESCO Core Curriculum for medical programme should be used for content development; units that have commonality and are relevant to alignment with the core values of the organisation should apply to other health related programmes.
- Core values need to be internalised through existing opportunities and encounters.
- The development of expertise in teaching professionalism, bioethics, humanism, medical law, and patient safety is required through formalised programmes. The training of bioethics should be compatible with local societal and cultural values, and not limited to what is deemed to be accepted international values.
- The establishment of a chair for the teaching of P&B needs to be considered for continued dynamism. A core group of experts need to be trained and licensing should be considered by the IMU's Centre for Education (ICE).
- Development of a 5-year plan: Based on literature review of programmes that have successfully implemented ethics training, it is prudent not to 're-invent the wheel' but instead learn from the experiences of others in developing a 5-year plan of implementing a standardised bioethics curriculum. Hinman (2009) presented a grid that can serve as a framework that shows how centralised ethics courses can be built upon within the curriculum to ultimately incorporate community outreach and volunteerism among students for real-world application.
- In addition, the framework by the Teaching of Engineering Ethics Working Group outlines an ethics curriculum map that lists four different levels of increasing complexity and focusses along with the suggested learning outcomes, content and processes in order to implement a workable ethics curriculum. These frameworks can serve as possible templates for the implementation of the teaching of bioethics here in the IMU. Nevertheless, the previous issues raised in this section should be addressed as much as possible first in order to be clear about the outcomes that are realistic and achievable.

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ACADEMIA AND SCHOLARSHIP AT THE IMU

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6.1 Introduction

The Scholarship of Teaching and Learning (SOTL) is an international initiative currently led by the Carnegie Foundation for the Advancement of Teaching and triggered by Ernest Boyer's *Scholarship Reconsidered* (1990). In this seminal work, Boyer elegantly articulated the SOTL as a demonstration of academic excellence in four specific areas – scholarship of discovery, of teaching and learning, of integration and of application/engagement. In fact, the scholarships of learning, service, creative artistry, judgment (assessment and evaluation) management/administration and public dissemination, have all been identified as being part of scholarly activity.

Indeed in Boyer's report on *Scholarship Reconsidered* (1990), he proposed the vision of such a scholarship that recognises the great diversity of talent within the professoriate and this may prove especially useful to faculty as they reflect on the meaning and direction of their professional lives. Boyer's typology originally identified as the Scholarship of Teaching has been expanded somewhat and is widely known today in the literature as the Scholarship of Teaching and Learning (Bosher, 2009). All faculties do engage in scholarship, though such engagement may differ in form and content and at different moments of their career or even over the academic years.

The SOTL involves research into the practices of teaching, learning and the curriculum. Therefore it largely involves asking questions about how students learn and how to best enhance their learning through effective teaching. At ground level, it means gathering and interpreting of evidence from a wide range of resource matters pertaining to the students' learning and subsequently sharing the results of the analysis publicly for purposes of peer review, knowledge sharing with colleagues and the academic

community. This SOTL cycle is a vital ingredient for the existence of a meaningful scholarship.

Teaching in itself, cannot be synonymous to "scholarship" nor is research simultaneous to "teaching," although teaching can be recognised as a scholarly work. A distinction needs to be made between teaching (activities to promote student learning), scholarly teaching (a reflection of one's knowledge about and approach to teaching and learning) and SOTL (the contributions to a developing body of knowledge about teaching and learning). Effective teachers in higher education should engage in scholarly teaching practices as a matter of course. These include staying in touch with the latest research developments in a discipline, integrating these into the curriculum (e.g. through lectures and assessment tasks) and routinely gathering student feedback (e.g. using various instruments) and using this to guide curriculum review and improvement.

The SOTL goes beyond scholarly teaching in that it emphasises the importance of analysing, documenting, sharing and publishing the results of research into students' learning. Shulman (1999) argues that scholarship becomes evident when one's research on learning and teaching is made public (e.g. through staff seminars), when it is subject to critical review and evaluation by members of one's community (e.g. in peer reviewed journals) and is used, developed by and integrated into the activities of one's academic community. For instance, colleagues may make changes to their curriculum design or assessment and feedback practices as a result of hearing about the research on learning and teaching.

The SOTL and the idea that a faculty member, not just those in education, could and possibly even should contribute to it, can extend the transformation of the nature of the roles and responsibilities of faculty members

as teachers. In brief, SOTL is about transforming and extending knowledge, interrogating the act of teaching and a process of interaction that creates new understanding – it is “the public display of the individual understandings and truths that educators have around their roles and what they do with that knowledge.” In the education arena, especially so in higher education, the SOTL plays a crucial role in enabling academics to firmly establish evidences which can be used in scholarly ways on which to make informed professional judgments in and about teaching and therefore helps in developing awareness of high quality approaches to teaching with a widened perspective.

6.2 Teaching, Learning and Research, and Service in Relation to the Vision and Mission of the IMU

The basis of academic and scholarly activities of the IMU is in its statement of vision and mission (Lim, 2013). It says that the IMU shall be an innovative global centre of excellence in learning and research, supporting a community of scholars and professionals committed to serving the society, promoting the development of students to reach their true potential in becoming competent, ethical, caring and inquiring citizens and visionary leaders. This vision is shared by all its academia and they are committed to academic freedom and the principles of equal opportunity in the pursuit and application of knowledge, the highest standards of intellectual, educational and research productivity and in establishing a learning organisation that respects the individual.

The primary mission of the IMU is to educate pre-university, undergraduate medical, dental students and allied healthcare professionals, postgraduates, and postdoctoral fellows in accordance with the highest professional standards enabling them to lead in the global settings as physicians and allied healthcare professionals, scientists and educators. We also aim to produce compassionate

and caring professionals skilled in the science and art of medicine whilst upholding ethical and social principles of the profession in meeting the needs of the community and society, using best practices by engaging in lifelong learning (Lim *et. al.*, 2013).

In order to meet its vision and mission, the IMU has equipped itself with the necessary human resources and infrastructure facilities and has placed itself in a formidable position as a healthcare educational facility in local, regional and global settings. The prestige that the IMU has earned during its existence for over two decades is reflected as oversubscription of positions in the undergraduate medical programme. Besides attracting international students, the IMU has attracted many experienced teachers in the field of healthcare; locally, regionally and globally, giving it a true international flavour.

The academic, administrative and corporate staff, as well as students of the IMU are driven by the following core values that are embodied in its culture. These core values are encapsulated in the acronym TRUST, which encompasses the following:

1. Trustworthiness – we are trustworthy and stand for integrity, reliability and commitment
2. Responsiveness – to change, and to the needs of individuals and communities
3. Unity – of vision and in working towards the achievement of common goals
4. Service – a commitment to providing outstanding service;
5. Tenacity – in the pursuit of excellence.

6.2.1 The IMU's Educational Philosophy

The undergraduate medical programme of the IMU, in keeping with trends in medical education has an integrated-spiral-modular curriculum with the SPICES model embodied in it (Harden, 2009). The curriculum is outcome-based, with graduates expected to develop competencies in the following domains: application of basic sciences in the practice of the profession; psychomotor skills; family and community issues in healthcare; disease prevention and promotion; communication skills; critical thinking; problem-solving and research; self-directed lifelong learning with skills in information and resource management; and professionalism, ethics and personal development (Lim *et al.*, 2013). These outcomes are expected to drive all aspects of the curriculum in terms of content and organisation, delivery and educational settings as well as assessment and quality activities. We strive to fall in line with the recommendations in the seminal document, Tomorrow's Doctors (General Medical Council, 1993) which states that doctors should have a blend of both scientific and humanitarian aspects involving a critical approach to learning, open mindedness, compassion, and concern for the dignity of the patient. The University has gone beyond its undergraduate medical programme and adopted these General Medical Council (GMC) recommendations to its other undergraduate programmes as well.

It is known that there are several factors that affect learning besides the curriculum. These factors include the learning environment, previous learning experiences of students, student learning styles, student motivation, demotivation and disillusion; and the context of learning. Academics need to address these requirements in order to optimise the education of undergraduates and postgraduates. Teachers have the role of imparting knowledge and transferring skills but they have to bear in mind that adult learning experiences are enriched by sharing their experiences and reflecting with students. The IMU has therefore scaled

down didactic lectures and given more emphasis to teaching and learning in small groups through processes such as problem-based learning (PBL) and task-based learning (TBL).

In professional training, teachers have to be conscious about their own conduct in the way of attitudes, actions, their level of enthusiasm and the comments they make in front of students. In addition, teachers have to be knowledgeable, clinically competent, organised and clear in their interactions with students, and be equipped with group instructional skills and clinical supervision skills. Many students are likely to emulate their teachers in their professional careers and therefore it is incumbent on the teachers to be good role models. We need to be mindful of unconscious bad conduct at times of heavy workload as such behaviour can impart negative role modelling for students.

6.2.2. Alignment of IMU's Eight Learning Outcome Domains to Its Educational Philosophy

Students are encouraged to reflect on the eight key learning outcome domains of the IMU following any active learning situations such as clerking patients, visiting a hospice, after a laboratory experiment or on conclusion of a research project. The following account attempts to describe how various learning experiences in the IMU enable these key learning outcomes to fall in line with the educational philosophy of the University (Lim *et. al.*, 2013).

6.2.2.1 Application of Basic Sciences in the Practice of the Profession

Vertical integration of basic sciences to clinical sciences early in the programme makes theoretical knowledge that is imparted in basic sciences more meaningful. Such integration helps to foster interest and motivation

of students whilst enabling better retention of the subject matter. As the IMU curriculum is integrated and spiral in nature, it enables gradual change balance on the emphasis from basic sciences to clinical sciences from junior to senior years in the undergraduate training programme.

6.2.2.2 Psychomotor Skills

Psychomotor skills are learned within the hospital in a variety of locations such as wards, outpatient clinics, operating theatres, labour rooms, intensive care units, coronary care units, dialysis units, department of physiotherapy and rehabilitation, and department of radiology and imaging. For medical students, these facilities give endless opportunities and provide goldmines of clinical material. However, students are first taught the theoretical basis of their professional activities before embarking on hands-on training. Video film demonstrations and computer simulations are of great assistance in demonstrating psychomotor skills. This is carried out mainly in the first few semesters and such inputs get consolidated at later stages of their spiral curriculum. Students are generally inducted to these activities in the protected environment of Clinical Skills and Simulation Centre (CSSC) where they practise various psychomotor skills on models or on standardised patients, under the guidance of staff, at their own leisurely pace. Psychomotor skills are also emphasised in other health profession programmes such as Dentistry, Pharmacy, Chiropractic and Chinese Medicine.

6.2.2.3 Family and Community Issues in Healthcare

The IMU recognises the importance of addressing family and community issues in relation to health. Therefore, students are given exposure as to how patients are cared for in both inpatient and outpatient settings. This ensures that students more or less walk the patient from the hospital to the community, gathering the experience in managing acute illnesses,

convalescence and for patients with chronic disorders, their long term care. Such follow-up of patients to the community is achieved through Community and Family Case Studies (CFCS) in the IMU Clinical School. In addition, we feel that CFCS programme might initiate motivation in students to opt as primary care physicians in their professional life.

6.2.2.4 Disease Prevention and Health Promotion

Our students are often reminded of the adage 'Prevention is better than cure'. All aspects of prevention of diseases including primary, secondary and tertiary prevention are emphasised in the curriculum. A wide array of topics, from A to Z, on the prevention of diseases, ranging from air pollution to zoonosis, are taught in the curriculum. From practice point of view our students learn through a range of activities such as practice of aseptic techniques in the operating room to implementation of immunisation in the community clinics. Students engage in disease prevention activities and in health promotion via a range of situations such as individually addressing specific patient related issues with patients and his/her carers in the hospital, to broader issues in the community such as prevention of common diseases like diabetes, dyslipidaemias, hypertension, infective diarrhoeas, addiction to tobacco, alcohol and narcotics as well as health screening for cancers such as those of the breast and cervix.

Outside the IMU and the hospital, students address disease prevention and health promotion in learning situations like CFCS projects or in special community service projects like the IMU Cares Project. Activities undertaken in the IMU Cares Project include running of community clinics and health camps; and adoption of disadvantaged communities under the 'Kampung Angkat' programme. During these exposures students are expected to do health screening and give health education talks under the guidance of the IMU staff. Such activities

not only involve medical students but also students from other health professions and this promotes interprofessional learning.

6.2.2.5 Communication Skills

Students are encouraged to demonstrate their ability to communicate well, in both spoken and written English. Teachers get ample opportunities to see how they fare in spoken English during PBL and TBL sessions, case presentations, seminars, tutorials and in sessions on role play; and in written English, when they scrutinise students' written submissions such as portfolios, patient case reports, CFCS reports and reflective reports.

6.2.2.6 Critical Thinking, Problem Solving and Research

Our undergraduates are encouraged to engage in deep learning (self-actualisation) and to have a reflective approach in their learning and to identify problems and to solve those by means of scientific and logical thinking (Hutchinson, 2003). Triggers for such learning stem from situations like student research projects, PBL and TBL sessions and in portfolio writing. They are encouraged to appraise learning materials critically and reflect on their experiences. Students are expected to ask questions 'why' and 'how' rather than accepting facts on its face value. Such training is expected to equip them for lifelong learning.

Critical appraisal of data using 'Evidence-Based Medicine' is part of the IMU culture. We use 'Clinical Practice Guidelines' that are nationally and internationally accepted when caring for our patients. Clinical audits are part and parcel of the IMU in its quest for excellence.

Ability to conduct research is an expected outcome in all academic programmes of the IMU. Research is important

as it triggers the development of an inquiring mind. The skills acquired are also crucial to some students who are interested to pursue a career-based on research.

6.2.2.7 Self-directed Lifelong Learning (SDL) with Skills in Information and Resource Management

The document 'Continuing Professional Development: Guidance for all Doctors' (General Medical Council 2012) states that training in SDL helps students to update what they learnt in medical school and during postgraduate training to reflect changes in practice, changes in the needs of patients and the service, and changes in society's expectations of the way doctors work, later in life. In the IMU, web-based learning is integrated with conventional face-to-face teaching and learning, and this approach encourages SDL. Several interactive teaching/learning packages have also been developed to enhance SDL.

Electives and selectives are periods when students engage in flexible learning options outside the IMU in Malaysia or overseas, and its nature is decided by students themselves, exposing them to different cultural and organisational settings. This enables students to obtain a kind of training different to what they would get in the IMU giving an opportunity to foster their other medical/healthcare or non-medical/non-healthcare interests and talents. Such experiences are known to mould and equip undergraduates to face their professional life as they develop self-reliance and maturity.

6.2.2.8 Professionalism, Ethics and Personal Development

We need to realise that medical students, dental students and allied health undergraduates begin the process of becoming a professional from day one of their career at the university. Being a professional means many things, including internalising and adhering to a set of values,

behaving according to standards of practice in healthcare services, and being accountable to patients he or she serves. Professionalism therefore has both personal and public elements. Ideally, professional conduct should exhibit altruistic behaviour in which interest on the patient comes before self-interest of the professional.

As in any teaching institution, we have to accede to the fact that entities such as declared curriculum, taught curriculum and learned curriculum differ but they overlap, and that there is a fourth entity, 'the hidden curriculum' outside the purview of the first three (Harden, 2009). The hidden curriculum to a great extent determines learning that is occurring in the attitudinal learning domain and it is here that most of the learning occurs with regards to professionalism, ethical behaviour and personal development.

To excel in professionalism, ethical behaviour and personal development, undergraduates need to develop soft skills such as communication skills, leadership skills, mentoring skills, time management skills, team-working skills etc. Therefore, we need to ensure that students imbibe such skills and qualities whilst working in the micro-environments of the interphase between health services outlets and the public domain.

6.3 Learning, Critical Thinking and Application of Knowledge in a Learning Organisation

6.3.1 Learning

Teachers and students alike have a general sense of what it means to learn. Teachers often assume that, because they are teaching, students must be learning. Students assume that, because they have read their lecture notes and memorised facts, they have learned something (Wirth and Perkins, 2008). In reality, studies have shown that the

traditional instructional methodologies, including didactic and teacher-centred approaches, are no longer effective in enabling students to learn, or retain what they do learn. It has long been recognised that students need to be taught how to think and how to learn. The Association of American Colleges in 1985 made the recommendation that the central theme of any curriculum should be to teach students "how to learn". The report of the American National Science Foundation, *Shaping the Future* (1996), urged teachers "to promote new kinds of learning that include developing skills in communication, teamwork, and lifelong learning." "Society and individual learners now have different needs, both in terms of what people need to learn and how they can and should learn" (Fink, 2003). Similar recommendations and efforts to improve students' thinking abilities have been put in place in Malaysia since the 1980s. Numerous workshops have been conducted to prepare school teachers and university lecturers on 'Optimal Learning', Critical and Creative Learning and the like. Nonetheless, these training courses have been found incapable of adequately preparing teachers to teach the higher-order thinking skills (Nagappan, 2001).

If one looks up a dictionary for the definition of 'learning', one is likely to come across "acquisition of knowledge or skills through study, experience, or being taught" (Oxford English Dictionary), or "the act, process, or experience of gaining knowledge or skill" (Free On-line Dictionary). These definitions do not elucidate the connection between learning and acquisition of knowledge or skill, e.g. does memorising facts amounts to gaining of knowledge? The definition of Wikipedia provides a clearer insight into the definition of learning: "acquiring new, or modifying and reinforcing, existing knowledge, behaviours, skills, values, or preferences and may involve synthesising different types of information". The latter part on 'synthesising different types of information' implies the reader must go through the process of recall, reflection followed by organising what is learnt to create new ideas or products. In their book

“Mosaic of Thought”, Keene and Zimmermann (2007) said that synthesis is about “organising the different pieces to create a mosaic, a meaning, a beauty greater than the sum of each shiny piece. A synthesis occurs as a reader summarises what has happened and gives it personal meaning.” This is in fact critical thinking whereby students must (i) be able to identify the “parts” of their thinking and (ii) to use those parts in thinking (Paul and Elder, 2004).

6.3.2 Critical Thinking

What does critical thinking really mean? Typing these two words in the Google generates 11 million hits in the first instance! Obviously, there is a massive amount of information, including ‘how to do it yourself’ kits on critical thinking.

Actually, critical thinking is as ancient as Socrates who lived some 2,500 years ago. Since then, other philosophers have contributed to the development of tools for critical thinking, whilst scientists have applied the tools of critical thinking in their thoughts on the natural world (Wirth & Perkins, 2008). Socrates’s written dialogues we have today were written by his student, Plato. In the Socratic Method or so-called Socratic questioning, questions are asked that focus on seeking clarifications fundamentally. An often cited example of the Socratic Method is the occasion when he was asked “Can virtue be taught?” to which Socrates asked back “Can you tell me what virtue is?” Essentially, the Socratic Method is a conversation wherein two or more people are engaged in assisting one another to find the answers to difficult questions, through the thoughtful use of questions. For example, a student’s answer to a question may be followed by asking a fellow student to summarise the previous answer. Summarising the information allows the student “to demonstrate whether he or she was listening, had digested the information, and understood it enough to put it into his or her own words” (Walker, 2003).

Over the years, many definitions have evolved for the term critical thinking. In reading through several of them, these three explanations below are selected as having less ‘knotty ambiguity’. They delineate the scope, main elements and outcomes of critical thinking in a way that is easy for students and lecturers to comprehend.

1. Critical thinking is a process that begins with an argument and progresses toward evaluation. The process is activated by three interrelated activities: (a) Asking key questions designed to identify and assess what is being said, (b) Answering those questions by focusing on their impact on stated inferences, and (c) Displaying the desire to deploy critical questions (Browne and Keeley, 2011).
2. Someone with critical thinking skills is able to do the following: (www.philosophy.hku.hk)
 - understand the logical connections between ideas
 - identify, construct and evaluate arguments to detect inconsistencies and common mistakes in reasoning
 - solve problems systematically
 - identify the relevance and importance of ideas
 - reflect on the justification of one’s own beliefs and values
3. “The central core of your critical thinking skills is your ability to detect, generate and evaluate reasons given in support of some conclusion. This conclusion might be a new belief, or a change in plans, or a confirmation that the old beliefs are OK” (Dowden, 2013). It is argued that for students to be able to develop critical thinking skills, they must first possess appropriate dispositions to think critically. These dispositions or temperaments are lacking in Malaysians generally. Basically, we need to nurture from young the disposition to be inquisitive, a desire to learn and not to accept acquiescently everything they read or are told. Table 6.1 describes several dispositions to think critically.

Closely linked to critical thinking is one’s ability to reason. Reasoning is characterised by several key elements and Table 6.2 shows the guidelines for developing the elements of reasoning (Paul and Elder, 2004).

Table 6.1 Dispositions to think critically (Facione et. al., 1994).

Disposition	Definition
Inquisitiveness	One’s intellectual curiosity and desire for learning
Open mindedness	Being tolerant of divergent views and sensitive to the possibility of one’s own bias
Systematicity	Being orderly, organized, focused, and diligent in inquiry
Analyticity	Prizing the application of reasoning and use of evidence to resolve problems, anticipating potential conceptual or practical difficulties, and consistently being alert to the need to intervene
Truth seeking	Being eager to seek the best knowledge in a given context, courageous about asking questions, and honest and objective about pursuing inquiry even if the findings do not support one’s self-interests or one’s preconceived opinions
Maturity	Approaching problems, inquiry, and decision making with a sense that some problems are necessarily ill-structured; some situations admit more than 1 plausible option; and many times judgement must be made based on standards, contexts, and evidence that preclude certainty

Table 6.2 Guidelines for developing elements of reasoning (modified from Paul & Elder, 2004; cited in Wirth and Perkins, 2008).

Elements of Reasoning	Guidelines
Purpose or Motivation	Choose significant and realistic purposes; state your purpose clearly; distinguish your purpose from related purpose; periodically check your purpose is still valid

Question or Problem	Clearly and precisely state the question; reformulate the question several different ways to clarify its meaning and scope; identify if the question has one right answer, is a matter of opinion, or requires reasoning from more than one point of view
Assumptions	Clearly identify your assumptions and determine if they are justifiable; consider how the assumptions are sharing your point of view
Point of View	Clearly identify your point of view; seek other points of view and identify their strenghts and weaknesses; seek an open-minded evaluation of all points of view
Data, Information, Evidence	Restrict your claims to those supported by the data that you have; search for evidence that opposes your position as well as support it; make sure that all information is clear, accurate, and relevant to the question; make sure that you have gathered sufficient information to address the question at hand
Concepts and Ideas	Identify key concepts and explain them clearly; consider alternative concepts; make sure you are using concepts with care and precision.
Inferences and Conclusions	Infer only what the evidence implies; check inferences for internal consistency; identify assumption with lead you to your inferences
Implications and Consequences	Trace the implication and consequences that follow from your reasoning; search for negative as well as positive implication; consider all possible consequences

A student may possess the knowledge to think critically, but if these dispositional affects do not work in concert, the student may fail to analyse, evaluate, and synthesise the information to think critically. Hence, for the purpose of teaching students to think critically, several universities around the world, especially those with liberal arts curricula, offer specific courses or modules in critical thinking over an entire semester. Hence critical thinking should not be deemed as a subject that can be inculcated in students in just a few lectures.

6.3.3 Applying Knowledge

An often lamented fact is that students are not able to apply their classroom knowledge to real-life situations. Why are students not able to transfer knowledge from one context to another? Do students have to be taught how to draw connections between module materials and the real-world context? Can such elements be taught in a classroom as a specific module, like critical thinking?

Some modules have in-course opportunities that allow students to extend their learning in a real world setting. These include practical attachments or training practicum with people or organisations outside the university, such as the industry, hospitals, welfare homes and the community. Certain academic programmes such as nursing, medicine, dentistry have a clear pathway to such practicum. How about other academic programmes that do not lend themselves to such settings? An approach but not the only means, is through organised community services, such as the IMU Cares projects, whereby faculty and students extend their knowledge or skills to various population groups. Students must be allowed to make the connections themselves and absorb the challenges of the environment and the lives of the people. Hopefully, they will be able to connect the exposure to the realities of the working environment as an experience to enhance their effectiveness as future healthcare professionals.

When a course material is coupled to real-life situations, e.g. I tell students “I bring the slides to your life” as I share research and other experiential evidence, I sense students are more likely to connect with the relevance of the factual information being delivered. Lecturers should be trained to integrate facts or abstract theories and real-world applications. Such an education better prepares students who can draw on their academic preparation to participate more effectively in not only the arenas of professional work but also in daily life.

The word ‘education’ originates from the Latin ex-ducere, meaning “to lead out of.” The classical presupposition is that education leads one out of ignorance to knowledge. In the conventional education system, copious amounts of facts and information are imparted to students. However, mere mastering of a vast body of knowledge is not enough to meet the complex demands of the rapidly changing world. Moreover, a person with a good memory and who knows a lot of facts is not necessarily good at critical thinking. We want graduates who have the capacity to learn, not who know everything.

Students must acquire lifetime skills such as critical thinking, reasoning ability, effective communication, along with such abilities as sourcing for needed information and interacting well with others. We want our graduates to be able to transfer their knowledge and skills as seamlessly into the work site.

We can take a leaf from the Boeing Company’s profile of a “work-ready” graduate. Such an individual “(1) can effectively manage knowledge, information, and systems as well as multiple tasks, resources and people; (2) is technologically savvy both in general and in specific technological areas; (3) can work, problem solve, and communicate (orally and in writing) in a team setting; (4) is flexible, and a continuous, lifelong learner who can participate and accommodate rapidly changing global work environments.” Arguably and philosophically, the best learning prepares people to deal with uncertainty.

In a learning organisation such as the university, it is imperative that the organisation facilitates and promotes the learning of its members (Senge, 1990). It is said that organisations should become more like communities so that employees can feel a commitment to and presumably, work harder for the organisation. In an iterative manner, the learning organisation itself also learns from that learning, and continuously transforms itself to remain competitive in the business environment.

6.4 Culture of Inquiry

According to Reid (2004), inquiry is a process of systematic, rigorous and critical reflection about professional practice, and the contexts in which it occurs, in ways that question taken-for-granted assumptions. Its main purpose is to inform decision-making for action. Inquiry can be undertaken individually, but is most powerful when it is collaborative. The inquirer may seek answers to questions or puzzles that come from real-world observations and dilemmas. There are two important dimensions in inquiry. The first is a 'conceptual dimension' which involves educators analysing the reasons for actions taken, such as examining the theory behind the practices and exploring alternatives. The second is a 'critical dimension' which involves justifying what is done in relation to the moral, ethical and socio-political issues associated with practice and looking at the external forces and broader social conditions that frame it, in order to gain further understanding (Farrell, 2004).

As inquirers, educators need to question their routine practices and assumptions, and should be capable of investigating the effects of their teaching on student learning (Reid, 2004). In a culture of inquiry, both students and educators are engaged in systematic investigation, searching and researching, asking questions, mulling over hypotheses, debating, and trying new perspectives (Pelo, 2006). The following types of reflective questioning may be asked in the process of inquiry (Reid, 2004):

1. What am I/are we doing in relation to this current practice/issue/question/puzzle?
2. Why am I/are we doing this?
3. What are the effects of these practices? Who is most advantaged/least advantaged?
4. What alternatives are there to the current practice? Are these likely to result in just more outcomes? How will we monitor these changes in order to assess their

outcomes? In order to foster deep and transparent critical inquiry, we need conditions that:

- i. encourage discussion and debate, involving the widest range of voices possible
- ii. reject certainty and dogmatism
- iii. recognise that there is no one right way to approach complex educational issues
- iv. are based on trust, where people feel free to talk about difficulties and concerns in their teaching
- v. provide avenues for all participants to have a voice, and do not allow the strongest voices to dominate
- vi. model inquiry at all layers of the system
- vii. are respectful, tolerant and civil

The following values and/or characteristics need to be inculcated in a culture of inquiry: curiosity, willingness to linger with questions, commitment to constructing knowledge with others through dialogue, disagreement and challenge, and attentive observation. A culture of inquiry is important in a learning organisation like the IMU. Such culture should be internalised into every member of the organisation: faculty, student and support staff.

6.4.1 Inquiry-based learning

In inquiry-based learning, the emphasis is not on memorising facts but more about formulation of questions and finding appropriate resolution to questions and issues (Edutech Wiki, 2014). It is often described as a cycle or spiral, involving formulation of a question, investigation, creation of a solution or an appropriate response, discussion and reflexion in connection with results (Bishop *et al.*, 2004). The inquiry cycle engages students to ask and answer questions on the basis of collected information, which should lead to creation of new ideas and concepts (Edutech Wiki, 2014). In inquiry-based learning, progress and outcomes are assessed by how well the learners

develop their experimental and analytical skills, and how well they work in groups (Wikipedia, 2013). Inquiry-based learning is indeed an integral component of the IMU educational philosophy which emphasises on lifelong learning, self-directed learning, experiential learning, and interprofessional learning.

There are five major steps in the cycle of inquiry: Ask, Investigate, Create, Discuss and Reflect (Figure 6.1).

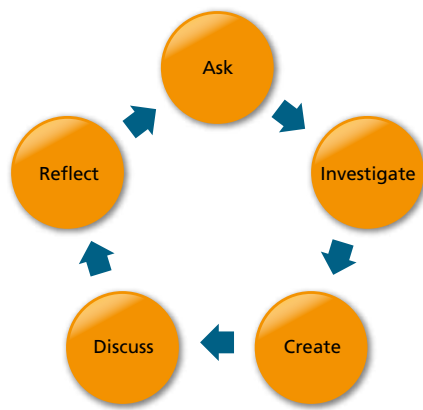


Figure 6.1 The five global activities according to the cyclic inquiry model in inquiry-based learning (Wiki Tech, 2014).

The five processes will be further elaborated in the following sections in the context of the IMU learning model. The Ask process is to stimulate student's curiosity to come up with their own questions. The teacher can stimulate the curiosity by giving an introductory talk or lecture related to the concepts that have to be acquired. Students then formulate their own questions and explore deeper to understand the learning subject.

The initial curiosity in Ask leads to Investigate which seeks and creates information. Student or group of students will collect information, study, collect and exploit resources, and experiment. Investigate is a self-motivating and an

active learning process that redefines "the question", makes it clearer or takes another direction.

In *Create*, students start making links of the information gathered and the ability to synthesise meaning is the spark which creates new knowledge. New thoughts, ideas and theories that are not directly inspired by the students' experience may be generated. As part of the learning activities, students are required to write them down in some kind of report. Following the synthesis of new knowledge, students will share their ideas with each other, and ask others about their own experiences and investigation in the *Discuss* process.

Knowledge sharing amongst the learners' community, which includes students and faculty, is a key element in a culture of inquiry. There should be collegial interaction through seminars, workshops or discussions amongst faculty to share and deliberate on research findings or other academic matters.

In the *Reflect* process, the learners should take time to look back and think again about the initial question, the path taken, and the actual conclusions. Some of the questions that may be asked in this process: "Has a solution been found?" and "Any new questions appear?" A researcher may ask "What would be a better way of conducting the experiment if given the chance to do it again?" Students may capture their learning experience through reflective writing in their portfolios.

PBL, a key instructional approach in the IMU curriculum, is very similar to inquiry-based learning. However, the major difference between PBL and inquiry-based learning relates to approaches that are essential in developing a culture of inquiry in the IMU. In the context of research, the inquiry-based learning approach is crucial in generating the appropriate research questions, and in interpreting critically any research findings.

6.4.2 Levels of Inquiry

According to Banchi and Bell (2008), there is a four-level continuum of inquiry: confirmation, structured, guided and open inquiry. The continuum emphasises on how much information (e.g. guiding questions, procedure and expected results) is provided to students and how much guidance is provided by the teacher. In confirmation inquiry, students are given the question and procedure (method), where the results are known in advance. The teacher's aim is to reinforce a previously introduced idea; to introduce students to the experience of conducting investigations; or to let students practise a specific inquiry skill, such as collecting and recording data. At the level of structured inquiry, the question and procedure are still provided by the teacher but students are expected to generate an explanation supported by the evidence they have collected. Confirmation and structured inquiries are considered lower-level inquiries. Practical classes are where students conduct experiments to understand better certain scientific concepts that fall under this category.

At the third level, guided inquiry, students are provided with the research question, and they are expected to design the procedure (method) to test the question, and provide explanation for the results obtained. At the fourth and highest level of inquiry, open inquiry, the learners formulate their research questions, design the experiment, conduct the investigations, and communicate their results. At this level, the researcher should be able to record and analyse data, as well as draw conclusions based on the evidence they have collected. All postgraduate students are expected to be competent in conducting inquiry at this level.

6.5 Measurement and Evaluation of Scholarship in Teaching and Learning

Scriven (1991) describes assessment as "the process, whose duty is the systematic and objective determination of merit,

worth, or value and without such a process, there is no way to distinguish the worthwhile from the worthless". In order to weigh the worthiness of the SOTL, one has to first put into perspective, the scope/definitions and aims of the SOTL and how it is operational in such defined terms.

Most faculty members have had no explicit nor formal training in the SOTL. Although they bring to the activity their training as scholars in their disciplines, they very much remain novices as scholars of teaching. They therefore need to develop and to learn how to develop the expertise needed to contribute to a SOTL (Smith, 2001). The development of a SOTL is still in its very early stages, so the participants are, in fact, engaged in constructing both the knowledge and the methods that will define the field of practice and how these will be best assessed (and this will in turn feed back into the cycle of shaping the SOTL). Before assessment of the SOTL can be made, it is necessary to recapitulate the four main domains of SOTL:

- Discovery - where one builds new knowledge through hypothesis-driven original basic, clinical, epidemiological, or other research on a subject, with inquiry that builds the knowledge of the discipline
- Integration - whereby current knowledge is synthesised to make it useful to other researchers, clinicians, patients, policymakers, and/or educators; illuminating the data in a new way and making connections across disciplines and the community
- Application - whereby knowledge is used to face challenges, improve conditions and solve problems i.e. engaging in a "real situation"
- Teaching - where programmes/courses are developed, implemented and evaluated to educate students, professionals, patients, or the public. Here is where the act of teaching is interrogated and together with the process of interaction, creates new understanding

6.5.1 How Can the Scholarship of Teaching and Learning (SOTL) be Measured?

For a number of decades many institutions the world over, have been rewarding most highly research accomplishments. However, in recent years there has also been reaffirmation of their historic mission of teaching and seeking new ways to support public engagement through integrative and applied scholarship, as well as research.

Schulman (1999) explained that for a teaching and learning activity to be designated as scholarship it should manifest at least three key characteristics: It should be public, susceptible to critical review and evaluation, and accessible for exchange and used by other members of one's scholarly community. Over time, various models of scholarship have emerged (Trigwell et al., 2000; Trigwell & Shale, 2004; Antman & Olsson, 2007) but the three key characteristics of scholarship as the backbone remain.

Thus, the SOTL are activities that have been made public in some manner, have been subjected to peer review by members of one's intellectual or professional community, and can be cited, refuted, built upon, and shared among members of that community and serves as the building blocks for knowledge growth in a field.

6.5.2 What Aspects of the SOTL Should be Assessed?

In some institutions quantitative criteria over-emphasise research and undercut scholars' achievement. In others, there are qualitative guidelines from promotion and tenure committees, granting agencies and journals; many of which focused on discovery or published integrated work. All of these were strung on different criteria.

Glassick et. al. (1997) recognised that all works of scholarship, be they discovery, integration, application, or teaching, seem to involve a common sequence of unfolding

states. They therefore concluded that when people praise a work of scholarship they usually mean that the activity in question shows that it has been guided by these qualitative standards.

Glassick et. al. (1997) also recognised that in scholarship, the work of the scholar becomes consequential only as it is shared with others. Put very elegantly, they emphasised in the report on "Scholarship Reconsidered", that the academic institution needs to encourage and reward all categories of scholarship (including SOTL). One category, the scholarship of discovery, comes closest to what is meant when academics speak of "research" and this should be reaffirmed. However, they also highlighted the need to recognise that "without integration, knowledge becomes pedantry; without application, knowledge becomes irrelevant; and without sharing through teaching, the continuity of scholarship is lost". So therefore if higher education is to be enriched by exchange among these different forms of scholarship, a very inclusive view of what it means to be a scholar is deemed necessary. With this end in mind Glassick et. al. (1997) worked out a list of six criteria for assessing scholarship as shown below:

6.5.2.1 Criteria for Assessing Scholarship

1. **Having clear goals** - The scholar explicitly states the basic purposes for the work and defines realistic, achievable objectives, including desired goals and outcomes. When assessing a scholarly activity it requires the professor to be professionally well prepared. Whether engaging in discovery, integration, application, or teaching, the scholar must bring the wealth of knowledge, depth of experience, and combination of resources that the project needs.
2. **Adequate preparation** - The scholar has a solid understanding of existing scholarship relevant to the

endeavour (generic and discipline-specific) as well as adequate skills and resources drawn from this research and from prior experience to advance the specific project. Adequate preparation forms a standard of excellence for all scholars, regardless of their work.

3. **Appropriate methods** - In conjunction with the material and the teaching/learning context, the scholar's selections of educational methods fit the goals and are used effectively; the methods are modified as necessary to accommodate situational changes. In assessing SOTL the methods and procedures make all the difference - from the logic of the syllabus to pedagogical procedures to evaluation.
4. **Significant results** - The scholar achieves or exceeds the original goals; the scholar's work contributes substantially to others (e.g. learners and colleagues) and to the field; the scholar's work is open to further exploration (e.g. by self, by others, collaboratively with others). Peers and others are asked to comment on the extent to which a SOTL activity has made a substantial contribution that is "recognised by others." This is judged not by process but by results e.g. whether the interest or competence in the subject improved or whether something valuable was learnt.
5. **Effective communication / presentation** - The reviewer can discern that appropriate style and methods of presentation are used and that the resulting communication to the intended audience is clear and unambiguous. Glassick *et. al.* (1997) in their report, emphasised that it is equally important that the SOTL be communicated to colleagues as well as to students. He noted "In this spirit, we agreed with those colleges and universities who take as an indicator of excellence in teaching the sharing of innovative instructional materials and methods through formal publications,

conferences, and seminars, as well as through informal means". They clearly defined that scholarship in every form is a public act, and while some work is quite specialised it must, in the end, be known and understood by many others.

6. **Reflective critique** - In discovery, integration, application, or teaching, the scholar thoughtfully assesses his/her work and uses the resulting perceptions along with the reviews and critique from others, to refine, enhance or expand the original concept, thinks about his or her work, seeks the opinions of others, and develops his or her learning over time. This is recognised in university guidelines for judging research and teaching. Duquesne University, for example, cites as an indicator of effectiveness in scholarship: "Significant self-development activities, such as internal faculty development grants, that lead to increased research and publication effectiveness."

In some institutions e.g. Frostburg State University, reflective critique counts as a criterion for outstanding professional development - the undertaking of "a series of courses, workshops, and the like which lead to the development of a new area of expertise. Insightful reflection begins with self-conscious practice, which continues after a project is completed. This is especially important in the SOTL. Indeed, the quality of reflective critique, though least often recognised in the evaluation of scholarship, is regarded as the most important of all.

The six criteria of excellence in the SOTL above contain endless variations as the standards are applied in different ways to various disciplines. They define the core of excellence for all academic work. They form a common language of scholarship; one that cuts across the disciplines and across the institutions and binds a true community of teachers.

6.5.2.2 Formative and Summative Evaluation of Teaching Scholarship

The criteria developed by Glassick *et. al.* (1997) apply to all forms of scholarship. However, Kreber (2002) produced a list of indicators that may be used specifically for the formative and summative evaluation of what she calls teaching-scholarship. These indicators emphasise processes as well as outputs by looking at what scholars do in addition to what they produce (Kreber, 2002). She identifies three different knowledge domains:

- Instructional knowledge, which refers to the knowledge that teachers need to acquire in the area of instructional design;
- Pedagogical knowledge, which refers to what we know about how students learn and,
- Curricular knowledge, which refers to the goals, purposes and rationale of a course or programme

As with every field of study, formative assessment can be used to improve both the content (the body of knowledge created) and the process (the methods used to create that knowledge). Formative feedback, usually from colleagues, is a key feature of the examples that follow. Colleagues and peers invite, offer, and receive information about the quality of what they are doing (the individual inquiry project), with a view to improving its quality (Table 6.3). In the ideal case, there is also information about how things are being done (the types and format of their interactions) that can lead to improvements in the methods as well as the outcomes.

Table 6.3 Formative evaluation methods and teaching scholarship (adapted from Smith, 2001)

	Self	Students	Colleagues	Experts
Teaching	Incidental, informal, intuitive, trial-and-error	Fast feedback, current students	Peer partners, Various evaluative instruments	Teaching consultants
Scholarly teaching	Reading and discussion groups; book clubs Action research and classroom research Critical reflection Listservs			
**SOTL	Peer collaboration and peer review Course portfolio Carnegie Scholars Program Journal and grant reviewers Online journals and discussion groups			

Cambridge (2000) argues that in order to be seen as scholarly and to contribute to knowledge and advance practice, faculty need “to go public with their findings, to receive the kind of peer review that interrogates their methods and conclusions, and to change their teaching and their scholarly investigations of teaching based on that review.”

Formative evaluation methods for the SOTL can be carried out as listed in Table 3**:

- Peer collaboration and peer review - These include using teaching circles, making reciprocal classroom visits and observations, mentoring and coaching, and teaching teams, as well as using collaborative inquiry and departmental occasions for collaboration, which include hiring and intercampus collaboration and external peer review.
- Course portfolio
- Carnegie Scholars Programme
- Journal and grant reviewers - Faculty who submit an article to one of the many journals receive formative,

as well as summative, feedback on their work. Reviews of proposals submitted to teaching conferences provide feedback that serves to enhance teaching scholarship. Examination of the type of feedback is most helpful to faculty in improving the quality of their work.

- On-line journals and discussion groups

6.5.2.3. The SOTL Performance Index

The SOTL Performance Index, initiated by Paul Ramsden at the University of Sydney and carried on by Keith Trigwell (2004) is an option to support and enhance via learning through criteria and standards. Whilst teachers should be encouraged to 'step back and reflect systematically on their teaching' in ways that are consistent with a commitment to openness and mutual accountability, it is difficult to expect every teacher to be publishing higher education research. There are other arena that can be used to communicate about their teaching. The idea is of measuring the SOTL is not intended to reward every form of the SOTL, rather it seeks to support strategic SOTL activities that deliver the greatest benefit to the University.

A scholarship index could be employed to prepare a teaching award/grant application, to complete a qualification/programme in university teaching or research supervision, formally mentoring a teaching colleague or producing a full length SOTL article for a house journal or running a department-wide SOTL forum.

The measurement of the SOTL is largely dependent upon:

- Specificity to dictate the research methodology
- Measurability by an objective assessment of the student's learning
- Attainability with the resources available
- Relevance to the current teaching/learning problem?
- Timeliness i.e. completion within the time available

Some examples of SOTL and their assessments are as follows:

- **Students' Understanding Using Mind Maps** – an initiative research project that explores alternative ways of assessing student learning in the undergraduate education
- **Impact of Case-based learning on Student Engagement and Learning** - A series of case-based-scenarios that help to encourage the connection of concepts taught with real life examples that have been used throughout the semesters and exploring if that had any impact on students' clinical reasoning/critical thinking including how the concepts covered were connected to real life situations
- **The Effect of Reflective Portfolio-Keeping** – an effort to observe the effects of maintaining a reflective portfolio on the students' development of insight and evidenced-based decision-making

6.6 Appropriate Digital and Other Tools in Academia, Research, Professional Services and Outcome Measures

Use of digital tools has a profound influence on modern day education, research, professional services, and outcome measures. Electronic media has become a preferred mode of learning, especially among the new generation of learners known as Net Generation, Generation @, Homo Zappiens or Digital Natives (Tenhaven *et. al.*, 2013). The advent of internet technology has allowed learning to take place across physical and cyber spaces, especially in distance education. The current internet technology is termed Web 2.0 which is characterised by a "read-and-write" mode compared to the predominantly read-only Web1.0 (Greenhow *et. al.*, 2009). Web 2.0 enables "participatory", "collaborative", and "distributed" practice within the learning spheres of everyday activities (Lankshear and Knobel, 2006). There are a variety of Web 2.0 tools ranging from web forums, social networks, blogs, instant messaging, wikis to podcasts (Table 6.4).

Table 6.4 The different valuable Web 2.0 tools for teaching and learning (adapted from Tenhaven et. al., 2013).

Web Tool	Functions
Internet forum	A virtual space on the internet which facilitates discussions and their archiving. The discussion usually does not take place in real time, but asynchronously.
Social network	A web service where users log on, connect with each other and upload their own content and share with other users of similar primary areas of interest and are able to comment on third-party content. Examples: Facebook, MySpace and Ning.
Blog	A public web diary or journal, also referred to as a web-log Examples: Twitter and Blogger.
Instant messaging	Using instant messaging, two or more participants can hold a realtime conversation using text messages via so-called "push function". An instant messenger (IM) is a computer programme which must be installed by all participants of the discussion, the so-called "chat".
Wiki	Software which supports collaborative work on the internet with page content which can be changed by any user via editing the content in their browser and with the further option of engaging in discussion with other users. Example: Wikipedia.
Podcasts	Audio and video files which can be subscribed to, usually via an (Really Simple Syndication) RSS Feed.

The use of digital tools for learning has become even more popular with the easy access of mobile devices such as smartphones and tablets, which come with various educational Apps. The mobile information resources can contribute significantly to learning for clinical students, as found in a study by Davies et. al. (2012). However, students felt that such tools could serve as an important addition to the learning ecology rather than a replacement. One main advantage is that such tools enable ‘reactive’ or ‘opportunistic learning’, which “occurs in the middle of action” rather than time being set aside for deliberate acquisition of knowledge. In another study, podcasts were found to be a useful learning tool amongst Canadian anaesthesia residents, and were mainly viewed for information on procedural skills, journal article summaries and case presentations (Matava et. al., 2013). Podcasts may be more attractive than lectures to the learning styles of “Generation Y” medical students and residents.

Although there are vast amounts of online information available, students have to be competent in the skills and

capabilities to search and retrieve, as well as evaluate and synthesise various types of information, a process known as information literacy. For instance, the majority of students prefer to retrieve information from Google rather than evidence-based databases such as PubMed, as found in a study on first-year dental students (Kingsley et. al., 2011). The study confirmed that there was a lack of information literacy amongst the student population, and it was recommended that there should be an integration of modules within the curriculum to help students to filter and establish the quality of online information in the training of healthcare professionals.

Digital tools are particularly relevant to medical professionals (e.g. radiologists) in providing predictive, personalised and participatory medicine (Li et. al., 2013). For instance, integration of digital image data with genetic and laboratory data will be increasingly important in clinical outcome measures and provision of personalised medicine. In radiology informatics, electronic medical records and medical image database can be channelled to ‘knowledge discovery

databases' followed by interpretation based on 'computer-based reasoning' (Figure 6.2; Li *et. al.*, 2013). Online knowledge databases are required to store the massive amount of such data to assist in clinical specialist decision-making. The development of powerful supercomputing, statistical learning and artificial intelligence approaches has enabled the analysis of massive bioinformatics and personalised healthcare data (Yang *et. al.*, 2008). This will have a profound effect on how biomedical research will be conducted towards the improvement of human health and prolonging of human life in the future.

In another development, the availability of whole slide imaging data sets (digital slides) from glass slides in pathological investigations offers new opportunities for the development of computer-aided diagnostic (CAD) algorithms. The digital slide archives can be used to create image microarrays (IMA), which consist of an array of hundreds to thousands of high quality digital images from various tissue sections, with each containing key diagnostic morphologies (Hipp *et. al.*, 2007). The IMA has numerous applications in education, proficiency testing, consensus case review, and research.

The growth in Web 2.0 interventions has also led to the emergence of e-patient communication tools that enable patients, especially older adults to locate and share disease management information, and to receive interactive healthcare advice (Stellefson *et. al.*, 2013). Development of Web 2.0 health and medical forums has led to greater opportunities for achieving better chronic disease outcomes. However, Stellefson *et. al.* (2013) concluded in their systematic review that there is still a need for greater understanding of the costs and benefits associated with using patient-centred Web 2.0 technologies for chronic disease management.

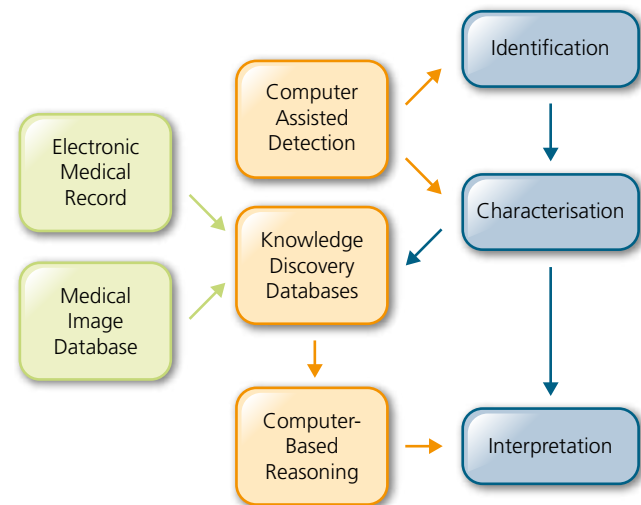


Figure 6.2 The use of radiology informatics in clinical image interpretation (Li *et. al.*, 2013).

In terms of research, bioinformatics tools have important applications in various fields including medicine, biotechnology and agriculture. According to the NIH Biomedical Information Science and Technology Initiative Consortium, bioinformatics is defined as research, development, or application of computational tools and approaches for expanding the use of biological, medical, behavioral or health data, including those to acquire, store, organise, archive, analyse, or visualise such data (Bioinformatics Definition Committee, 2000). Some of the research fields which have integral component of bioinformatics are shown in Table 6.5 (Bioinformaticsweb.tk, 2005). Various software tools based on different algorithms (e.g. PAUP and maximum likelihood) have been developed for phylogenetic studies, analyses of gene expression and gene regulation, comparative genomics, and systems biology. In addition, elucidation of molecular structures for prediction of bioactivities using in silico modelling is an important approach in attempts to understand the mechanism of action of drugs, and in the discovery of new drugs.

Table 6.5 Research fields which have integral components of bioinformatics (Adapted from Bioinformaticsweb.tk, 2005)

Research field	Focussed activities
Computational biology	The development and application of data - analytical and theoretical methods, mathematical modelling and computational simulation techniques to the study of biological, behavioural and social systems.
Genomics	Analysis or comparison of the entire genetic complement of a species or different species. It may also involve the comparison of more-or-less representative subsets of genes within genomes.
Functional genomics	A field of molecular biology that attempts to make use of the vast wealth of data produced by genome sequencing projects to describe genome function. Uses high-throughput techniques like DNA microarrays, proteomics, metabolomics and mutation analysis to describe the function and interactions of genes.
Proteomics	The study of proteins – their location, structure and function. It is the identification, characterisation and quantification of all proteins involved in a particular pathway, organelle, cell, tissue, organ or organism that can be studied in concert to provide accurate and comprehensive data about that system.
Pharmacogenomics	The application of genomic approaches and technologies to the identification of drug targets. Using genetic information to predict whether a drug will help make a patient well or sick. It studies how genes influence the response of humans to drugs, from the population to the molecular level.
Pharmacoinformatics	Concentrates on the aspects of bioinformatics dealing with drug discovery.
Cheminformatics	Transformation of data into knowledge for the intended purpose of making better and faster decisions in the arena of drug lead identification and optimization. This field includes computer assisted storage, retrieval and analysis of chemical information (chemical informatics), and the use of mathematical methods for the calculation of molecular properties or for the simulation of molecular behaviour (computational chemistry).
Structural genomics or structural bioinformatics	The analysis of macromolecular structure particularly proteins, using computational tools and theoretical frameworks. One of the goals of structural genomics is to obtain accurate three dimensional structural models for all known protein families, protein domains or protein folds.
Biomedical informatics / Medical informatics	The study, invention, and implementation of structures and algorithms to improve communication, understanding and management of medical information.
Systems biology	The coordinated study of biological systems by investigating the components of cellular networks and their interactions, through the application of experimental high-throughput and whole-genome techniques, and integrating computational methods with experimental efforts.

6.7 Scholarly Activities: Management, Dissemination of Knowledge and Organisational Behaviour

It may be pertinent to define what ‘knowledge’ means. Abrahamson and Eisenman (2011) are clearly of the view that it is a commodity, and within the context of a knowledge economy, it can be sold. Although these authors specifically focussed their discussion on ‘management knowledge’, their views are also pertinent for all intellectual knowledge in the knowledge economy. If we subscribe to this view it is imperative that the creation, marketing and utilisation of knowledge by stakeholders and consumers are managed efficiently. Scholars in whatever field are the creators and suppliers of knowledge; but who are the custodians and managers of such knowledge in an organisation? Should this be the responsibility of a designated officer or should the philosophy and practice of this important process be imbibed by all knowledge generators? More pertinently would be to determine what forms of knowledge generation should be encouraged and how these should be disseminated or marketed. Who determines the value, including market value, of such knowledge? How should these questions be addressed in an academic environment and in a learning organisation? Should academics be concerned about this and if so how do we ensure that they are aware of the potential implications?

6.7.1 Definition of Scholarly Activities and Knowledge Creation

There are many views of what constitutes scholarly activities, but a generally accepted definition would be the creation of new knowledge, interpretation of existing knowledge, or synthesising and reorganisation of existing knowledge into coherent patterns or networks for specific application. However, there is a perceived paradox arising from the unequal advancements, applications, utilisations and equitable distribution of translated benefits to various health and socioeconomic sectors. This has created questions as to whether we are managing and utilising

such knowledge appropriately. Furthermore, are we clear on the philosophy of knowledge creation and utilisation in our training of our health professionals? The same concern is implied in the report of the Commission set up to study and recommend on the training of health professionals for the new century (Frenk *et. al.*, 2010). Are our curricula which reflect our learning model for health professionals sufficiently robust to achieve the outcomes as measured by appropriate competencies? Are the principles of student centred, lifelong, outcome-based learning model (Lim *et. al.*, 2013), able to meet the demands of the new century? More importantly, are our curricula dynamic enough to meet changes and yet stable enough for effective implementation? How do we measure the quality of our graduates?

6.7.2 Organisational Behaviour and Knowledge Creation

Every organisation values institutional memory as it provides the foundation from which we not only draw lessons of success and failure but also values that serve as the moral compass in guiding our decision making. But the flip side is that organisational culture and behaviour may subconsciously impede needed change for progress. Thus Akgün *et. al.*, 2007 felt that learning organisations must also have the added skills of unlearning and discarding established beliefs and routines that are at variance with environmental change, including the associated market changes and technological advances. It would be appropriate for us to remember this while we introduce changes and strategise for the future. Examples of such unlearning that are needed within the IMU can be seen in the development of our curriculum delivery methods which have evolved from the didactic lectures to student directed learning with increasing use of interactive e-learning resources and information technology. Related to this is the realisation that faculty and students need to be trained in critical thinking to be able to evaluate and manage such information for maximum benefit.

6.7.3 Management of Knowledge in a Learning Organisation

Knowledge that is generated needs to be identified, assessed for its value and potential applications, translated and applied. Although not all these need to be carried out by the organisation from which the knowledge originated, each of the components could be consciously noted and decisions made on which of these should be done in-house or out sourced. Dissemination and communication to all stakeholders on the existence and value of such knowledge should be a strategic component of any learning organisation.

A regularly updated catalogue of important knowledge generated by any organisation including that of the IMU must be carried out and categorised and a designated person should be appointed as the focal point responsible. A possible list of significant knowledge generated could be categorised as:

- (a) Educational innovations
- (b) Research innovations, products and patents
- (c) Service, consultancies and training
- (d) Healthcare

Many learning organisations including academic institutions like the IMU have a marketing arm that is aligned to marketing educational programmes available. While this can be viewed as part of marketing of knowledge through our academic programmes, it does not address other important areas such as consultancies, services, innovations and research findings. The usual reasons given for this are that the marketing team is not aware of such marketable knowledge or that their importance has not been explained to them in an effective and comprehensible manner. Neither is there a well-defined list and appropriate information on the value of such knowledge products. The question to ask is whether

the generators of such knowledge are themselves aware of the value and if so, do they make a conscious effort to communicate this to management? Training programmes on identification and assessment of the 'market value' of these in a knowledge economy may sensitise our faculty on the importance of these mostly intangible assets. In relation to this, the Institute for Research, Development and Innovation (IRDI) was established on 18 September 2012 as part of the strategic plans to realign research activities and to commercialise some of the knowledge base at the IMU.

6.7.4 Community Service

Knowledge created must be utilised to benefit the community. Students at the IMU are imbibed with values of contribution to the community as an integral element in the education process. This awareness to social commitment was duly recognised when on 26 April 2013, the IMU's Kampong Angkat Project (KAP) or Village Adoption Project at Kampong Tekir, Malaysia was awarded the first place in the MacJannet Prize for Global Citizenship, beating 65 other universities globally in recognition of exceptional student community engagement initiatives. This augurs well for the quality and relevance of our undergraduate programmes within the community.

6.7.5 Dissemination of Knowledge

Dissemination of knowledge occurs through delivery of our undergraduate and graduate academic programmes, through scholarly publications, communications, and continuous professional development activities to peers (through the IMU Centre for Lifelong Learning and the IMU Centre for Education), through community and outreach programmes for public education, and through industrial partners for commercialisation of research products, consultancies and services.

Knowledge generated in the IMU unlike universities which have other technical (physical, chemical, engineering, architectural sciences) and business faculties, is not consciously evaluated as a potential contributor to the returns on investment for the university. This may be because a medical and health sciences university is not directly related to industries and businesses. However, most academics know the value in dissemination of knowledge through publications in scientific journals or as books on various specialised topics. Faculty members are actively involved in publications and the IMU has its own International e-Journal of Science Medicine and Education (IeJSME) to disseminate academic information to the wider community of scientists and other health professionals. The IeJSME which was first started in 2007 is now in its Volume 9 with 3 issues per year. Publications in learned journals in addition to its role in disseminating new knowledge serves to draw attention to the research quality of its faculty members and indirectly contributes to the academic standing of the university.

6.7.5.1 Within the Organisation

It is proposed that a comprehensive audit of knowledge and their market value be generated. An updated dossier of categorised 'knowledge and their products should be prepared and this should be made available for information to all faculty members. The generation of this list and their categorisation will serve as resource not only for strategic planning but also help in identifying the knowledge base with commercial potential.

6.7.5.2 Outside The Organisation

Utilisation of knowledge products by external organisations depends on a number of factors. Amongst these are information on the availability and utility of these products and their perceived value. Marketing the appropriate information to potential customers is an art as well as science and needs the

services of a scientific communications officer who can translate scientific data and research findings into readable and attractive information on the value and applications of the findings. Obviously, this unique skill is scarce and the IMU must have this expertise if it wants to maximise public understanding and perception of the value of its knowledge products.

6.7.6 Indicators and Measurement of Impact

6.7.6.1 Educational Programmes

Success of educational programmes including formal and informal programmes (e.g. continuous professional development (CPD) programmes, short courses, etc.) can serve as an indicator of successful management and utilisation of collective knowledge of a university. The success and growth of such teaching and learning programmes especially where they contribute substantially to its financial robustness (e.g. IMU Medical, Dental, and Pharmacy undergraduate programmes) is an example of effective marketing of the knowledge base of the university.

6.7.6.2 Publications

The IMU has an impressive record of research publications in the biomedical areas for the last 10 years as evident in the rapid increase in publications (Abu Bakar Suleiman and Mak, 2013; Table 6.6).

Publication of research findings serve a number of functions other than documenting and interpreting the research results and their contributions to new knowledge. They draw attention to the quality of academic pursuits in a university which directly or indirectly impact on the choice of undergraduates and graduate students, and faculty in joining, and external agencies in sponsoring and funding research (Figure 6.3).

Table 6.6 IMU research publications and scientific presentations, 2009 – 2014

Year	Presentations			Publications			Impact Factor	
	Oral	Poster	Total	Indexed Papers (with IF)	Others including books/ chapters	Total	Total IF	IF/Indexed Paper
2009	149	80	229	48	66	114	122.159	2.545
2010	130	71	201	81	65	146	206.006	2.543
2011	180	96	276	116	96	212	274.029	2.362
2012	78	55	133	82	67	149	148.298	1.809
2013	166	75	241	162	28	190	255.382	1.577
2014	143	65	208	203	86	289	340.180	1.676

*SJR/ISI Journals: SCImago Journal & Country Rank/ISI (Thomson Reuters)

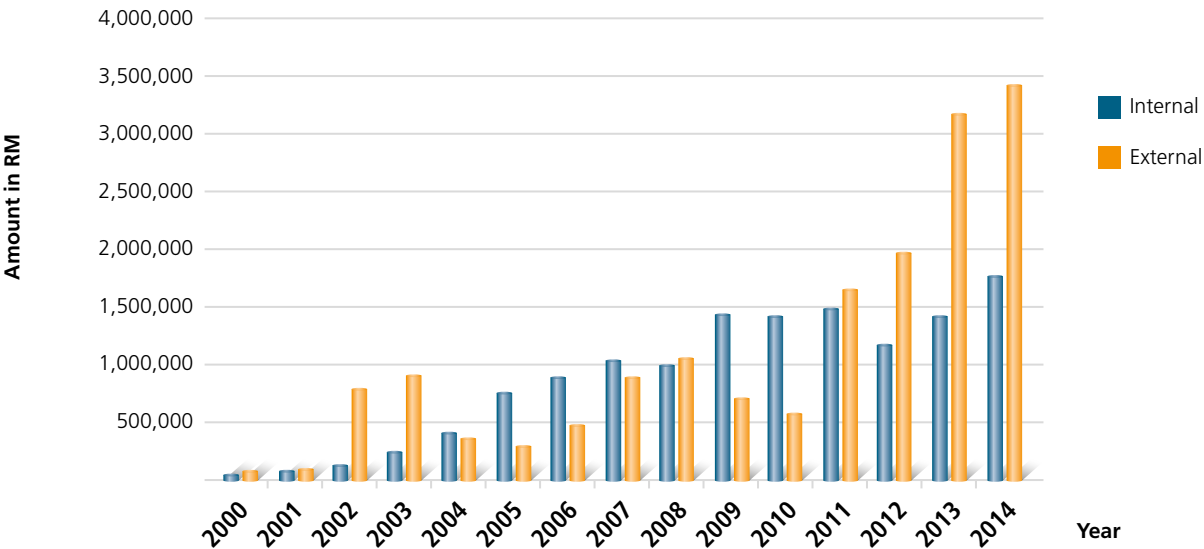


Figure 6.3 Total amounts of external and internal funding obtained by the IMU between 2000 and 2014.

6.7.6.3 Commercialisation

Commercialisation of research findings and products has frequently been listed as a target of universities. The filing and securing patents based on research results have been equated with the quality and maturity of the research activities in a university. Patents if successfully secured may have potential commercial value if this is translated into applications or products. Patents, tests, services, and consultancies are part of knowledge products which have direct and indirect commercial value.

Research products which are currently available such as biological isolates (protozoa, algae, dust and storage mites, etc.), recombinant proteins (allergens and other fusion proteins), and monoclonal antibodies if properly marketed can contribute to the commercialisation of the knowledge base of the IMU.

Services mainly in the testing for environmental pollutants were started in 2012 and are by far the most successful of our attempts at commercialisation. This has been possible because of our successful collaborative partnership with an industrial partner in the environmental area.

Consultancies and contract research mainly in the area of bioactive compounds, nutrition and cancer research have been fairly successful. These contracts have been from industrial partners or multinational companies. Other contract research projects include clinical drug trials which were funded by multinational and local pharmaceutical companies.

6.7.7 Best Practices and Objectives

An academic institution, especially a learning organisation needs to generate knowledge and be conscious of the fact that such knowledge is a valuable asset which must be managed and marketed to maximise returns. The returns from the management and utilisation of the knowledge

base available in an academic institution are in various forms, the most obvious being in the delivery of academic programmes at the undergraduate and graduate levels, short courses, and CPD programmes.

Commercialisation of research results, consultancies, testing services, and contract research can if appropriately marketed, not only generate financial returns but also increase the profile and perception on the relevance of the university. The products of its knowledge base, especially graduates of its academic programmes will reflect the quality of the university. There must be a mechanism to identify, collate, evaluate, manage, and disseminate relevant information, and market knowledge and expertise available within the organisation. While it may be more efficient to identify a focal point for this important task, all generators of knowledge must be aware of the importance of their role in the whole process of creation, dissemination, translation and application of knowledge. Knowledge unless utilised for the benefit of mankind remains unfulfilled.

Increasingly important areas are community, social and outreach programmes that all organisations, including academic institutions are rapidly involved with. These are important for institutions as the measurable and intangible outcomes from such programmes can be far reaching and have greater impact than the stated objectives. These place the university within the context of the community and allows the community to evaluate its relevance and provide learning opportunities not available within the confines of the institution.

6.8 Conclusion

The IMU as an academic institution has been and must continue to be actively involved in knowledge generation, dissemination, and utilisation. It has been doing this throughout its 23 years of existence and in the last 12 years has been actively engaging in research which

potentially can accelerate knowledge creation and expand the knowledge base. In terms of teaching and learning, the educational philosophy of the IMU is well aligned with its eight key learning outcomes as well as its vision and mission. Various tools (e.g. e-learning), especially with the advent of Web 2.0, have been actively utilised in the pursuit and dissemination of knowledge in the IMU. A culture of inquiry needs to be further enhanced in the IMU as a learning organisation. While knowledge in all its forms has increased tremendously over the years, there has not been active management of all knowledge produced by faculty members. During the last two years, a number of steps have been taken to manage and market knowledge and expertise through formation of IRDI, ICE, ICL, and linkage with industrial partners. A relatively new but gratifying initiative has been the tremendous success of the IMU's community service. This harnessing and application of collective knowledge for service to meet the needs of the community has been recognised internationally.

Building a robust scholarship such as the SOTL is greatly needed in the IMU, which will not only skilfully explore the frontiers of knowledge, but also integrate ideas, connect these thoughts to action, and inspire students. The very complexity of modern life requires more information and participation. Therefore, the IMU as an academic institution needs to build a community of scholars to help students see beyond themselves and better understand the interdependent nature of our world and live responsibly, with dignity and purpose; not only to generate new knowledge but to channel that knowledge to human ends to help shape a citizenry which will promote the public well (Boyer, 1997).

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ROLES OF THE PROFESSOR IN THE PAST, PRESENT AND IN THE FUTURE

Frederick Charles Smales, Kandasami Palayan and Davendralingam Sinniah

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The IMU Experiment



7.1 Background

1. The ‘Roles of the Professor’ Task Force has been established at IMU to conduct interviews with distinguished professors in Malaysia and Singapore thereby generating insights to guide the activities of the IMU Professoriate. The detailed remit is reproduced in Appendix One. An earlier paper prepared for Senate has been a valuable resource for the Task Force.
2. Structured interviews with four key questions were conducted. Seven external professors and two IMU professors were each interviewed by two or more members of the Task Force. Biosketches and photographs of the interviewees are given in Appendix Two.
3. Task Force members held several meetings to discuss matters relevant to the production of this report. Topics discussed included: ideas regarding the origins of professorial roles; a system for collation and analysis of the interview responses; and some suggestions about the most effective choices of roles of the Professoriate at the IMU in the future.
4. Question One was designed to be an ‘ice breaker’ by asking about initial achievements upon becoming a professor. Unsurprisingly it produced widely varying responses. However the interviewees were unanimous in regarding conferment of a professorship as carrying an early obligation to use the prestige to bring about a tangible contribution to society.
5. Question Two was a five-part question regarding the important roles of a professor. Whilst there were differences in prioritisation, marked agreement was seen on what the five qualities should be. Teaching and research excellence were highly regarded, as were

international reputation, communication skills and advancement of the speciality.

6. Question Three addressed roles of the professor which would be of increased importance in the future. The responses in general did not break new ground but tended to reinforce the roles identified in the answers to Question Two, with international reputation being stronger emphasis. Also community profile and contributions together with leadership and mentorship, were regarded as becoming increasingly important in future.
7. Question Four asked about roles needed of professors in Malaysia to enable the country to meet international competitive challenges. Many of the interviewees mentioned the pressing need to have more academic leadership of international standards with those professors also being capable of communicating their ideas within the national setting.
8. Inspection of the responses showed that identified roles or qualities could be placed in two groups. One group were front-line roles, the other group, inherent qualities; these are subsequently used in this report as the basis for analysis and recommendations.
9. The material was subjected to a simple weighting analysis to reveal trends. In summary, that gave the top five roles needed currently, (Question Two), as:

1. Research Excellence and Innovation	41 points
2. Teaching Excellence and Innovation	33 points
3. International Reputation	15 points
3. Communication Skills and Networking	15 points
5. Advancement of Speciality	14 points

Front Line Roles	Teaching Excellence and Innovation Research Excellence and Innovation Speciality Service Delivery Organisational Activity Separate from Above Advancement of Speciality
Inherent Qualities	Leadership, Mentorship and Adaptability High Ethical Standards Communication Skills and Networking Community Profile and Contributions International Reputation

10. It was considered that in the future the above roles would continue to be important (Question Three), but additionally, two roles would have increased relevance. These were:

- 1. International Reputation 29 points
- 2. Community Profile and Contributions 14 points

11. A notable absentee from the highest rankings was Special Service Delivery. That will attract the attention of those whose academic calling is in the area of healthcare delivery, especially at a medical university like the IMU, and who will rightly believe that quality needs some sort of emphasis in roles of a professor for such individuals. This important matter merits special discussion and that is done in the conclusions section of this report.

12. For a reality check of the findings from the interviews the Task Force investigated the origins of the term ‘professor’ and the roles undertaken by some scholarly figures in history. To enable further discussion the findings have been summarised in a table entitled ‘The Stripped-Down Professor’ reflecting the historical view. To allow comparison, the features of ‘The Macfarlane Professor’ proposed in the Senate Paper are shown in a similar table.

13. The document concludes with suggestions for further investigations and activities regarding this important and interesting topic. Also some initial conclusions the authors have drawn from the findings, including those concerning members of professional groups like clinicians, are briefly discussed with regard to their relevance to IMU and Malaysia.

7. 2. The Questions and the Interviewee’s Responses

- 1. Question One: Having been appointed a Professor what do you regard as having been your first significant achievement in that role?
- 2. This was designed to be an ‘ice breaker’ by asking about major achievements upon becoming a professor. Unsurprisingly it produced widely varying responses. However the interviewees were unanimous in regarding conferment of a professorship as carrying an early obligation to use the prestige to bring about a tangible contribution to society.
- 3. Question Two: List five important qualities that should be observed in all Professors and those applying for the position?

4. Question Two was a five-part question regarding the important qualities of a professor. Whilst there were differences in prioritisation, marked agreement was seen on what the five qualities should be. Teaching and research excellence were highly regarded, as were international reputation, communication skills and advancement of the speciality.
5. Question Three: From the changes you have noted in higher education globally, what are the issues that would be relevant to the appointment of professors and the roles of professors in future, locally, regionally and globally?
6. Question Three addressed the roles of the professor in the future. The responses in general did not break new ground but tended to reinforce the qualities identified in the answers to Question Two, especially international reputation. However community profile and contributions together with leadership and mentorship, became quite prominent.
7. Question Four: What are the challenges facing Malaysian Universities and Malaysian Professors striving to be on par with top international institutions?
8. This question asked about qualities needed of professors in Malaysia to meet international competitive challenges. Many of the interviewees mentioned the pressing need to produce academic leaders of international standards capable of communicating their ideas within the local setting.
9. The detailed responses are shown below.

Question 1: Having been appointed a Professor what do you regard as having been your first significant achievement in that role?

A. Tan Sri Dato' Dr Syed Jalaludin Bin Syed Salim

My initial achievements as a Professor had their roots much earlier when I realised I had to be academically pro-active despite being still a lecturer. An early success was getting a research student upgraded to a PhD, (a big deal in those days). Senior colleagues noticed how I did that and began to approach me about my becoming Dean. So I became a Dean before being conferred with a Professorship. When that came later at UPM I found the prestige made me a person who had to accept national roles in the forming of regulatory frameworks constructed for agriculture and veterinary science in Malaysia.

B. Tan Sri Dato' Professor Augustine Ong

Having had a background in the study of free-radicals it was suggested to me that I use the opportunity of a new post with the promise of a professorship to establish a new area of study. That was done by establishing a multi-disciplinary group to work on palm oil in all its aspects, including championing its benefits e.g. to major bodies like the US FDA.

C. Tan Sri Dato' Professor Dr Sharifah Hapsah Syed Hasan Shahabudin

Initially working in Physiology in the area of cardiovascular research and exercise physiology, I was able to promote exercise programmes to the police force to improve their health lifestyle. Then moving on to medical education brought in ideas for CME credits for renewal of practitioner registrations.

These experiences illustrate a need for the professor to do research leading to them becoming known as academics, but also using the work to benefit people.

D. Professor Dato' Dr Mahmud Mohd Nor

Becoming a professor meant being available to take a leadership role in establishing a local programme for the training of surgeons. The effort began in 1981 and has been on-going since then mainly because of the large number of stakeholders.

The matter was at cabinet level at certain points and that allowed UKM to pioneer some features of the training. A significant point was that a research component was included in the proposed local training scheme.

Gratifyingly, a supreme Conjoint Board has recently been established with the agreement of government and representation of appropriate bodies which provides all aspects of the training and its assessment.

E. Professor Dato' Dr Khalid Abdul Kadir

I became a Professor and the Dean of Medicine at UKM at the same time. I was able to change the 6-year MBBS Curriculum to a 5-year one aligned to international standards. Also I established Internal Medicine as a national programme, a degree of Master of Medicine in Paediatrics, and promoted a higher status for Family Medicine. Later I became Foundation Professor of Monash University establishing the Johor Clinical School.

F. Professor Emeritus Tan Sri Dato' Dr Zakri Abdul Hamid

My background is in plant genetics with my PhD obtained from the University of Michigan in 1976.

On return to Malaysia, I directed my research towards producing high-yielding pathology-resistant tropical crops, for example soya beans. Eventually work in that field led to me becoming Secretary General of SABRAO, the Society for the Advancement of Breeding Research in Asia and Oceania.

Local, regional and international advisory and committee roles have continued throughout my career, and I will refer to some aspects of those activities later in the interview. Currently I am Chair of the National Professors' Council in Malaysia and that is a good position for me to make comments on your topic.

G. Professor Tan Eng Chye

The requirements for promotion to full professor and for tenure are very high at the National University of Singapore. The proportion of full professors in tenure track faculty is about 15%. There is not really a revelatory moment here when one becomes a full professor. That moment comes within the period of associate professorship as one strives for the full substantive post. As such, I cannot identify one achievement ahead of a number of others.

H. Professor Victor Lim

I was appointed Professor at the age of 39 years. As a young and enthusiastic new professor I would consider my most significant achievement was to play a lead role in the establishment and implementation of a new medical curriculum at Universiti Kebangsaan Malaysia. It required a systematic approach, much diplomacy and the support of top management.

I. Professor Mak Joon Wah

It was having opportunities for regular contact with graduate students so I could mentor and inspire them on a regular basis. (Undergraduate students should be mentored by other staff). In particular to stimulate them to apply critical thinking processes to their researches and other academic matters. In such roles professors must be passionate, not reserved. To be able to function effectively in that way, professors must of course have demonstrable mastery of the core knowledge of their chosen field.

Question 2: List five important qualities that should be observed in all Professors and those applying for the position?

A. Tan Sri Dato' Dr Syed Jalaludin Bin Syed Salim

- a. Acceptance by peers in their speciality for having advanced it in some significant way. The area can be narrow, but the advancement must be to highest standards.
- b. *Dynamic and effective leadership in research supervision:* so that others can carry on the work of advancing that and similar or cognate specialities.
- c. The ability to network and interact with other professors and senior colleagues rather than choosing to be reserved and withdrawn regarding their academic calling.
- d. Regularly publish research results in critically reviewed journals. In the case of distinguished clinicians a similar expectation of case studies with interesting content.

- e. Meet the expectations of the community with regards to Professors and strive to be a person of high calibre with a presence nationally and internationally in their subject.

B. Tan Sri Dato' Professor Augustine Ong

- a. Above all original thinking should be evident, not just repetition of earlier knowledge. An example from palm oil research is the idea that it is the position of the saturated fat chain in the triglyceride molecule which determines blood cholesterol effects.
- b. A capability to conceptualise or synthesise new ideas in such a way as that above so these can be used to communicate discoveries to others and stimulate the desire for further investigation.
- c. A flair for managing and enthusing staff to want to do academic work because they are stimulated by the possibilities rather than pressuring or dominating them. In particular have regular contact, daily or more with supervised research students.
- d. Have a wide range of interests and curiosities, bringing those to bear on problems of the community and their solution by scholarly and organisational methods. Note that in addition to being altruistic, such activities often lead to legitimate self-benefit.
- e. Be passionate about academic activity and research, and use that to drive the teaching and administrative requirements of the professorial role, for which there will always be difficulties in finding the necessary time.

C. *Tan Sri Dato' Professor Dr Sharifah Hapsah Syed Hasan Shahabudin*

- a. Must have shown ability in both teaching and research but then can choose to major in one or the other. In each case the work done should have practical utility.
- b. Have to be adaptable and flexible so as to be able to respond to challenges which may arise. Note that there may be a requirement to change direction but whatever is done must be of excellence academically.
- c. Upon appointment professors should be expected to spend 70% of their time conducting high quality research. Subsequently that can be reduced if they wish, the time being made available being used for other academic and academic-related purposes.
- d. If research is pursued then there should be a capability to generate a good flow of high quality research papers in international journals.
- e. If teaching is being pursued a substantial proportion of that effort by those of professorial rank should be directed towards the teaching and mentoring of postgraduate students.

D. *Professor Dato' Dr Mahmud Mohd Nor*

- a. The professor must be a champion and expert of an area of academic expertise which can be 'professed'. The expertise should be evidence-based and referenced against criteria.
- b. Teaching is an important function and there should be passion for that activity. Newly appointed

professors should be required to give a public inaugural lecture to introduce their academic area to faculty and the wider audience.

- c. Research activity of a very high standard must have been demonstrated prior to appointment. It must continue at a productive level to pass above internal bars, and it should be of the top international standard to clear the upper-most bar.
- d. The individual should excel in the service aspects of the chosen speciality, particularly in the case of a clinician.
- e. The individual should be active in the administration and development of his or her professional group and also contribute to the community in an appropriate way.

E. *Professor Dato' Dr Khalid Abdul Kadir*

- a. Be acknowledged by peers as among the best in their field by virtue of a) publications, b) for clinicians, clinical acumen and c) research as determined by publications and KPIs. Be at least three years post achievement of PhD.
- b. Have qualities necessary for excellent teaching, using an evidence based-approach and achieving high levels of confidence among the students taught.
- c. Be able to set standards in their chosen field of academia, as necessary for peer review and for international recognition as well as gaining appropriate research funding.
- d. Be able to effectively mentor and supervise doctoral students studying and research for the

award of the PhD degree with evident success in that area.

- e. Show leadership in the relevant professional body and by that and similar means make significant contributions to the community.

F. Professor Emeritus Tan Sri Dato' Dr Zakri Abdul Hamid

- a. Candidates for professorship must show excellence in research with publications in peer reviewed international journals. Universities in Malaysia have that as common practice, seeking confirmation by local and international referees of distinction to approve appointments to professorial level.
- b. No less important is a high level of teaching ability which should be inspired by the individuals own academic work otherwise there is nothing to differentiate the professor from a gifted school teacher or a lecturer at a purely teaching college.
- c. Strength in academic networking is extremely important, with involvement in organising conferences a useful entry point when it is at local level initially, but it should then broaden out to regional and international activity. Personal contacts arising from such work are very valuable.
- d. There should be a consistent pattern of presentations at conferences again ascending through the levels of local, regional and international events. An interesting development in that regard are some international bodies in which I have played some roles which are well suited to Malaysian academics, including the Third World Academy of Sciences or, THWAOS, and the Islamic World Academy of Sciences. Each have a number of Nobel Laureates in their ranks.

- e. Although some very distinguished academics are disdainful of the need for any practical relevance in their work, most members of the scholarly community would consider that professorial activity should make a contribution to the well-being of society. For example some social scientists might work on national unity, healthcare professionals on preventing Ebola-type outbreaks and so on. A guideline would be 5% – 10% of time should be used in that way.

G. Professor Tan Eng Chye

- a. A balanced awareness of the equal importance of both research and teaching, coupled with a very superior level of accomplishment in one, and quite a high level in the other.
- b. Strong in independent thought and action, that is, a leader and not a follower. This involves 'thought leadership' in contradistinction to 'academic leadership' (see below). 'Thought leadership' comprises both capability and perseverance to continuously break new ground as a researcher, or as a teacher.
- c. Integrity - as demonstrated by some unfortunate examples which are coming to light from around the world, - is an essential quality for all academic staff.
- d. 'Academic leadership' which refers to the administrative capabilities of an individual. This can be demonstrated, for example, in terms of introducing new procedures to improve university operations, or successfully taking on the role of a head of department or a dean. This quality is hard to find. At NUS, heads and deans are appointed,

never elected, and very often, we also look for qualified candidates from around the world.

- e. Service excellence – In some fields, there is a need to give due recognition to excellent service. This is most evident in extended clinical training which has to be undertaken in medicine and dentistry.

While 'super research' may compensate for some weakness in teaching achievement, and occasionally 'extremely super teaching' may compensate for weak research achievement, 'super service' can never compensate for weak research and weak teaching achievement.

In this regard, academics in medicine and dentistry who aspire to achieve full professorship at NUS can be on one of three tracks, i) the regular track, which is similar to that for all other academics, ii) a clinician-scholar track where less time is devoted to research and iii) a clinician-scientist track.

H. Professor Victor Lim

- a. An enthusiasm for teaching with evidence of being abreast with best practices in learning and assessment as well as commitment to teaching scholarship. A scientific approach to teaching and learning should be apparent.
- b. An acceptable record of participation in research and publications. However for good and dedicated teachers, research does not need to be at world-class level for a professorship.
- c. Recognition both nationally and regionally as an expert in one's field of specialisation. That is particularly the case for clinical academics.

- d. Plays a prominent role in developing standards of one's discipline/speciality in the country.

- e. Plays an active role in community service.

I. Professor Mak Joon Wah

- a. To be able to teach effectively and to stimulate discussion. To demonstrate the qualities of humanity and professionalism while undertaking such tasks.
- b. To be actively researching in the area in which they are teaching, with the motivation that scientific enquiry is both a pleasure and an obligation.
- c. To be a role model and display high ethical standards. Explain the application of appropriate values and standards to their calling.
- d. Be an advocate and reference point for their subject. Keep themselves up-to-date with developments. Make themselves readily available to provide advice in that area.
- e. Be able to synthesise and integrate information from their chosen subject to provide new insights and paths for future development.

Question 3: From the changes you have noted in higher education globally, what are the issues that would be relevant to the appointment of professors and the roles of professors in future, locally, regionally and globally?

A. Tan Sri Dato' Dr Syed Jalaludin Bin Syed Salim

Standards expected for the appointment to a professorship have not changed. Those so appointed

must be of the same standards as in the best institutions worldwide.. Similarly, internal promotions to professorships must involve several international assessors. These are necessary safeguards for an institution which wishes to gain and retain international respect. Note that anyone can quickly establish the qualifications of a professor on the internet.

B. Tan Sri Dato' Professor Augustine Ong

- a. Candidates should be excellent in scholarly research leading them to being regarded as an expert in their area, especially finding solutions to local and regional problems.
- b. Scholars who one day will exceed the current expectations of a professor should be particularly nurtured and given the chance of advancement.
- c. Individuals should keep in touch globally, for example some Japanese scholars ensure that they travel to meet academic colleagues at least every two years.

C. Tan Sri Dato' Professor Dr Sharifah Hapsah Syed Hasan Shahabudin

At the present time with the expansion of higher education in the country there is a need for more professors to provide leadership and mentoring. A solution for the present is to have three levels within the professorially grade. C is basic and B is only reached after solid research performance. Books can count as equivalent to research articles. A is only reached with external international assessment and many citations of published work.

The title should be reserved for academic merit as above to maintain international credibility. The grade of clinical professor should be discontinued. Alternate titles for individuals of distinction in other fields entering universities include Fellow and Senior Fellow.

D. Professor Dato' Dr Mahmud Mohd Nor

The role of the professor is changing from someone who carries out their scholarly functions in isolation to that of a person with the skills to collaborate meaningfully with other colleagues especially those in other universities.

The vision has got to be of a borderless world from the academic viewpoint and one where the information technology dimension of activity is very important.

E. Professor Dato' Dr Khalid Abdul Kadir

There is good reason to think that Malaysia has not set its standards correctly for Professorships and also not implemented the international standards followed by Western nations and Australia.

F. Professor Emeritus Tan Sri Dato' Dr Zakri Abdul Hamid

A main issue for the appointment of professors in future is possession of high ethical standards which will direct the individual towards work of relevance and innovation. Such a view should be captured in the rubric defining professorial roles. A second issue here in Malaysia is of course 'league' tables. The requirements for those who will aspire to professorships in a few years' time could be developed so their preparatory work could address league table requirements.

G. Professor Tan Eng Chye

- i) The trajectory of quality and quantity of research of a candidate has to be assessed. If it is considered that research has peaked then an appointment would not be made on the basis of past performance. The candidate should be capable of achieving substantial breakthroughs in the future.
- ii) It is essential to use external reviewers who must be from universities which are peers of the best universities worldwide, and have achieved excellence themselves.
- iii) Salaries offered must be globally competitive and if there are budgetary limitations, the number of full professor positions available should be reduced to meet or maintain that level of remuneration.
- iv) Localisation, i.e. preferential appointment of those who are citizens of the country or those living in a locale, cannot be practiced if international excellence is to be achieved, and the reasons for that have to be carefully explained to the public and justified.

In NUS, steps are taken to nurture local academics and many of them have demonstrated great potential during the open and competitive search process. The University sends talented local students to pursue PhD studies in top research centres around the world and they form a pipeline of young academics who can contribute to the university community when they complete their studies. Based on our experience, Singaporeans do perform credibly in recruitment and promotion exercises.

Furthermore, the University searches worldwide to identify Singaporeans who have achieved full

professorships at peer institutions and we try to persuade them to return to contribute to the academic and research community in Singapore.

H. Professor Victor Lim

Professors would have to be leaders of, and contributors to, society, and be able to influence national policies and be champions of social justice.

They will also be leaders of education and lead changes in the education system not just at tertiary level but also in schools. It is particularly important they are involved in innovation.

They should be role models for their younger colleagues and play the role of active mentors.

They should be producers of useful knowledge that will improve the wellbeing of the community and not indulge in research just for the purpose of producing publications.

Institutions needing to retain and recruit good teachers who may not reach international standards for professorship have a problem. However they should try to alleviate that by the following strategies:

- a. Decouple salary from the title in selected situations giving a higher salary than is merited by the level of academic appointment.
- b. In medical universities use the title of Clinical Professor for able clinicians who do not rise to higher requirements of academia for research activities and teaching innovation.

- c. Use the title of Adjunct Professor for those who have been successful in their careers outside of academia and wish to transfer to university life on a part-time or full-time basis.

I. *Professor Mak Joon Wah*

Within the University the professor must be visible, participating fully in both academic and extra-curricular activities. At national level endeavour to gain membership of national committees which supply informed advice to policy makers. At all levels seek to have a presence on the internet, not just to project personality, but to contribute to thinking in one's subject area. Aim to demonstrate membership of international network(s).

Question 4: What are the challenges facing Malaysian Universities and Malaysian Professors striving to be on par with top international institutions?

A. *Tan Sri Dato' Dr Syed Jalaludin Bin Syed Salim*

The quality of academic leadership which will come forward in the future is the crucial issue. Those aspiring must have advanced their subject, publish the results and have been accepted as a leader in that area internationally. With that as core they should then display the related qualities of inspired academic leadership and management to develop their institutions.

B. *Tan Sri Dato' Professor Augustine Ong*

- a. Getting the very best academic leadership, including from that available on a worldwide basis
- b. Ensuring that real talent is properly recognised and getting societal and government support for that

- c. Making sure that the requirements of a professor are properly balanced with the saying 'think global, act local' being born in mind.

C. *Tan Sri Dato' Professor Dr Sharifah Hapsah Syed Hasan Shahabudin*

There is pressure on funding from government especially for operating costs. Some politicians are sceptical about the benefits gained from funds for universities. Governments are more responsive to requests for funding for developments.

Professors in times past could work alone but now they must become centres of activity of talented individuals who they inspire and guide. The team members should align their activities with the themes of the research group they are assigned to so that excellence is achieved in that area and gains international recognition.

Succession planning is very desirable and strategies need to be put in place to retain and develop young talent and retain it in the country, whilst also attracting talent from abroad.

D. *Professor Dato' Dr Mahmud Mohd Nor/*

The worldwide university ranking systems have to be coped with and that presents a big challenge to countries where the universities and the professoriate have to balance academic excellence efforts with the needs of the nation.

Part of the answer is to look for subjects for which the national system has an aptitude and focus resources on those areas to achieve excellence at international level.

Finally shaping the intellectuals of the country is also a big challenge, both so they can give account of themselves to the benefit of the reputation of the country, and to produce the ideas and products that will drive the economy forward.

E. Professor Dato' Dr Khalid Abdul Kadir

Means are needed to appoint fully accredited Professors with the leadership qualities necessary to set the standards in Universities particularly those involving research so that full recognition will be achieved in league tables which have international respect.

F. Professor Emeritus Tan Sri Dato' Dr Zakri Abdul Hamid

One challenge to Malaysian universities is how to maintain the current high standards of teaching, yet give faculty enough time and resources to do the high quality research that will gain respect from the rest of the academic world. One solution may be to set up interdisciplinary teams to work on specific areas – that is not trying to be good at every research area.

A second challenge for Malaysian professors is to be sufficiently well regarded to be advisors on policies and treaties, including invitations to serve on intra-governmental panels on matters like climate change, biodiversity and ecosystems, etc. It is interesting that the idea harks back to a major role of some early natural philosophers who often were trusted advisors to the rulers in those days.

G. Professor Tan Eng Chye

For universities to achieve excellence at a global level, the recruitment of full professors should be extended to applicants from around the world. There should be

clear and transparent articulation of the high standard of scholarship required and the salary levels offered should reflect that.

In Singapore, universities are incorporated as not-for-profit companies since 2006 and we are given the autonomy to chart our strategic directions and mobilise our resources. Local autonomous universities receive 70% of their funding from the Ministry of Education and missions of the universities are expected to be aligned with Singapore's strategic objectives.

Universities have the flexibility to develop strategies to meet those objectives, and there is no micro-management.

Finally the universities have to conduct their activities in a fully transparent matter so they can be held publicly accountable for how they seek to achieve their goals.

H. Professor Victor Lim

The major challenge is a dearth of academic leaders. Many of the institutional heads are appointed based on political reasons rather than academic prowess and therefore lack the respect of the faculty.

Because of excessive political interference and the lack of resources in local institutions the very best have generally moved to institutions overseas where they have shown their ability to compete on a level playing field.

I. Professor Mak Joon Wah

To import the very high standards seen in the world's leading universities. The analysis of the performances of some internationally acclaimed higher learning institutions and then benchmarking both self and one's

department against the outcomes. Make the process visible, apply the lessons learned and seek feedback on progress from external examiners and experts.

7.3. Analysis and Comments Regarding the Interviewee's Responses

1. Question One, the 'ice breaker' question which asked about major achievements upon becoming a professor, unsurprisingly produced widely varying responses. The underlying theme of early contribution to the change-process and to society has already been noted. Beyond that, the answers to the question were not subjected to further analysis.
2. Similarly Question Four was not subjected to further analysis. It will be recalled it asked about qualities needed of professors in Malaysia to meet international competitive challenges. A broadly uniform response identified the need for inspired academic leadership and mentorship from individuals who had achieved international stature in some field.
3. Questions Two and Three required some analysis to identify the messages they contain. Nevertheless caution needs to be exercised as the responses in some cases were complex so have had to be categorised in some cases in an expedient manner. Against that background the following has been done with the responses to Questions Two and Three:
 - a. The responses to both questions were scanned and made the basis of ten roles or qualities in two groups as shown and used in Tables 1 and 2 below.
 - b. In the case of Question Two the five responses were categorised and weighted from 5 to 1 in the order in which they were mentioned, with 5 being

the first mentioned and 1 the last. For Question 3e at most two responses were given, so weightings were 2 and 1.

- c. To give a basic idea how the interviewees were thinking across the board the weighted scores were summated and those sums used to produce rankings.
- d. The results in the tables can only be regarded as preliminary at best, needing to be treated with some caution, but it does seem a pattern has emerged. If desired the categories could be made the basis of a questionnaire which could be completed by further distinguished professors in a much shorter time than each interview took. The resulting data would be very robust and could be used to draw firm conclusions.



Table 7.1 List five important qualities that should be observed in all Professors and those applying for the position.

	Roles or Qualities	Score	Rank
Front Line Roles	Teaching Excellence and Innovation	33	2
	Research Excellence and Innovation	41	1
	Speciality Service Delivery	3	8=
	Organisational Activity Separate from Above	2	10
	Advancement of Speciality	14	5
Inherent Qualities	Leadership, Mentorship and Adaptability	8	6
	High Ethical Standards	3	8=
	Communication Skills and Networking	15	3=
	Community Profile and Contributions	6	7
	International Reputation	15	3=

Table 7.1 Result of Rank Ordering

- | | |
|---|---|
| 1. Research Excellence and Innovation | 6. Leadership, Mentorship and Adaptability |
| 2. Teaching Excellence and Innovation | 7. Community Profile and Contributions |
| 3=. International Reputation | 8=. High Ethical Standards |
| 3=. Communication Skills and Networking | 8=. Speciality Service Delivery |
| 5. Advancement of Speciality | 10. Organisational Activity Separate from Above |

Table 7.2 From the changes you have noted in higher education globally, what are the issues that would be relevant to the appointment of professors and the roles of professors in future, locally, regionally and globally?

	Roles or Qualities	Score	Rank
Front Line Roles	Teaching Excellence and Innovation	5	5=
	Research Excellence and Innovation	4	
	Speciality Service Delivery	0	
	Organisational Activity Separate from Above	0	
	Advancement of Speciality	0	
Inherent Qualities	Leadership, Mentorship and Adaptability	12	3
	High Ethical Standards	5	5=
	Communication Skills and Networking	8	4
	Community Profile and Contributions	14	2
	International Reputation	29	1

Table 7.2 Result of Rank Ordering

- | | |
|--|--|
| 1. International Reputation | 3. Leadership, Mentorship and Adaptability |
| 2. Community Profile and Contributions | 4. Communication Skills and Networking |

7.4 The Origins of the Professor and Historical Roles

Introduction

1. The use of the word professor is relatively recent both regarding a type of person and as a title. According to Collins English Dictionary² the term professor came into being as a noun around 1308 and meant someone who professes to be an expert in an art or science. It was applied to teachers of the highest rank. The first recorded use of the word as a title is in 1706, possibly that being necessary to distinguish the most accomplished teachers from an expanding number of novices.
2. Thus in order to discuss professorial roles and qualities in the past another descriptor word must be sought. Despite the possibility of creating a circular argument it seem fairly safe to suggest that the term 'philosopher', particularly as applied to those concerning themselves with the phenomena of nature, is an acceptable predecessor term for professor as we now understand it.
3. In posterity such individuals were also called scholars, a term implying much more seniority and distinction that it does today. It is a good term because those so identified were using scholarly methods to produce new knowledge and ensure it was as valid and trustworthy as possible.
4. Interestingly amongst healthcare professionals the American Academy of Colleges of Nursing has articulated this with great clarity³. Essentially they suggest scholarship is the body of principles and practices used by scholars to make their claims about the world as valid and trustworthy as possible, and to make them known to the scholarly public.
5. There are a number of methods used in scholarship, with some overlapping or being refinements of others. They include: the historical method, relying on primary sources and applying criticism and synthesis; the empirical method which collects data to form a hypothesis; the experimental method which seeks to find causal relationships; and the scientific method which embodies features of all of the former, but then relies heavily on the testing of hypotheses.
6. To the rigorous application of scholarship as outlined above can be added communication skills by the methods available at the time for promulgating the knowledge discovered. Given that discussion and debate would form part of the scholarly method in their own rights that would leave careful documentation and respect for scholarly texts as a further aspect of the scholar.
7. These qualities are clearly seen in the great scholars of the past, particularly those who focussed on the topics of the healing professions. We can number Hippocrates, c370BC; Aristotle, 322BC; Aulus Cornelius Celsus, 45AD; Galen, 190AD and Abu'l Kasim Khalaf ibn Abbas al-Zahrawi in 1000AD amongst those in that tradition.
8. The available documentation does not reveal in detail the additional qualities, which must have expressed themselves in individuals who so painstakingly devoted themselves to the search for truth. Certainly advocacy, facilitator-ship, ambassadorship and community leadership must have developed in them all. To gain some insight into these possibilities brief histories of three philosophers and scholars who dealt with a wide range of subjects and topics are now given.

A. Aristotle (384 BCE – 322 BCE)

He was a Greek philosopher born in Stagirus in 384 BCE. At eighteen, he joined Plato's Academy in Athens and remained there until he was thirty-seven. His writings cover many subjects, including physics, metaphysics, poetry, theatre, music, logic, rhetoric, linguistics, politics, government, ethics, biology, and zoology. Aristotle's writings were the first to create a comprehensive system of Western philosophy, encompassing ethics, aesthetics, logic, science, politics, and metaphysics. At the request of Philip of Macedonia he became a tutor for Alexander the Great.

Aristotle's views on the physical sciences profoundly shaped medieval scholarship, and their influence extended well into the Renaissance, although they were ultimately replaced by Newtonian physics. In the zoological sciences, some of his observations were confirmed to be accurate only in the 19th century. His works contain the earliest known formal study of logic, which was incorporated in the late 19th century into modern formal logic.

In metaphysics, Aristotelianism had a profound influence on philosophical and theological thinking in the Islamic and Jewish traditions in the Middle Ages, and it continues to influence Christian theology, especially the scholastic tradition of the Catholic Church. Aristotle was well known among medieval Muslim intellectuals and revered as "The First Teacher".

His ethics, though always influential, gained renewed interest with the modern advent of virtue ethics. All aspects of Aristotle's philosophy continue to be the object of active academic study today. Aristotle wrote many elegant treatises and dialogues but the majority of his writings are now lost and only about one-third of the original works have survived.

B. Abu Ali al-Hasan ibn al-Hasan ibn al-Haytham (965 – c. 1040)

He was a scientist, polymath, mathematician, astronomer and philosopher. He made significant contributions to the principles of optics, as well as to astronomy, mathematics, visual perception, and to the scientific method. He also wrote insightful commentaries on works by Aristotle, Ptolemy, and the Greek mathematician Euclid.

Born in Basra, he lived mainly in Cairo dying there at age 74. According to one version of his biography, overconfident about practical application of his mathematical knowledge, he assumed that he could regulate the floods of the Nile. After being ordered by Al-Hakim bi-Amr Allah, the sixth ruler of the Fatimid caliphate, to carry out this operation, he quickly perceived the impossibility of what he was attempting to do. Fearing for his life, he feigned madness and was placed under house arrest, during which he undertook scientific work.

After the death of Al-Hakim he was able to prove that he was not mad, and for the rest of his life he made money copying texts while writing mathematical works and teaching. He has been said to be the father of modern optics, experimental physics and scientific methodology and could be regarded as the first theoretical physicist.

C. **Moses Maimonides (1135-1204AD)**

Mosheh ben Maimon, also called Moses Maimonides, was a medieval Spanish, Sephardic Jewish philosopher, astronomer, Torah scholar and physician of the Middle Ages. He was a rabbi, physician, and philosopher in Morocco and Egypt. His fourteen-volume *Mishneh Torah* still carries significant canonical authority as a codification of Torah Law.

He read those Greek philosophers accessible in Arabic translations, and was deeply immersed in the sciences and learning of Islamic culture. Though the Gaonic tradition, especially in its North African version, formed the basis of his legal thought, some scholars have argued recently that Muslim law, including Almohad legal thought, also had a substantial influence.

During the reign of the Almoravids, the position of the Jews in Cordoba, Spain was free of significant abuses but after another Berber dynasty, the Almohads, conquered the region in 1148, they abolished the *dhimma* status (i.e. state protection of life and wealth) in some of their territories. Maimonides's family, along with most other Jews, chose exile. For the next ten years, Maimonides moved about in southern Spain, eventually settling in Fes in Morocco. There he studied at the University of Al-Karaouine.

Following this sojourn in Morocco, together with two sons, he sojourned in the Holy Land, before settling in Fostat, Egypt around 1168. Subsequently, Maimonides was appointed the Nagid of the Egyptian Jewish community around 1171. With the loss of the family funds in a business venture, Maimonides assumed the vocation of physician, for which he was to become famous. He had trained in medicine in both Córdoba and in Fes. Gaining widespread recognition, he was appointed court physician to the Grand Vizier Al Qadi

al Fadil, then to Sultan Saladin, after whose death he remained a physician to the royal family.

In his writings, he described many conditions, including asthma, diabetes, hepatitis, and pneumonia, and emphasised moderation and a healthy lifestyle. His treatises became influential for generations of physicians. He was knowledgeable about Greek and Arabic medicine, and followed the principles of humorism in the tradition of Galen. He did not blindly accept authority but used his own observation and experience.

Maimonides in his medical writings sought to interpret works of authorities so that they could become acceptable. Maimonides displayed in his interactions with patients attributes that today would be called intercultural awareness and respect for the patient's autonomy. After visiting the Sultan's palace, he would arrive home exhausted and hungry, where "I would find the antechambers filled with gentiles and Jews ... I would go to heal them, and write prescriptions for their illnesses ... until the evening ... and I would be extremely weak".

It is remarkable that he managed to write extended treatises, including not only medical and other scientific studies but some of the most systematically thought-through and influential treatises on halachah (Rabbinic law) and Jewish philosophy of the Middle Ages. It has been suggested that his "incessant travail" undermined his own health and brought about his death at 69.

Discussion of Information in this Section

9. It is quite clear that these role model figures all combine a rigorous approach to establishing facts, which we would call research, with a wide range of interactions with communities and societies, these including teaching, publishing, mentoring and advocacy. As such they resonate well with the views of the senior Professors from Malaysia and Singapore on the necessary roles of the professor. In a later age the three scholarly individuals examined would be called ‘Renaissance Persons’.
10. Clearly however the historical figures lived at time where the complexities of society were a great deal less than they are today. As such their roles and qualities give a useful baseline or starting point, (but only that), for institutional considerations regarding the appointments, deployments and appraisals of the Professoriate. With this as a starting point therefore the qualities seen have been combined by the Task Force into a Table titled ‘The Stripped-Down Professor’ (Table 7.3).

Table 7.3 The Stripped-Down Professor.

	Roles	Characteristics			Outcomes
1	Philosophical study	natural philosophy	scholarly methods		Scholarly information
2	Informed practice	formulation of hypotheses	testing of hypotheses		Practical information
3	Discussion with peers	rigor in activities	rejection of fallacies		Quality assurance
4	Publication of information	authorship	networking		Societal well-being
5	Teaching of initiates	oral communication skills	assessment		Facilitated academics
6	Systematic leadership	in subject area	within institutions	in external activities	Societal well-being

11. Attention can be drawn in particular to two roles on the list. Firstly is publication of information, all the three historical personages considered wrote extensively and that clearly should be a role of today’s professors. Nearly all senior professors interviewed saw the need for Malaysia to achieve higher positions in the internationally-recognised University league tables and that means more peer reviewed publications arising from scholarly activities of professors.
12. The second role concerns systematic leadership within the subject area, within institutions and in external activities. All three philosophers moved in high circles because the approach to problems was respected, and they were undoubtedly influential in those settings.
- Whilst most modern aspirants to a successful and meaningful professorship will be unable to reach and influence the highest governing circles, they should be attempting to use their intellectual abilities to improve society at all levels.
13. Finally, for a broader view and to conclude this section, ‘The Macfarlane Professor’ highlighted in the Senate Paper is presented below in a similar tabular format (Table 7.4). However it is noted that some of the roles are so widely drawn that they may be difficult to apply operationally.

Table 7.4. The Macfarlane Professor.

	Roles	Characteristics				Outcomes
1	Facilitator of learning	undergraduate level	postgraduate level	faculty development		Facilitated learners
2	Researcher	lead research team	vet research proposals	generate hypotheses	source external grants	Scholarly information
3	Critic	reviewer for journals	theses examiner	external examiner	on accreditation bodies	Quality assurance
4	Leader in the Profession	advocate of profession	nationally recognised	professional organisation		Professions well-being
5	Mentor	less experienced colleagues	postgraduate students	undergraduate students		Mentored academics
6	Guardian	standards of scholarship	IMU core values	subject quality assurance		Quality assurance
7	Enabler	network access	opportunities provision			Facilitated academics
8	Ambassador	national external relations	international relations			Universities well-being
9	Intellectual leader	community change leader	national policy decisions			Community well-being

7.5 Discussion, Conclusions and the Way Ahead

1. Given the diverse backgrounds of the interviewees in this project it is interesting to see how almost without exception, independently they have converged on a particular set of conclusions. So the leading roles of the professor of today are perceived by them to be Innovative Research and Innovative Teaching. Both are well ahead of other roles and qualities; research is ahead of teaching but not by very much. The two roles resonate with the two main activities of distinguished natural philosophers of the past and suggest that not much has changed for would-be professors today in terms of fundamentals.
2. Of other roles regarded as desirable at the present time, one of the two equal third choices - International Reputation - though well behind the first two is notable as it has a special significance. It emerges as the clear leader as the role which the interviewees thought should be more emphasised in the future. If that is the case then institutions may need to facilitate that particular activity by more intensively promoting academic staff travel, time for video-link discussions and organisation of key international conferences, but only of course for those individuals who can demonstrate they have exciting messages for the international community in their subject area.

3. At position five for current roles, Advancement of Speciality is probably unsurprising. It implies that many academics should be getting out more from the secluded confines of academia, something many would agree with. It is consistent with the emphasis placed by the interviewees on Communication Skills and Networking, (third equal for current roles), and Community Profile and Contributions (second for roles with more emphasis in future).
4. Continuing the positive note regarding the outcomes this investigation, Question Four also produced quite a strong consensus. It will be recalled that was a question about the quality in professors most needed by Malaysian universities in the future. It came out to be Academic Leadership, which can be interpreted as a willingness and ability of professors to move both national and university agendas forward using the rigour of the scholarly methods to manage such processes.
5. A frequently discussed front line role which perhaps surprisingly was not prominently ranked was Speciality Service Delivery. However several interviewees observed that the role has an importance for academic personnel who have need to undergo extensive training in the delivery of clinical care to achieve a reputation in that field and thereby become eligible for a professorship. It was suggested by some of those interviewed that in those situations the requirement for performance levels in roles of the 'generic' professor should be modified. The idea is explored and discussed in the conclusions below.
6. Before moving on to conclusions, readers are reminded it was pointed out in the introduction the Task Force had clearly circumscribed aims and did not aim to conduct a study on the role of the professor or the

future of the professoriate globally. Others had already done that with success and some of the key papers have been cited. Instead the Task Force have used a novel methodology to see how the prior finding may relate to the Malaysian context.

7. One factor to be noted is Malaysia possesses a national culture where contributions to its much-admired multicultural society are strongly encouraged. In addition to other roles here the professoriate is expected to participate enthusiastically in those activities.
8. Some tentative conclusions below by members of the Task Force are in three groups:
 - Firstly, it is concluded the methodology has been fit for its purpose, and if it can be used in further investigations regarding professorial roles.
 - Secondly, as the findings of the experts have predominantly related to the 'generic' professor, those outcomes should be adapted to those individuals whose professional callings have their own well-established set of roles, amongst whom clinicians are prominent particularly at the IMU.
 - Thirdly, the findings might be used to set targets for young Malaysians so they can begin to prepare themselves to meet the criteria expected of those aspiring to membership of the professoriate in this country in the future.

Conclusions

A. The interview technique structured around four questions was a useful method of gathering qualitative information regarding roles of professors.

9. The interview procedure proved to be very straightforward with the four selected questions assisting progress. Initially, interviews were recorded but that proved unwieldy as this did not add further information to on-the-spot note-taking and was discontinued. Undoubtedly the decision to have senior professors act as interviewers facilitated matters and meant everyone was comfortable.

10. Thus, this peer-interview approach could be used for exploratory purposes on opinions regarding roles of the professor in regions where the duties of the professoriate are regarded differently to those in Malaysia and the Commonwealth countries. The Americas being the most obvious example.

B. Responses showed a high degree of consistency leading to a simple framework of roles and qualities which may prove useful for quantitative research.

11. Consistency of responses suggested to the authors that the results are true reflections of the opinions of the interviewees. Nevertheless as previously, it is pointed out that this is an exploratory investigation rather than a rigorous research project. Even so, from the results it proved possible to converge on five roles and five qualities of professors to give a workable analytical framework.

12. The convergence is an opposite approach to that adopted by Macfarlane and others. Presumably as a mind-broadening exercise they trawl options to find as many roles as possible. Each approach can be regarded

as valuable in tackling the issue of the activities of professors now and in the future.

13. The framework revealed by the convergent approach together with a properly constructed questionnaire, (say with the four questions in an arrangement requiring structured answers), could be used to reveal possibly contrasting views of various stakeholder groups regarding roles e.g. views of parents of students compared with the opinions of aspirants to the professorial title.

C. The interviewees noted demanding training and ongoing performance requirements for certain professionals aspiring to the professoriate.

14. Almost all the interviewees gave positive mention to the beneficial presence of members of esteemed professions either within the professoriate or aspiring to join it. However answers consistent with the option 'Speciality Service Delivery' that supported qualities related to those professions as a highly desirable role for professors were largely absent. Instead the answers led to options reflecting qualities associated with the conventional view of the 'generic' scholarship-based professor.

D. However interviewees chose to focus on the roles and qualities of the 'generic' professor, particularly scholarship, in constructing their responses.

15. The grouping with strong professional training requirements most frequently mentioned were clinicians. So the uncompromising orientation towards 'generic' requirements rather than those connected with successful prosecution of clinical work will be of interest to the IMU. There are related situations e.g. where a professional had achieved success in

commerce, industry or government also cited as not compensating for absence of scholarly achievement.

16. Thus despite the attractions of appointing certain stimulating and successful professionals to the professoriate in the absence of 'generic' qualities, the results of the investigation indicate that is not regarded as an acceptable course of action. The interviewees suggested separate titles like Senior Fellow were offered.

E. Nevertheless it was agreed that benchmarks for the 'generic' professor should be adapted for professionals with such separate performance demands.

17. There are of course professionals in the categories mentioned above who manage to fulfil generic and professional requirements. Indeed for clinical teachers it is essential that they have both types of abilities. The situation for entry into the professoriate then becomes not an absolute, but rather one of degree. The interviewees generally indicated that quantitative levels of scholarship required of generic scholars should be suitably adjusted for those who had dedicated extensive time to professional training and related requirements.

F. It is unlikely that any one criteria set will suffice for selecting future professors for Malaysia but international approval should always be required.

18. It is tempting to think that there might be an optimal set of criteria for those aspiring to the professoriate in Malaysia in the future. The opinions of the interviewees did not suggest that, in spite of the convergences noted above. Instead it is like that selection will continue to be carefully done case-by-case as it is today.

19. However high levels of achievement in research and innovation, and teaching and innovation will be needed, and those will need to be identified as being of international excellence standard. Additionally in Malaysia evidence of applying those abilities for the good of the community will also be needed.

G. An authoritative statement of a preferred achievement pattern for would-be professors, to be implemented at a future precisely specified date would improve the culture of scholarship and motivate young Malaysian academics.

20. Although it is unlikely that any particular set of criteria will become the sole pathway to the professoriate, it could be beneficial for authorities to set out a preferred criteria set which will become recognised as having particular significance for promotion to professor at a fixed time in the future, for example five years' time.

21. Those criteria and the pathway they will represent will undoubtedly be adopted by many ambitious young people and the scholarly culture represented would come into being quite quickly. At its simplest it could be a number of innovative research publications in indexed peer-reviewed journals, a number of innovative teaching publications, similarly in index peer-reviewed publications, and finally a portfolio with a specified number of scholarly contributions to the well-being of the community.

H. The last conclusion is that interest in the roles of the professor and debate about how those roles are to be promoted and encouraged will continue.

22. The terms of reference for the Task Force did not include reporting on the future of the professoriate. That will be a demanding agenda challenging to

developed nations as well as all others. However the present study does lead into that broader discussion and it will interest the reader of this report that others have been there before.

23. On the internet is the preparatory document for a 1990 programme to be conducted in America: The Future of the Professoriate - A Look in the Mirror 5. However it has no conclusions. Instead it sets more than 200 questions and issues and marshals 150 American academics to answer them. We do not know how it all turned out and if any of it was relevant to Malaysia in 2015. But it does suggest that the topic will be of continuing interest.

7.6 List of References and Sources

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Acknowledgments

The members of the Task force wish to thank the President of International Medical University, Tan Sri Dr Abu Bakar Suleiman for conceiving this most interesting project, commissioning them to carry it out and for his patience in waiting for it to come to fruition.

They also wish to acknowledge the Vice President of the University, Professor Peter Pook for inviting them to be members of the Task Force, for his continuing encouragement, and for allowing his Personal Assistant, Ms Carolyn Ng to render administrative assistance.

Finally and unreservedly the members of the Task Force state they are sincerely grateful to the distinguished interviewees for their patience, understanding and expenditure of their valuable time in giving their deep insights without which this report would not have been possible.

7.7 Appendices

Appendix 1: Appointment and Remit of The Task Force

Dear Colleagues

As you remember, the attached paper on “The Role of the Professor in IMU”, written by Professors Victor Lim and Mak Joon Wah, was discussed and adopted recently at Senate. The President of the University, Tan Sri Dr Abu Bakar Suleiman would like us to explore ways in which IMU Professors could contribute more to develop our University – IMU – to become a much stronger university. I believe he would like IMU Professors to recognise and play more active roles to transform IMU to be more relevant to our Community, Staff, Students and Alumni as well as discovering new knowledge through research and other scholarly activities etc., etc.

In view of the above, Tan Sri Dr Abu Bakar Suleiman suggested that we should nominate three Senior IMU Professors – hence you are chosen by Victor and myself – to look at the historical, modern and a model roles of a Professor through a series of external interviews with a few (perhaps half a dozen or more) distinguished Professors from Malaysia and Singapore. The candidates within Malaysia for your consideration might be Emeritus Professor Tan Sri Syed Jalaludin Syed Salim, Emeritus Professor Dato Sri Zakri Abdul Hamid who is Chairman of Majlis Profesor Negara, and Emeritus Professor Tan Sri Augustine Ong.

You might need to do some preparatory work first to prepare appropriate questions for your interviews. You should find the attached paper useful for your task ahead.

Best wishes
Peter
Prof Peter Pook
Vice President
Executive Dean, Faculty of Medicine & Health

Note: Biosketches of Tan Sri Dr Abu Bakar Suleiman, President of IMU and Commissioner of the Report and the Task Force members and Interviewers are given in Appendix Three.

Appendix 2

Biosketches of the Interviewees

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| A. Tan Sri Dato Dr Syed Jalaludin Bin Syed Salim | E. Professor Dato' Dr Khalid Abdul Kadir |
| B. Tan Sri Dato' Professor Augustine Ong | F. Professor Emeritus Tan Sri Dato' Dr Zakri Abdul Hamid |
| C. Tan Sri Dato' Professor Dr Sharifah Hapsah Syed Hasan Shahabudin | G. Professor Tan Eng Chye |
| D. Professor Dato' Dr Mahmud Mohd Nor | H. Professor Victor Lim |
| | I. Professor Mak Joon Wah |



Tan Sri Dato' Dr Syed Jalaludin Bin Syed Salim

Academician Emeritus Professor Tan Sri Dato' Dr Syed Jalaludin Syed Salim was appointed Chairman of Bank Rakyat in 2003 after retiring as Vice Chancellor of Universiti Putra Malaysia. He has a Doctorate from the University of London. Tan Sri Dato' Dr Syed Jalaludin's career spans over thirty years in academia and characterised by the many innovations in higher education and research sectors in Malaysia. In recognition of his contributions and devotions to the service, he was bestowed the National Science Laureate and title as the National Academician. Moreover, Tan Sri Dato' Dr Syed Jalaludin was conferred the Emeritus Professor by Universiti Malaysia Terengganu and Universiti Putra Malaysia.

Tan Sri Dato' Dr Syed Jalaludin continues to serve the higher education sector as the Chairman of Universiti Putra Malaysia and Universiti Tun Abdul Razak. Taylor's University has recently appointed him as its first Chancellor, and Akademi Sains Malaysia has also conferred him as a Senior Fellow. He holds the title Academician Emeritus Professor Tan Sri Dato' Dr Syed Jalaludin Syed Salim.

Furthermore, Tan Sri Dato' Dr Syed Jalaludin is involved in the corporate sector where he currently holds several positions in the public and private companies including the Halal Industry Development Corporation (HDC) as its Chairman.



Tan Sri Dato' Professor Augustine Ong

Tan Sri Dato' Pofessor Ong graduated from the University of Malaya with BSc and MSc and took his PhD in organic chemistry from King's College London. He had a full university career including being Dean, School of Chemical Sciences, and University Sains Malaysia. He was the Fulbright-Hays Fellow at the Massachusetts Institute of Technology (MIT) 1966 to 1967. He spent a sabbatical year in the University of Oxford as the Visiting Professor at the Dyson Perrins Laboratory, 1976 to 1977.

From 1987 to 1989 he was Director-General of the Palm Oil Research Institute of Malaysia and then Director in Science and Technology for the Malaysian Palm Oil Promotion Council from 1990 to 1996. He has been active in research and development specialising in the chemistry and technology of palm oil. He has 14 patents in the technology of palm oil to his credit and published more than 380 articles. He played a significant role in the programme to counter the Anti-Palm Oil Campaign from 1987 to 1989 which came to a favourable conclusion in 1989.

He is currently Chairman of the International Society for Fat Research (ISF), President of the Malaysian Oil Scientists' and Technologists' Association, a Senior Fellow of the Academy of Sciences, Malaysia, a Fellow of the Royal Society of Chemistry London and a Fellow of the Third World Academy of Sciences. He has been Founder President of the Malaysian Invention and Design Society (MINDS) since 1986. He served as a Director of HSBC (Malaysia) from its incorporation until 2004.





Tan Sri Dato' Professor Dr Sharifah Hapsah Syed Hasan Shahabudin

Tan Sri Dato' Professor Sharifah Hapsah began her career at the Faculty of Medicine of Universiti Kebangsaan Malaysia (UKM) in 1975. She became Director of the Centre for Academic Advancement and developed UKM's first Strategic Plan. She moved to the Ministry of Higher Education as Director of the Quality Assurance Division for public universities, and as Chairman and CEO of the National Accreditation Board, formulated the Malaysian Qualifications Agency Act responsible for the quality framework of higher education in Malaysia. As Chairperson of the Vice Chancellor's Committee she developed the code of university good governance to facilitate the process of autonomy in public universities. She became Vice-Chancellor of UKM in 2005, until 31st December 2013.

She is President of the National Council of Women's Organisation (NCWO) and played a leading role in developing the national policy for women. She is a prolific writer and columnist focussing on education, health and gender issues. She has been bestowed with numerous national awards and recognised internationally with honours such as the Fred Katz Memorial Medal, COL-ICDE "Award of Excellence", Honorary Doctor of Engineering from Stevens Institute of Technology, USA, Doctor Honoris Causa of Higher Education Management from University Padjajaran Indonesia and Doctor Honoris Causa in Medical and Higher Education Management from University of Alba Iulia, Romania.

During her tenure as UKM Vice Chancellor she introduced four innovative projects under the PERMATA or Jewel of the Nation programme. These are education for the gifted and talented (PERMATA Pintar), Empowerment of Youths-at-risk (PERKASA Remaja), Education for Children with Autism (PERMATA Kurnia) and the PERMATA Specialist Children's Hospital. She is currently responsible for consolidating and expanding all PERMATA programmes at the national level which also include PERMATA Insan (tafiz), PERMATA Seni for children talented in the performing arts and early childhood education and care (ECEC).



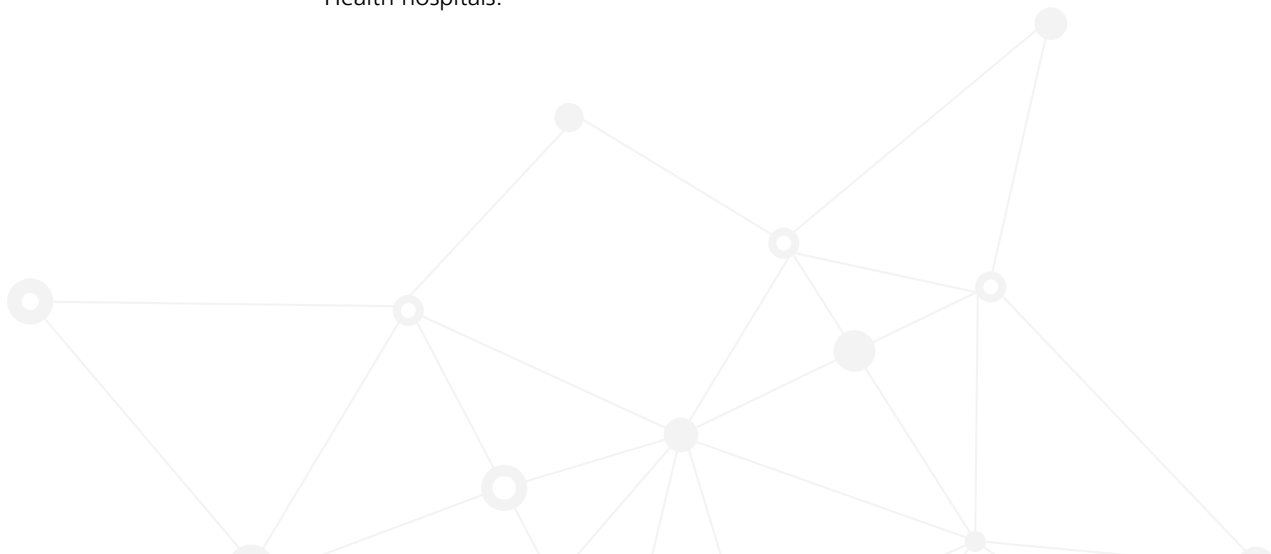
Professor Dato' Dr Mahmud Bin Mohd Nor

Professor Dato' Dr Mahmud is Foundation Professor of Surgery at Universiti Sains Islam Malaysia (USIM) and Adjunct Professor of Paediatric Surgery at Universiti Kebangsaan Malaysia (UKM). In the second batch of medical students at the University of Malaya, he graduated in 1970 and gained the Fellowship of the Royal College of Surgeons of Edinburgh in 1975. His surgical training was at University Hospital, Kuala Lumpur, The Hospital for Sick Children Great Ormond Street, London and the Royal Childrens' Hospital, Melbourne.

He began his surgical career in General Surgery and Paediatric Surgery at the General Hospital Kuala Lumpur, then relatively early in his career was made responsible for establishing the Department of Surgery at UKM. He also developed the Paediatric Surgical Service within the Department of General Surgery of Kuala Lumpur General Hospital.

He was Professor of Surgery and Dean of the Medical Faculty of UKM from 1984 to 1990. He was responsible for developing the country's first local postgraduate programme in surgery in 1981 leading to a Mastership degree in surgery. That became the pattern for all the other specialties during his tenure as Dean. He initiated the establishment of the National Conjoined Board for Postgraduate Medical Education and was the first Chairman.

In 1990 he returned to the Ministry of Health to head the newly formed Department of Paediatric Surgery at the Institute of Paediatrics, eventually becoming Head of the Institute. In 1992 - 2000 he was appointed as Head of the Department of General Surgery and Paediatric Surgery at Hospital Kuala Lumpur, carrying with it headship of surgical services in the Ministry of Health Malaysia. He has developed and upgraded the surgical services in Malaysia by establishing subspecialty services in the Ministry of Health hospitals.





Professor Dato' Dr Khalid Abdul Kadir

Professor Dato' Khalid graduated with first class honours MBBS 1975 from Monash University, Australia. He worked at the Alfred Hospital and Prince Henry's Hospital, Melbourne, where he trained for his FRACP in endocrinology and did his Ph.D. in Medicine awarded by Monash in 1984.

He is a Fellow of The Royal Colleges of Physicians of Edinburgh, Glasgow, Ireland, London, and College of Pathologist Australasia. He is also a Fellow of The Academy of Sciences (Malaysia) and Academy of Medicine of Malaysia and Singapore. In 2008 he was made an honorary Fellow of the American College of Physicians.

He joined Universiti Kebangsaan Malaysia as a lecturer in 1982. He was Dean from 1990 to 1997, and foundation Director of Hospital Universiti Kebangsaan Malaysia 1996 till 2000. He retired from UKM in 2004 as Emeritus Professor. In September 2004 he was made Professor of Medicine, Monash University in Malaysia and Head of Clinical School in Johor Bahru. His main research interests are in stress and mechanisms of adaptation to stress by hormones, metabolic stress, and the relationship of socioeconomic factors as a form of stress in diabetes.

He has published more than 270 papers and chapters in 4 international textbooks on endocrinology and diabetes and supervised 36 PhD's and Masters graduates. He was President of the Malaysian Endocrine Society from 1995 - 1998 and ASEAN Federation of Endocrine Societies from 1992-1993. He was a Member of Council, International Diabetes Federation representing Western Pacific countries in 2000. He was an elected member of the Malaysia Medical Council from 1986 till 2001, and was Master of the Academy of Medicine of Malaysia 2005 – 2008.





Professor Emeritus Tan Sri Dato' Dr Zakri Abdul Hamid

Professor Emeritus Tan Sri Dato' Zakri Abdul Hamid assumed the office of Science Advisor to the Prime Minister of Malaysia on 16 August, 2010. He was the founding Director of the Centre for Global Sustainability Studies (CGSS@USM) and is holder of the Tuanku Chancellor Chair at Universiti Sains Malaysia. He was a Professor and Deputy Vice-Chancellor of National University of Malaysia from 1992 to 2000, and was conferred the title of Emeritus Professor from the same university in 2004.

Tan Sri Dato' Dr Zakri has extensive experience in science governance at the national and international levels. He was the Founding President of the Genetics Society of Malaysia and was the Chair of the National Taskforce to formulate the 'National Policy on Biological Diversity' launched by the Government in 1998. From 2001 to 2008, he was the Director of the Institute of Advanced Studies at the United Nations University in Japan. He Co-Chaired the "Millennium Ecosystem Assessment" (2001–2005), a "mega-science" project undertaken under the auspices of the United Nations and involving 1,360 experts from 95 countries. He was also the Chair of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) for the Convention on Biological Diversity from 1997 to 1999.

Tan Sri Dato' Dr Zakri's academic interests lie in genetics, biodiversity and bio-diplomacy. He is a recipient of the Langkawi Award (1998), and is a fellow of several learned bodies: the Academy of Sciences Malaysia; the Academy of Sciences of the Developing World; the Islamic World Academy of Sciences; and the World Academy of Art and Science. Dr Zakri is a former Fulbright Scholar and is presently an Executive Board member of the Paris-based International Council for Science (ICSU) and sits on the Advisory Board of the Arab Fund Fellowship Programme.



Professor Tan Eng Chye

Professor Tan Eng Chye is Deputy President (Academic Affairs) and Provost at the National University of Singapore (NUS). His responsibilities include proposing the budget and resource allocation plan for the academic cluster; overseeing NUS Deans and their Faculties/ Schools; providing strategic directions and setting academic policies. Professor Tan is responsible for the appointment, promotion and tenure process, as well as the reward and incentive systems for academic staff.

Professor Tan has held positions of administrative leadership at Faculty and Department levels. He was Dean of Science from June 2003 to March 2007.

Professor Tan obtained his Bachelor in Mathematics (First Class Honours, 1985) at NUS and his PhD (1989) at Yale University. He joined NUS as a faculty member of the Department of Mathematics in 1985 (as a Senior Tutor). Professor Tan is an active national serviceman in Singapore, holding the rank of Deputy Superintendent of Police. He was President of the South East Asian Mathematical Society from 2004 to 2005.

Professor Tan's research interests are Representation Theory of Lie Groups and Lie Algebras; and Invariant Theory and Algebraic Combinatorics.



Professor Victor Lim

Professor Victor K E Lim is the Vice-President for Education and Professor of Pathology at the Faculty of Medicine and Health, International Medical University in Kuala Lumpur. He was the executive Dean of the Faculty of Medicine and Health from 2004 – 2011. He was the Director of the Infectious Diseases Research Centre at the Institute for Medical Research in Kuala Lumpur from 2001 – 2004 and prior to that was the Professor of Microbiology and Deputy Dean (Academic Affairs) at the Faculty of Medicine, Universiti Kebangsaan Malaysia.

He obtained his MBBS from the University of Malaya in 1974, MSc in Medical Microbiology from the University of London in 1978, and passed the Royal College of Pathologists examinations (MRCPPath) in 1981.

He was the President of the Western Pacific Society of Chemotherapy from 2004 - 2008, the Master of the Academy of Medicine of Malaysia from 2008 – 2011 and the President of the Malaysian Society for Infectious Diseases and Chemotherapy from 1999 – 2003. He is a Fellow of the Royal College of Pathologists, a Fellow of the Academy of Medicine of Malaysia, a Fellow of the Academy of Medicine of Singapore, a Fellow of the Academy of Family Physicians of Malaysia and a Fellow of the Academy of Sciences of Malaysia.

He is a member of various governmental technical committees including the National Antibiotic and Infection Control Committee and the National Medical Testing Accreditation Committee. His fields of interest include antimicrobial chemotherapy and infectious diseases and has published and presented over 350 scientific papers.



Professor Mak Joon Wah

Professor J W Mak is currently the Vice-President for Research, and Professor of Pathology, International Medical University (IMU) in Kuala Lumpur. He also holds the post of Director, Institute for Research, Development and Innovation (IRDI). He served at the Institute for Medical Research (IMR), Malaysia from 1972 in various capacities, culminating in his appointment as Director of the Institute in 1996. He was a consultant in filariasis and malaria to the World Health Organisation on numerous occasions and was the Director of the WHO Collaborating Centre for Lymphatic Filariasis based at the IMR. He was also the Dean of the SEAMEO-TROPMED Post-graduate School for Applied Parasitology and Entomology from 1991-1996.

On his retirement from IMR he was appointed Professor in the Department of Pathology, Faculty of Medicine and Health Sciences at Universiti Putra Malaysia, where he served for three years before joining IMU in 2001. He obtained his MBBS from the University of Singapore in 1967, Masters of Public Health (MPH) from the University of Malaya in 1976, and Doctor of Medicine (MD) from University of Singapore in 1980. He obtained his Membership and the Fellowship of the Royal College of Pathologists in 1983 and 1995 respectively. He obtained his Postgraduate Diploma in Applied Parasitology & Entomology (DAP&E) from the SEAMEO-TROPMED Centre, Malaysia in 1972.

He was the President of Malaysian Society of Parasitology and Tropical Medicine (MSPTM) in 1982 and the Founding Editor of its Journal, Tropical Biomedicine in 1985 and continued as its Editor until 1987. His fields of interest include tropical and parasitic diseases and he has published over 350 scientific papers. He has supervised successfully 11 MSc and 13 PhDs by research since 1978. For his contributions to parasitology and tropical medicine he was awarded the MSPTM Medal in 1981 and the Sandosham Gold Medal in 1989. He was awarded the National Science Award in 1985 and the Merdeka Award for Outstanding Scholastic Achievement in 2011.

Appendix 3

Biosketches of the President of IMU, Commissioner of the Report and the Interviewers

- A. Tan Sri Dato' Dr Abu Bakar Suleiman
- B. Professor Frederick Charles Smales
- C. Professor Dato' Dr Kandasami Palayan
- D. Professor Davendralingam Sinnah



Tan Sri Dato' Dr Abu Bakar Suleiman

Tan Sri Dato' Dr Abu Bakar Suleiman attended Malay College, Kuala Kangsar, St John's Institution, Kuala Lumpur and Geelong Grammar School in Victoria, Australia. He obtained his MBBS from Monash University, Australia. His other qualifications include Master of Medicine (Internal Medicine), National University of Singapore and the Fellowship of the Royal Australasian College of Physicians. His postgraduate training in Nephrology was at Georgetown, University Hospital, Washington DC and Prince Henry's Hospital in Melbourne (1975-1976). He attended the Advanced Management Programme at Harvard Business School in 1991.

He founded the Department of Nephrology at Hospital Kuala Lumpur, developing Nephrology and Dialysis services, extending them to other hospitals and creating the network of dialysis centres in Malaysia, in the government hospitals as well as in the community. He also developed the Renal Transplantation services at Hospital Kuala Lumpur. He became Director General of Health Malaysia from 1991 to 2001, and was appointed President of International Medical University in 2001.

Offices of distinction which he has held include President, Malaysia Medical Association (1985), Master, Academy of Medicine Malaysia (1990-1998), Founding President, Malaysian Society of Nephrology (1984-1985), Founding President, Malaysian Society of Transplantation (1996-2002), President, Association of Private Hospitals, Malaysia (2002-2008), President, Malaysian Health Informatics Association and President, National Diabetes Institute (2001-2012)

Currently he is President of the Board of Governors, National Kidney Foundation, Director and Chairman of Medical Defence Malaysia Berhad, Director of the IMU Foundation, Chairman of IHH Healthcare Berhad (PLC) and Chairman of the Board of Directors of CCM Duopharma Biotech Berhad (CCMD) (PLC).



Professor Frederick Charles Smales

Professor Frederick Smales is a dental surgeon with specialist registration in Restorative Dentistry and Periodontology. He also has interest in Oral Physiology with regard to ageing of oral tissues. Currently he is a Professor in the School of Dentistry of International Medical University, Kuala Lumpur, Malaysia.

Professor Smales read for degrees in Physiology and Dental Surgery at the University of Newcastle upon Tyne. He spent most of his working life at what is now Bart's and the London School of Medicine and Dentistry, Queen Mary, University of London. He was Dean of Dentistry from 1989 to 1994, relocating to South East Asia in 1998.

In 1998 he became the first Executive Dean of the University of Hong Kong following a world-wide search, the position being in the Faculty of Dentistry, and carrying with it the Directorship of the Prince Philip Dental Hospital.

In 2004 Professor Smales was invited to be the Foundation Dean of Malaysia's first private Faculty of Dentistry to be located at AIMST University in Kedah Darul Aman, Malaysia and also to establish a 150 chair University Dental Centre there. He was appointed Vice Chancellor of AIMST University from 2010 to 2011.



Professor Dato' Dr Kandasami Palayan

Dr Kandasami is Professor of Surgery at the International Medical University. He received his medical degree from University of Bombay in 1975 and the Fellowships from the Royal College of Surgeons Ireland, Edinburgh and Glasgow in 1980. Dr Kandasami's main interest has been in the field of upper gastrointestinal surgery.

After his surgical training in the United Kingdom, Dr Kandasami served as Consultant General Surgeon in several Ministry of Health hospitals before joining the International Medical University in 2001. He was appointed Dean of the Clinical School for the period 2004 to 2009.

Dr Kandasami has contributed substantially to the development of surgical services in the country. He has been actively involved in organising and conducting postgraduate courses and was the Chairman of the Higher Surgical Training Committee of the College of Surgeons, Malaysia. He was Deputy Chairman and is currently a member of the National Perioperative Mortality-Review Committee. He played a lead role in the development of the national credentialing system and the National Specialist Register. Dr Kandasami is Master of the Academy of Medicine, Malaysia, a past President of the College of Surgeons of Malaysia, past President of the Malaysian Society of Gastroenterology and Hepatology.





Professor Davendralingam Sinniah

Professor Davendralingam Sinniah is a paediatrician with special interest in paediatric haematology and oncology and paediatric education. Currently he is a Professor in the Department of Paediatrics of International Medical University Clinical School Seremban, Malaysia.

Professor Sinniah graduated from Trinity College, University of Dublin, Eire. Most of his working life was at the University of Malaya where he was Professor of Paediatrics in the Faculty of Medicine. He also had a period as Senior Investigator, Cancer Research Centre, University of Pennsylvania School of Medicine, Philadelphia, USA.

Since his retirement from the University of Malaya he has gone on to take on various positions including Foundation Professor of Paediatrics & Head of Department of Paediatrics, Faculty of Medicine & Health Sciences, Universiti Putra Malaysia; Foundation Professor of Paediatrics & Head of Department of Paediatrics: Melaka Manipal Medical College; Professor of Paediatrics & Head of Department of Paediatrics, Penang Medical College; Professor of Paediatrics & Head of Department of Paediatrics, AIMST University, Semeling, Bedong, Kedah.



8 IMU LEARNING PHILOSOPHY, LEARNING MODEL AND GRADUATE ATTRIBUTES

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The IMU Experiment

Victor Lim, Vishna Devi Nadarajah and Chia Chee Fen



8.1 Background

There is increasing concern that the present education systems do not adequately prepare students for life and work in the 21st century. A skills gap currently exists worldwide and both rich and poor countries alike must overhaul their educational and training systems. The same is also true in the case of health care professionals.

The health care system of the 21st century is radically different from that of the 20th century. To have a positive effect on health outcomes, those involved in health professional education must design new instructional and institutional strategies (Julio et al., 2010). Health care in the 20th century tended to focus on scientific, medical and technological means to conquer disease, reduce mortality and morbidity. As a result, it marginalised public health and primary care and affected equity and health for all.

Health care in the 21st century is characterised by rising expectations as a result of wealth and education. There will be a large elderly population who will use a disproportionate amount of resources. Advances in IT and connectivity allow everyone, both healthcare professionals and the public, to have ready access to information. Advances in genomics make it possible to better predict future disease and to employ novel diagnostic methods and therapies. There will be an increasing burden of disease related to lifestyle and there will be changing emphasis to extending wellness and improving health rather than treatment of disease.

The Institute of Medicine has identified the following major challenges for health professionals in the 21st century (Institute of Medicine, 2001). We need to better serve the needs of the chronically ill and make more effective use of information technology. We have to manage the knowledge base and ensure that we have the skills to

do so. We need to better coordinate care across patient conditions, services and settings over time. We need to work more effectively in teams and we need to improve performance by incorporating care processes and outcome measures into daily work.

Unfortunately health professional education, including medicine, has not kept pace with these challenges. Curricula remain fragmented, outdated and static. There is a mismatch of competencies to patient and population needs. Inter-professional education is not well developed and this results in poor teamwork due to a lack of understanding of one another's roles. There is persistent gender stratification of professional status. Medical and health professional education tends to have a narrow technical focus without broader contextual understanding. Experiential learning is through episodic encounters rather than continuous care and training is done predominantly in hospitals at the expense of primary care. There exists both quantitative and qualitative imbalances in the professional labour market and most importantly there is a lack of strong leadership to improve health-system performance.

There is therefore an urgent need to review current curricula and implement curricular changes. The curriculum should be driven by the needs of the community – the so called “demand side” curriculum. This is as opposed to traditional curriculum design where content is determined primarily by professors and lecturers and where the “loudest” professor often gets a disproportionate amount of curriculum time for his specialty. Modern curricula are outcome or competency-based where the outcomes or competencies are determined after discussion with the major stakeholders which will include patients, professional societies, potential employers and government. The curriculum should be dynamic and responsive to societal needs and changing local conditions.

8.2 IMU's Vision, Mission and Learning Philosophy

Our Vision is to be an innovative global centre of excellence in learning and research, supporting a community of scholars and professionals committed to serving society, promoting the development of students to reach their true potential in becoming competent, ethical, caring and inquiring citizens; and visionary leaders.

To meet the demands of 21st century health care systems the IMU had adopted a learning philosophy that is focussed on producing health care professionals who are prepared for the workplace and are fit-for-purpose. This learning philosophy which is consistent with our Vision and strives to ensure that the IMU graduates are adequately prepared for work. The graduate attributes that are essential for work readiness are identified and drives the learning-teaching processes. The learning philosophy is one that emphasises learning and where the primary role of faculty is not to teach but to arouse the curiosity of the student and ensure that the student has learnt. Our learning philosophy promotes of lifelong and inculcates in the student the culture of life-long learning. Learning should be student-centred and curricula are outcome and competency-based with the adoption of current best practices which ensure that the outcomes and competencies are achieved.

8.3 The IMU Learning Model

In 2008, the IMU crafted its Learning Model. This was the first time a document was produced that aligned the Vision of the university with its educational philosophy and educational outcomes. This Learning Model now serves as the basic template for all programmes in the university and takes into account the graduate attributes that are essential for work readiness.

The Learning Model was designed to enable the IMU to achieve its Vision as envisaged by its founders. The Learning Model also reinforces the University's declared pedagogical philosophy that emphasises learning. A key element of the Learning Model is the reiteration that programmes in the IMU will be outcome-based. For this purpose the eight outcome domains which were originally identified for the medical course are now extended to all other programmes. They are in the domains of:

1. Application of basic sciences in the practice of the profession
2. Psychomotor skills
3. Family and community issues in health care
4. Disease prevention and health promotion
5. Communication skills
6. Critical thinking, problem solving and research
7. Self-directed of lifelong learning with skills in information and resource management
8. Professionalism, ethics and personal development

All IMU programmes now adopt the above domains to develop their specific educational outcomes. These outcomes will drive all aspects of the curriculum in terms of content and organisation, delivery and educational settings, assessment and quality activities.

Curriculum mapping is a crucial element in the Learning Model. Each programme is expected to develop a detailed curriculum map specifying the outcomes at the point of exit as well as at every stage of the programme up to individual lesson outcomes. The lesson outcomes must be clearly stated and be related to one or more of the university's educational outcome domains. Students will be provided with a learning plan which is based on the educational outcomes. This will be a logical plan that will guide the student through a pre-determined path. This plan will guide student learning and provide them with the opportunity of

reflecting on their individual learning achievements upon completion of each stage of the programme.

The content of the programme should cover all the stated outcomes. It is often difficult to specify the breadth or depth of content but the student will be informed of the depth and breadth required to pass an assessment. Every encouragement and resource will be provided for students to go beyond what is required for passing. Students who surpass this “minimum” should be appropriately rewarded. Although informing students of the so-called “minimum” would make sense, it may sometimes be self-defeating as students may opt to strive only for the bare minimum in order to progress.

The organisation of the content should provide for both horizontal and vertical integration and provide opportunities for students to revisit concepts and principles (the spiral curriculum) as well as to acquire integration skills.

A variety of methods are used to deliver the content, selecting the most appropriate delivery tool to help the student achieve the lesson outcomes. Learning rather than teaching is emphasised and the delivery methods should be so designed to promote learning. There should also be strong and significant elements of independent learning, integration skills, critical thinking and problem solving. To ensure successful independent learning the necessary support and infrastructure like broad-band wireless Internet and Intranet access are provided for the students. There is a logical progression from directed self-learning to self-directed learning as the student progresses to the later semesters. There is a rigorous and continuous evaluation of teaching and learning strategies to ensure that they are in line with the best available evidence.

There is a need to enable and encourage coordination among the various programmes to promote inter-professional education. We have to strive to make all

our teaching environments exemplars for the future of health care delivery. The delivery methods place emphasis on the preparation of the student for the workplace and appropriate industry linkages have been developed to achieve this. Both curricular and extra-curricular activities contribute to helping students achieve the desired educational outcomes.

Our students need to learn how to improve health for populations and communities, as well as individual patients. Emphasis is placed on the training of skills needed to improve health, as well as the theory and computational skills necessary to comprehend the new biological sciences, as well as the social and behavioural sciences.

Our future health professionals should also be imbued with a strong sense of professionalism, ethics and social accountability during their early training. The importance of role modelling in the learning of ethics and professionalism is recognised and measures are put in place to ensure that the faculty are themselves professional and ethical.

The power of IT should be fully exploited for learning. The use of technology to make delivery of learning more efficient and effective is actively promoted but it is important to recognise that learning will drive the technology and not the other way round. All stated outcomes are assessed with an appropriate sampling across all outcomes. As in teaching and learning methodologies, a variety of methods are employed, selecting the most appropriate for each specific purpose. Students in the IMU experience a range of assessment methods in their programmes. There are both formative and summative exercises and remedial measures are put in place for those identified to need them. Criterion referencing is used and a passing mark that is appropriate is established through standard setting.

The Learning Model also emphasises the importance of a quality system to ensure that the outcomes are achieved at each stage of the programme. For all activities the programmes must ensure that the quality cycle is complete with appropriate remedial actions to close the loop. Regular feedback is obtained from all stakeholders including students, faculty, alumni, employers and the public. Finally we also need to develop, recognise and reward those who teach and conduct research on clinical education.

8.4 Work Readiness and Graduate Attributes

Work readiness has been defined as the extent to which graduates are perceived to possess the attitudes and attributes that make them prepared or ready for success in the work environment (Caballero & Walker, 2010). In the past academic achievement had been used as the main criterion for selection of graduates for a job. More recently employers are beginning to recognise the importance of a range of personal attributes outside the domain of academic prowess that are as important for success at work.

The Institute of Medicine's vision for the education of 21st century health professionals is that all health professionals should be educated to deliver patient-centred care as members of an interdisciplinary team, emphasising evidence-based practice, quality improvement approaches, and informatics (Greiner & Knebel, 2003).

Five core competencies were identified:

Provide patient-centred care - Identify, respect, and care about patients' differences, values, preferences, and expressed needs; relieve pain and suffering; coordinate continuous care; listen to, clearly inform, communicate with, and educate patients; share decision making and management; and continuously advocate disease prevention, wellness, and promotion of healthy lifestyles,

including a focus on population health.

Work in interdisciplinary teams - Cooperate, collaborate, communicate, and integrate care in teams to ensure that care is continuous and reliable.

Employ evidence-based practice - Integrate best research with clinical expertise and patient values for optimum care, and participate in learning and research activities to the extent feasible.

Apply quality improvement - Identify errors and hazards in care; understand and implement basic safety design principles, such as standardisation and simplification; continually understand and measure quality of care in terms of structure, process, and outcomes in relation to patient and community needs; and design and test interventions to change processes and systems of care, with the objective of improving quality.

Utilise informatics - Communicate, manage knowledge, mitigate error, and support decision making using information technology.

Other selected publications on health professional attributes are shown in Table 1.

Deakin University in Australia had developed a work readiness instrument that measures the work readiness of graduates based on four factors namely (a) personal characteristics (b) organisational acumen (c) work competence (d) social intelligence. (Caballero et al., 2011). Personal characteristics would include resilience, flexibility and the ability to cope with stress. Organisational acumen are factors like knowledge of workplace policies and procedures, maturity and personal development. Technical knowledge and skills are included under work competencies while social intelligence encompasses communication skills, teamwork and managing interpersonal conflict.

8.5 IMU Graduate Attributes

It is essential to clearly define the desirable attributes of the IMU graduates that are required for work preparedness in order to form learning and teaching strategies. The university's vision identifies some of these desired traits namely, a commitment to serve society, being competent in their work, being a caring individual, having an inquiring nature and visionary leadership.

The current IMU outcome domains stress the importance of application of knowledge, having good psychomotor skills, being aware of family and community issues, disease prevention and health promotion, communication skills, critical thinking, problem-solving and research, lifelong learning, digital literacy and professionalism and ethics.

The university's core values emphasises certain basic traits that should be inculcated into our graduates. Trustworthiness encompasses reliability, integrity and commitment. Responsiveness means being responsive to the needs of people, responsive to timeliness and responsive to change. Unity embraces teamwork, fellowship and collaboration while Service requires one to always provide the best to all stakeholders, clients and the community. Tenacity envisions perseverance, persistence and cohesiveness.

A Senior Management Retreat was held in January 2015 to identify the IMU graduate's attributes. Taking cognisance of our vision, existing learning outcome domains, the university's core values as well as the current needs of the health industry; each School presented its list of graduate attributes. Even though there were some variations in detail, there were more commonalities than differences.

There was general consensus for the following attributes:

Work competence attributes

- Sound technical knowledge and good clinical skills
- Patient centredness
- Digital literacy
- Industrial experience
- Entrepreneurship

Social Intelligence

- Communications skills
- Teamwork
- Conflict management and resolution

Personal characteristics

- Trustworthiness and integrity
- Leadership
- Professionalism and ethics
- Responsibility and accountability
- Critical thinking and problem solving
- Innovation and creativity
- Resilience

Organisational acumen

- Professional development and lifelong learning

In order to nurture these attributes in our graduates, the IMU needs to provide an environment that is conducive to the development of these traits and values. This is discussed in Chapter 3.

Table 8.1 Graduate Attributes in Health Professionals

Discipline	Medicine	Nursing	Nursing/Medicine	College Graduates
Journal Reference	<p>Med Teach. 2012;34(2):123-35.</p> <p>Preparedness for practice: the perceptions of medical graduates and clinical teams.</p> <p>Morrow G1, Johnson N, Burford B, Rothwell C, Spencer J, Peile E, Davies C, Allen M, Baldauf B, Morrison J, Illing J.</p>	<p>J Adv Nurs. 2001 Dec;36(5):626-34.</p> <p>Undergraduate student nurses' expectations and their self-reported preparedness for the graduate year role.</p> <p>Heslop L1, McIntyre M, Ives G.</p>	<p>Nurse Educ Today. 2013 Feb;33(2):116-22</p> <p>Work readiness of graduate health professionals.</p> <p>Walker A1, Yong M, Pang L, Fullarton C, Costa B, Dunning AM.</p>	<p>Are They Really Ready To Work? Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce</p> <p>http://files.eric.ed.gov/fulltext/ED519465.pdf</p>
Measurement	<p>A five-point Likert response scale, ranging from 1 for 'not at all prepared' to 5 for 'fully prepared'.</p>	<p>Binary response (Yes or No) for the following categories: Very well prepared, Well Prepared, Satisfactory, Unprepared, Very Unprepared</p>	<p>Participants discussed a total of 92 critical incidents; 52 related to helping and 40 to hindering work readiness factors that impacted graduates' transition and integration experiences. A follow-up thematic analysis identified four critical work readiness factors: social intelligence, organisational acumen, work competence and personal characteristics</p> <p>Note to IMU: we may want to explore the themes in a questionnaire format</p>	<p>Employer respondents were asked to indicate which basic knowledge and applied skill areas they rate as "not important," "important" or "very important" for new entrants' successful job performance. The findings indicate that, for the most part, what employer respondents rate as "very important" for entry-level jobs is similar across the three educational levels. However, their responses indicate that, in general, the importance of the basic knowledge and applied skill requirements for entry-level jobs increases as the educational level of those recent hires increased.</p>

Discipline	Medicine	Nursing	Nursing/Medicine	College Graduates
Domains for graduate work preparedness	<ol style="list-style-type: none">1. Complex communication2. Practical procedures3. Self-direction4. Professionalism5. Multiprofessional working6. Paperwork7. Examination skills8. Clinical judgement9. Professional development10. Leadership	<ol style="list-style-type: none">1. Knowledge2. Clinical experience3. Skill level4. Time management5. Decision making6. Caring for six to eight patients7. Caring for patients with complex health problems8. Communicating with doctors9. Communicating with patients10. Communicating with other professionals11. Communicating with relatives or significant others	<ol style="list-style-type: none">1. Social intelligence (Ability to communicate, team work, manage interpersonal conflict, seek support)2. Organisational acumen (Knowledge of Ward, Hospital Policy and Procedures, Maturity and Professional Development)3. Work competence (Clinical Skills Technical Knowledge, Experience, Confidence, Responsibility)4. Personal characteristics (Resilience, Flexibility, Stress Management)	<p>Employers rankings of important attributes</p> <ol style="list-style-type: none">1. Oral Communications*2. Teamwork/Collaboration*3. Professionalism/Work Ethic*4. Written Communications*5. Critical Thinking/Problem Solving*6. Problem Solving*7. Writing in English8. English Language9. Reading Comprehension10. Ethics/Social Responsibility*11. Leadership*12. Information Technology Application*13. Creativity/Innovation*14. Lifelong Learning/Self Direction*
Participants of Study	New graduates Colleagues from first work posting (doctors, nurses, pharmacists)	3 rd year final graduating nursing students	Medical, Nursing Graduates, Organisational Representatives	Employers
Setting	UK	Australia	Australia	USA

The IMU needs to improve its ability to identify health sector workforce demographics and needs (both nationally and internationally) in order to inform university as well as learning-teaching strategies. In collaboration with industry and governmental agencies, the Schools and Programme leads should develop a streamlined process for workforce data collection, transmission, storage, and reports. The IMU also needs to strengthen its ability to use workforce data including employer feedback on work readiness of the IMU graduates to strategically inform educational initiatives.

8.6 Implementation of the Learning Philosophy and Learning Model

The IMU learning model is a statement of our learning philosophies with descriptions of teaching learning concepts to be applied and practised by all schools in the university. The word 'learning' rather than teaching is emphasised in the learning model, with expectations that the IMU community have the correct understanding of concepts related to Outcome-based education, Reflective Learning, Self-directed learning, Inter Professional Learning, Workplace-based Learning, Assessment for learning and Technology to enhance learning.

In relation to introducing teaching and learning philosophies and ensuring transfer of skills to both students and teachers, the 4 phase process of initiation, implementation, ramping up and final integration is suggested to be norm. Furthermore this process can take years to reach final integration (Hendricson et al., 2007). Figure 1, shows the four phase process; as depicted, the initiation phase forms the inner circle of teachers who are usually small in numbers, intellectually and personally motivated to plan and implement the innovation/philosophy related to teaching and learning. These groups of staff would probably have attended specific Faculty Development Activities (FDAs) (either externally or internally) to gain skills related to the innovation/philosophy.

The next stage of implementation usually involves the larger outer circle, who may usually be in the dark of the innovation/philosophy. The outer circle usually would need training and convincing on why an innovation/philosophy is needed, i.e. why is there a need to change. FDAs related to the innovation/philosophy needs to be shared with and given to the outer circle to ensure buy in, as resistance may cause the innovation/philosophy to fail at this stage. The next ramp-up phase, will eventually involve a larger group including students and support staff. Training or briefing on the need for change and skills /resources needed will be given here (i.e. a larger circle). However the ramp-up phase also differs as this is the stage to identify problems and fine tune the innovation/ philosophy. Quality indicators for the effectiveness of the innovation/philosophy may also be introduced here. Importantly the FDAs are essential in this phase too as feedback from a larger circle can help improve the innovation/philosophy. The outermost circle is the integration stage, whereby the innovation/philosophy is already part of routine and no longer considered new.

What roles do IMU Students, Faculty, Management, Schools and support centres have in ensuring that the learning model is integrated, practised and alive in the IMU?

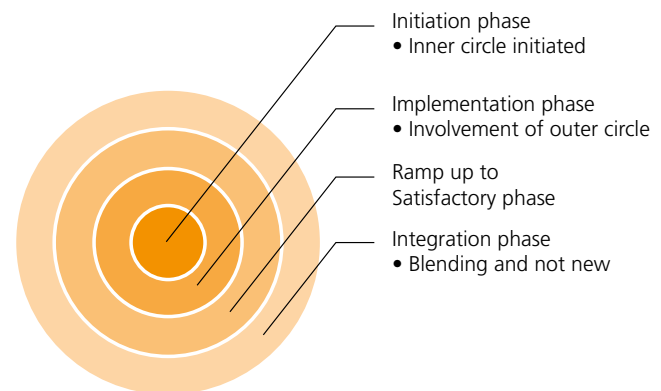


Figure 8.1 Phases while implementing a new teaching learning philosophy (Hendricson et al., 2007).

8.6.1 Role of Students

We begin with students as they are inevitably at the heart of the university. At the IMU, our students are studying subjects related to healthcare and will undoubtedly make an impact in healthcare delivery in Malaysia. As healthcare practitioners continuing professional education is necessary hence lifelong learning skills are akin to survival skills for our graduates. At the IMU, our teaching learning methods help inculcate lifelong learning skills through self-directed learning methods. Self-directed learning is a process in which individuals take the initiative in diagnosing their learning needs, designing learning experiences, locating resources and evaluating their learning. Literature has shown that this process is beneficial to students as retention of knowledge is better, students are more confident, they have an awareness of their strengths and weakness and are resourceful (Murad *et al.*, 2010). Teaching learning methods that promote self-directed learning at the IMU are problem-based learning, task-based learning, research projects, student-led assignments and presentations (Dolmans & Schmidt, 2006). While the above mentioned teaching learning methods are usually small group learning sessions, our large group teaching learning methods also have elements of self-directed learning. For example the e-learning portal caters to a large number of students however, the instructional design of the e-learning materials promotes assessment for learning with opportunities for students to test themselves and receive feedback on their performance (McKimm *et al.*, 2003). Similarly lectures in the IMU are not just information giving sessions, through the concept of flipped classrooms, students are required to participate in pre-lecture activities such as reviewing learning materials so that during the lecture teachers are able to engage students learning activities that assess the students' understanding of the learning materials. The success of these activities requires much initiative from the students, hence the more motivated the students

the better the learning experience. Students are also encouraged to develop and continuously reflect on their performance by maintaining learning portfolios (Driessen *et al.*, 2007). At the IMU, learning activities are usually conducted in the context of the respective students' future healthcare settings, the aim here is for the students to experience settings that are authentic and reflective of their future profession (experiential learning) (Yardley *et al.*, 2012). To facilitate experiential learning, the IMU works closely with the Ministry of Health Malaysia to ensure students have the relevant clinical exposure in various healthcare settings.

8.6.2 Role of Faculty

While students are at the heart of the university learning experience, our faculty members act as facilitators for the students' learning experience. At the IMU every faculty member is constantly reminded that their role is to ensure that the student has learnt, with emphasis on learning rather than teaching. Faculty development programmes (FDP) are crucial in ensuring that the IMU teachers are in sync with the learning model of the University. The planning, resources and implementation of FDP at the IMU are targeted to a multi-professional and multi-national faculty representing the different academic programmes. The FDP at the IMU consists of training activities that aim to develop, improve and update faculty knowledge, skills and attitude in relation to their roles in the institution. This definition of FDP is similar to published literature (Steinert & Mann, 2006; Steinert *et al.*, 2012). Through the FDP, the IMU faculty receive training relating to teaching and learning by the IMU Centre for Education (ICE) and the Human Resources Department. These courses are conducted using significant financial resources, skilled human resources (either internal or external) in organising, conducting and evaluating the training. Hence it is reasonable for the IMU to expect improved teaching,

research and administrative competencies in a faculty that has attended activities in a FDP. However, the success of faculty development programmes is attributed to several factors, this includes (i) the instructional design of the programme and the adult learning processes it supports, (ii) consideration of learner attributes and (iii) resources for a sustainable programme (Hendricson *et al.*, 2007; Loucks-Horsley *et al.*, 2010; Steinert *et al.*, 2012).

When considering the instructional design of a faculty development activity, the following processes has been attributed to enhancing effectiveness; the use of experiential learning (opportunities to show how and do), giving timely and relevant feedback on performance, a chance to demonstrate or use skills learnt soon after training, inclusion of activities that have peer mentoring and collegial interaction, use of multi-professional perspectives and diverse experiences and opportunities for continuous improvement after training (for example, post training feedback) (Hendricson *et al.*, 2007; Steinert & Mann, 2006). These abovementioned factors are related to strategies on enhancing the transfer of training (ability to generalise and maintain trained skills on the job), whereby poor planning or lack of activities during, pre- and post-training can be detrimental to a FDP (Saks & Belcourt, 2006).

Teacher learning attributes are equally important considerations in developing FDP. Sessa and London suggested that adults learn by (i) Adaptation, (ii) Generation and (iii) Transformation (Sessa & London, 2006). Adaptation means learning by adapting to changes in the environment, hence this learning can be intentional or unintentional. Generation means learning by creating new knowledge, opportunities or events, this learning is related to the cognitive ability of the learner, for example being able to reflect and identify areas of improvement within oneself. Transformation is a follow on of both adaptation and

generation but goes a few steps further as transformation means being able to create, apply and bring change through what has been learnt. Hence what are the learner (in this context a faculty member) attributes that can affect the positive effects of adaptation, generation and transformation? In a study exploring a teacher's will to learn, Van Eekelen *et al.*, (2006), showed that there are certain behaviours or personality characteristics that suggests a will to learn. These include for example, asking questions after sessions, openness to diverse opinions, being able to link outcomes both positive and negative to internal causes, being proactive and showing interest to discover learning process (Van Eekelen *et al.*, 2006). This study also notes that there are 3 manifestations of the will to learn, including interestingly 'not seeing why there is a need to learn', faculty with this attitude usually hold on to old habits, are not self-reflective or self-critical, and is unable to apply or assess a learning experience (Van Eekelen *et al.*, 2006). The other 2 manifestations include 'wonder how to learn', meaning they clearly want to learn but don't know how and 'eager to learn' meaning they are faculty who are both willing and able to learn. At the IMU, continuous but different engagement strategies with these 3 groups of teachers are needed. For example ICE can identify and engage those who are 'eager to learn' when developing a specific FDP, this can help increase the buy in of the outer circle of implementation shown in Figure 1. The other groups should also be engaged by ICE, time-to-time to identify barriers and strategies for their involvement in learning.

8.6.3 Resources

In order to ensure a sustainable FDP programme and achieve full integration of the learning model in the IMU community, there needs to be resources available for the Schools and the academic Support centres (for example, ICE, Academic Services, Student Services). Resources

can be considered as either financial, learning spaces, information technology, human resource (faculty, training experts and administrative support) or collaborations (for example, sharing of best practices between schools or external clinical teaching sites). Both the Schools and academic support centres are continuously engaging with one another to ensure the best use of resources when implementing teaching learning activities that embody the learning model.

8.7 Monitoring Progress

Monitoring is an essential element of the University's quality assurance and quality enhancement processes. Monitoring allows Schools and the University to assure themselves that the courses and programmes we deliver meet the expectations of staff and students and to continually look for opportunities to develop and enhance provision. The follow-up improvements must be communicated to all the stakeholders to close the feedback loop and to ensure that actions and outcomes are reported to colleagues and students. For remedial measures to be effective and continuous improvements to be put in place, all interventions need to be planned using good quality data.

8.7.1 Sources of Data

The main source of information is obtained by the IMU Centre for Education (ICE). ICE conducts evaluation of courses, faculty and the learning environment. This is undertaken together with the Associate Deans of each School and the programme coordinators to design relevant questionnaires suitable for each programme and to ensure the appropriate timing for conducting the surveys. Students are the respondents to these questionnaires. Basic analysis of the data is performed by ICE and the results are fed back to the various schools and programmes. Other sources of information for quality assurance include curriculum

reviews, external examiners, external evaluators (e.g. MQA, PEAC, Academic Council) and appointed advisors. Feedback is also obtained from employers, faculty and partner universities.

8.7.2 Acting on the Data

The IMU has established an academic system to address all gaps and deficiencies identified through analysis of the data and the recommendations of various individuals or committees tasked with reviewing the academic quality of programmes. The results and recommendations are initially discussed at the respective Curriculum and Assessment Committees. Gaps and lacunae are identified and interventions proposed to remedy the deficiencies. The proposed interventions are subsequently tabled at Faculty Board for adoption. Major changes to curricula are brought to the attention of Senate for further discussion and endorsement.

8.7.3 Closing the Loop

To close the loop, the effectiveness of these interventions will be gauged through subsequent re-evaluations. Faculty evaluation is similarly analysed and data are provided to the staff member concerned and their respective deans. The ability to reflect on one's performance as a teacher and to establish a personal development plan in teaching scholarship is expected of all IMU faculty.

8.7.4 Ensuring the Closing of Loops and the Effectiveness of Interventions

To ensure that loops are closed and interventions are successful, an annual monitoring process at university level should be established. The aim of this process is to highlight and record interventions that have been shown to be effective over the previous year and to identify those

in which the need for further improvement is essential in order to further enhance the student experience.

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THE 8 PRINCIPLES OF LEARNING IN THE IMU

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9.1 Introduction

In order to nurture the desired attributes in our graduates, the IMU needs to provide an environment that is conducive to the development of these traits and values. The 8 Principles of Learning in the IMU are adapted from a document developed by Richard James and Gabrielle Baldwin for the University of Melbourne in 2002 and subsequently revised in 2007 (University of Melbourne, 2007).

9.2 An Environment of Scholarship and Intellectual Stimulation

Scholarship can be defined as academic study or achievement of learning at a high level. Scholarship embodies activities that result in discovery, integration, application and teaching within an environment that accepts nothing less than the highest standards of professionalism and ethics.

The challenge would be to create an environment that would entice the whole IMU community to desire for, and work passionately towards this. We are confident that this can be done as that foundation has been carefully laid for more than two decades. The IMU will need to identify and empower leaders in the scholarly activities of discovery, integration, application and teaching. These leaders in turn would interact within and between these areas in the spirit and substance of collegiality that is so vital for intellectual stimulation and advancement. This interaction must also involve the community at large, the ultimate aim being for the IMU to be a credible source of knowledge, advice, consultancy, advocacy and above all, relevance.

Scholarly activity is integral to effective student teaching / learning activities and is a component of all faculty work. The IMU will facilitate faculty engagement in scholarly activity through provision of technical and logistic expertise,

provision of resources and a safe environment to carry out research, and collaborate with external agencies. The University will promote innovation and avoid factors that may hinder exercising of professional responsibilities by ensuring that such a model of management does not contribute to blunting of scholarly activity. It is the responsibility of the University to enable faculty engagement in scholarly activity.

The lack of adequate resources and support (e.g. faculty expertise, research facilities, inability to support effective and efficient research management and faculty time), as well as institutional ignorance of the central role of scholarly activity, blocks faculty from fully exercising their professional responsibilities and makes it difficult to achieve teaching excellence.

The IMU strives to ensure that all the academic programmes offered are of the highest academic standard which can be benchmarked internationally. In the outcome domains generic to all courses the emphasis is on application of knowledge and not merely acquisition of knowledge. However there is little being done to link the research findings of faculty in the IMU to the teaching and learning of the students. All programmes also offer a research component that helps to engender curiosity and to inculcate scientific thinking and decision making based on evidence.

Faculty need to engage with students and to ask questions or set assignments that challenges the student to think out of the box and break all barriers of preconceived notions; to be able to make connections which were not previously apparent; to have the “aha” moment when insight is gained.

9.3 The Emphasis on Enquiry, Research, Knowledge Transfer and Evidence-based Practice

Research involves answering a question in a scientific manner based on evidence. It involves forming hypotheses and testing them. This emphasis on research in the IMU should be beyond the formal application for research grants and undertaking research projects. Research or a research approach should be something on a routine basis in learning and in solving problems in the work place.

Decisions should be made based on evidence whether it is a clinical decision; a decision to introduce a new mode of delivery of learning or a decision to start a new programme. There should be a research culture in the IMU and it involves everybody not just students and faculty.

A culture of inquiry needs to be enhanced in all activities in the IMU if it is to be a learning organisation. In order to foster deep and transparent critical inquiry, we need to build a conducive environment (Reid A, 2004) where:

- a. discussion and debate is encouraged, involving the widest range of voices possible
- b. certainty and dogmatism is rejected
- c. there is a recognition that there is no one right way to approach complex educational issues
- d. interactions are based on trust, and where people feel free to talk about difficulties and concerns in their teaching in a safe and non-judgemental environment.
- e. avenues are provided for all participants to have a voice, and not allow the strongest voices to dominate
- f. inquiry is modelled at all layers of the system
- g. everyone in the organisation demonstrates behaviour that is respectful, tolerant and civil

The following values and/or characteristics need to be inculcated in a culture of inquiry:

- a. curiosity
- b. a willingness to linger with questions or perseverance
- c. a commitment to constructing knowledge with others through dialogue, disagreement and challenge, and attentive observation.

A culture of inquiry should be internalised into every faculty, student and corporate staff member of the organisation. This can be achieved through effective and innovative teaching and learning activities, and active discussion in seminars and workshops.

Teachers often benefit from discourses with students, especially postgraduate students in the formal and informal settings. In their quest for knowledge, such students often read topics on specialised areas beyond that of their teachers.

Faculty and corporate staff must not function in isolation but must deliberate to stimulate, challenge and generate ideas as befits a community of scholars.

9.4 A Dynamic, Exciting Social Context, with a Clear Focus on Service at the Interface with the Community

Learning cannot be in isolation. All learning must be socially relevant with an outcome that would eventually be of benefit to society.

UNESCO identifies 4 pillars of education (International Commission on Education for the 21st Century, 1996) namely:

- Learning to know
- Learning to do
- Learning to be
- Learning to live together

All 4 pillars must be addressed in the IMU. Learning cannot be confined to the classroom and only from what the faculty is capable of supplying. There must be opportunities for students to build on knowledge and experience that they bring from their families and communities. Learning should in an environment that is authentic and contextual. If our graduates are to be leaders and change agents in the community their learning must emphasise their connection to society and the environment.

The IMU has many opportunities to make learning dynamic and exciting in a socially relevant context as recent literature suggests that biosocial medicine/health may be an effective and contextual way to encourage learning through enquiry and research by participating in community service projects. This is with the aim of graduating health care practitioners that are able to recognise and respond to the social factors that are at the root of patients' risk for disease, response to the disease and experience with disease.



Biosocial medicine or healthcare requires reflective knowledge acquisition that merges training in the “bio” (which includes basic science, epidemiology, and clinical knowledge) with training in the “social” (which includes economics, culture, history, politics, and social structure). Teaching learning activities related to biosocial medicine

involve working to improve health through building community partnerships. At the IMU some successful examples are projects in IMU Cares where opportunities are present for utilising narrative medicine in patient care, participating in social movements and be agents and advocates of change, practising community-based participatory action research, engaging in critical pedagogy and collaborating in other activities to cultivate and respond to an understanding of the social determinants of health.

9.5 An International, Culturally Diverse, Social and Learning Environment That will Foster a Forward Looking and Open Outlook

Learning to be and learning to live together are the UNESCO's 3rd and 4th pillars of education. An education in the IMU cannot merely be the acquisition of knowledge and skills. In order that our graduates fulfil their roles as responsible citizens who serve society through leadership and as change agents, it is important that our students' journey is as much a journey in character building as it is in getting prepared for the workplace.

It is our duty to inculcate the necessary values among our students, to strengthen their self-esteem, to learn tolerance and respect for others and to learn to be responsible citizens in the multi-ethnic and multi-religious milieu that is Malaysia. These values should also include the values which we want them to have as future health professionals taking into account the expectations of patients and the health needs of society.

The first task would be to establish the core values that we want to inculcate in our students, be very clear what they mean and make them explicit to all students and staff.

The next would be to establish an environment that supports and encourages these values. The roles and

behaviours of staff and students should be clearly defined. Role modelling is of utmost importance. If we want our students to respect others faculty need to treat students with respect. Similarly if we want respect and courtesy to be a way of life in the IMU, heads need to treat their subordinates accordingly. This is part and parcel of professional behaviour.

These values would have to be incorporated into all policies of the IMU as well as the academic programmes; not so much in the content but the manner in which all learning and assessment activities are delivered or conducted.

It is important for our staff and students to recognise and appreciate the roles played by their colleagues in the other health professions. This is because health care is now delivered by teams and not by individuals. Inter-professional learning should be integral across all programmes.

Faculty together with the Student Services Department play an important role in facilitating and guiding extracurricular activities; to promote inclusiveness and discourage exclusivity. Activities should be organised to promote learning and understanding of the different cultures and religions.

9.6 A Clear Emphasis and Support for Individual Development: Individualisation, Differentiation and Personalisation

Ron Harden established the FAIR principle of excellent teaching (Harden & Laidlaw, 2013) – Feedback, Activity, Individualisation and Relevance. To be a good teacher one must practise the FAIR principle.

Individualisation is also sometimes used interchangeably with Personalisation and Differentiation but there are some important differences.

Individualisation refers to instruction that is paced to the learning needs of different learners. Learning goals are the same for all students, but students can progress through the material at different speeds according to their learning capabilities and needs. For example, students might take longer to progress through a given topic, skip topics that cover information they already know, or repeat topics they need more help on. In the IMU the system of referred and repeat examinations allows students to take a longer than prescribed time to achieve their learning outcomes. Currently there are no mechanisms in the IMU to allow students to finish their course earlier than the prescribed time. The Ministry of Education regulations also do not allow for this as minimum course durations are defined and strictly monitored.

Differentiation refers to instruction that is tailored to the learning preferences of different learners. All students do not learn in the same manner. Learning goals are the same for all students, but the method or approach of instruction varies according to the preferences of each student or what research has found works best for students like them. In the IMU differentiation is not practised to any significant extent although students who do not like to learn from face-to-face activities (e.g. lectures, case-based learning) are not required to attend them as the course materials are also available on the e-portal and interactions can be conducted on-line (discussion fora, Wiz-IQ, mobile Apps, Wikis, etc).

Personalisation refers to instruction that is paced to learning needs, tailored to learning preferences, and tailored to the specific interests of different learners. In an environment that is fully personalised, the learning objectives and content as well as the method and pace may all vary (so personalisation encompasses differentiation and individualisation). Again personalisation is not practised in IMU to any significant degree except in electives and selectives where the student can pursue a course of study

of his or her interest. In the medical programme students interested in research can opt for an intercalated Bachelor of Medical Science (BMed Sci) programme but thus far very few students have chosen this pathway solely due to an interest in research.

Personalisation is perhaps more appropriate in the IMU postgraduate taught courses where the candidate can select from a menu of courses and there is flexibility in the time allowed to complete the programme.

There are strategies that can help students develop further or specifically based on their areas of interest by giving different pathways midway through or after the academic programme. For example there is the Student as a Teacher pathway (Song et al., 2014; Erlich & Shaughnessy, 2014) as illustrated by our peer teaching policy in medicine and dentistry.

Similarly there are programmes with student options to do research (e.g. BMed Sci in IMU) or community work in a structured manner, sometimes resulting in additional qualifications or publications. The IMU can consider whether these options are available within each programme, and if it can be expanded to include entrepreneurship, business management and the humanities. Currently some programmes have these as modules, but not as a specific pathway to excel in midway or after the course.

Learning and lesson plans are already in place with detailed study guides available to all students, and students are able to plan their learning experience based on this.

For students struggling to balance or create their learning experience, the support structure for them in the IMU is currently lacking.

9.7 Academic Expectations and Standards Clearly Set

Students must know the rules of assessments and what it takes to pass. Assessments must be transparent, just and fair and must also be seen to be so. There are detailed exam regulations in the student handbooks and briefings are also conducted by semester coordinators or deans. However we need to ensure that the student knows and understands these rules and regulations through repeated reminders and briefings. The IMU adopts outcome-based and competency-based curricula; thus the expected outcomes and competencies must be clearly defined and explained to students.

Blueprinting of assessment is essential to ensure that all major outcome domains are adequately assessed.

The level of difficulty of the assessment must be appropriate to the phase in the programme and standard setting using an acceptable method to ensure that a fair passing mark is set.

The IMU practises criterion referencing and faculty need to be conscious of this and not apply norm referencing during their evaluation of students' performance. The criteria for passing should be defined and any student who meets or exceeds this criteria will be deemed to have passed. If every student in the cohort meets the criteria, the entire cohort passes.

Similarly the standards for professional and ethical behaviour must also be explicit and steps are taken to ensure that the students understand them. The manner by which students will be assessed must also be clearly defined and made known to the students. The sanctions for breaching these codes of behaviour must also be clearly spelt out and this will include being referred to the Student's Fitness to Practice Panel.

Similar standards of behaviour for staff must be established and made explicit, and as in the case of students, the sanctions for breaching the code of behaviour clearly defined.



9.8 A Clear Emphasis on Quality, Promoting Innovations, Experimentations, Evaluations, Assessment and Feedback

In the IMU quality assurance processes in education have been taken very seriously since its establishment. This is not unexpected since we started with a credit transfer programme in medicine and the partner medical schools have to be reassured of the quality of transferring students. Over the years the quality system has expanded, more data is collected and analysed routinely, more quality targets are set and more accreditation bodies and teams established, both internal and external; local and international.

There are however several gaps in the current quality assurance system:

- i) The exercises are primarily focussed on inputs and processes and there has been very few attempts to look at outcome, in particular outcomes in the longer term and behavioural outcomes.
- ii) Our own assessments are also quality assurance processes which tell us if the students have achieved their learning outcomes and while we have put in some measures to ensure the process of assessment is valid and reliable, we have not used the results of the assessments in any major way. The results of assessment have many uses for quality improvement:
 - a. If feedback is adequate, it informs the learner and fosters learning.
 - b. It drives curricular changes and assures that curricular goals are met.
 - c. For the institution it drives self-assessment, faculty development and provides data for education research.

To close this gap; the IMU requires software to make detailed analyses of examination results. Manual analysis is too tedious, laborious and slow. With the appropriate software, students can receive an individualised report on his or her performance; often immediately after the examination. Different reports can be generated for specific use by the programme, the school and the institution.

Closing the loop is still a challenge and in general the quality data has not been instrumental in driving change and innovations.

We need to change the focus and mind-set of faculty to adopt a Total Quality Management approach rather than merely meeting targets that have been predetermined. This approach in making small incremental improvements does not drive innovations. It would be more appropriate for programmes to aim for large significant and impactful improvements rather than improvements in small steps.

Feedback is information given to the learner aimed at modifying or changing behaviour for more effective learning. Feedback can

1. Clarify learning goals
2. Reinforce good performance and motivate the learner
3. Help learners recognise their deficiencies and inform future learning

It has been shown that effective feedback leads to higher academic performance. (Hattie & Timperley, 2007) However the process of giving effective feedback and using received feedback for self-improvement is fraught with tensions. Karen Mann recognises 3 sources of tension in the feedback process (Mann *et al.*, 2011):

1. Tensions within self – desiring feedback but fearing disconfirming information; recognise the need for feedback but struggle to use it because of incongruence with self-appraisal
2. Tensions between people – wanting to ask others for feedback but fear of showing incompetence and deficiencies; wanting feedback but do not trust the feedback; worry about damaging the relationship with honest feedback
3. Tensions in the learning environment - incongruence between the stated curriculum and the curriculum in action; perception that feedback is a meaningless game done to please others

To resolve these tensions Mann has proposed that:

1. the individual needs to recognise the emotional aspect of receiving feedback and the inherent difficulty in reconciling self-appraisal and contradictory feedback
2. teacher-learner and peer-peer relationships need to be respectful and supportive; feedback is informed and specific to the learner's needs, feedback should seek to enable learning

3. a climate of mutual and collective learning is supported; appropriate modelling of giving and receiving feedback; benefits of self-assessment made explicit to teachers and learners

For feedback to be effective in the IMU, these tensions need to be recognised and the necessary training is given to both students and teachers. We also need to create an environment that embodies the values of professionalism and is supportive of learning.

The other aspect of quality is that it should be a competency for all health care professionals. All students need to acquire a basic understanding in quality and to have the opportunity to participate actively in a quality assurance project that is relevant to their future practice.



9.9 A Socially Relevant Curriculum

Social relevance in health professions education may be defined as the obligation to direct their education, research and service activities towards addressing the priority health concerns of the community, region, and/or nation they have a mandate to serve. The priority health concerns are to be identified jointly by governments, health care organisations, health professionals and the public.



The process of curriculum planning is also referred to as demand-side planning where the curriculum is driven by the needs of the community based on discussion and feedback from all relevant stakeholders. This is opposed to the supply-side curriculum planning where the school decides on the curriculum based on the opinions of faculty and the resources available in the school.

An association with excellence should be reserved for educational institutions which can verify that their actions make a difference to people's well-being. Health professions graduates should possess all of the competencies desirable to improve the health of individuals and society, and must also use them in their professional practice.

The World Health Organisation has enunciated 4 principles that should underpin the type of health care that people have a right to expect, from both an individual and a collective standpoint (Boelen & Woollard, 2009): quality, equity, relevance and effectiveness. Therefore, social, economic, cultural and environmental determinants of health must guide the strategic development of an educational institution, including its curriculum.

To measure social relevance in health professions education the following questions need to be answered:

1. Is the curriculum relevant to the health concerns of the community?
2. Does the curriculum emphasise on quality of care in relation to safety and effectiveness, and evidence-based practice?
3. Does the curriculum emphasise health needs beyond the normative in recognition of perceived and social needs to ensure that health outcomes are equitably distributed?

The operational implications for the IMU to ensure that all our curricula are and remain socially relevant are:

1. Curriculum review and audit should be underpinned by the 4 principles of social relevance.
2. Regular curriculum reviews to be conducted as the health needs of the community changes with time.
3. Relevant stakeholders should be part of the curriculum review and audit processes.
4. Extensive consultation to engage the community should be practised.
5. Assessment of the curriculum impact on the community should be carried out.



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IMU E-LEARNING FOR THE FUTURE

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The IMU Experiment



10.1 Introduction

Over the last decade, the world of practically every field from business, banking to the printing press are increasingly being transformed through the acceleration of new disruptive technologies, globalisation, fierce competition and innovation.

Higher education is no exception (Beaudoin, 1998; Allen & Seaman, 2007), and for those institutions who do not innovate, take advantage of new disruptive technologies, rethink their learning models and spaces, and adapt to the human capital needs of these fast evolving changes taking place in the business world and society, will increasingly face irrelevance and potentially bankruptcy in the coming years. To deal with the massive changes and disruptive innovations taking place in the world of education, the IMU must strive to continuously innovate and take the lead in both blended and online learning in the coming years to be relevant and spread its wings to enrol more students from around the world.

This means that we need to rethink how we are currently using e-learning and technology for learning and teaching, and embrace quality learning trends such as personalised learning, mobile learning, collaborative learning, e-portfolio assessment, learning analytics, mastery learning, online assessment (formative and summative with constructive feedback), simulation, gamification, MOOCs/OERs and virtual hospital to amplify and transform the students' learning experiences.

The IMU's new and evolving 'TEST-Learning' framework will continuously remind us to use technology to redefine and transform the way we facilitate learning and teaching. Today, enhancing and transforming students' learning experiences is no longer an option. It is the only way to survive and prosper in the coming years and decades.

10.2 Future e-Learning Trends

What will e-Learning (or learning) look like at the IMU in 2020?

Which disruptive technologies and learning methods should the IMU focus on to transform and get a leading edge over other learning institutions by 2020?

Based on the disruptive changes in educational technologies over the last decade (e.g. Social Media, Cloud Computing and Mobile Learning), it is not so straightforward to predict exactly the right direction or tools to select for the future. However, there are certain patterns and themes that we can derive and synthesise from the existing trends and future predictions to guide us (Johnson et al., 2013; Schubarth, 2013).

Firstly, we need to keep in mind that by 2020, most if not all learning we do will involve using some form of technology, and that the letter 'e' will gradually disappear from the word 'e-LEARNING'.

Let's look briefly at seven key e-learning trends that will impact how learning might look like in 2020:

• Openness

More and more quality Open Content, Open Educational Resources (OER) and Massive Open Online Courses (MOOCs) from top universities and companies around the world will be made available freely for anyone to reuse/remix (using Creative Commons License) or learn from (including copyrighted materials which will not allow reuse/remix) (Rosen, 2012). As such the ability to curate, validate (for copyright or reuse clearance when needed), remix (learning content) and then infuse such content into the course design (and curriculum) will increasingly become an important skill to master.

Universities are already exploring how to use MOOCs as part of a blended or flipped designed course, whereby students are required to study content from related MOOC course(s), and then use the F2F sessions (tutorials) with the on-campus lecturer/facilitator for more enriched learning activities, which could include discussions, group work, lab exercises, etc. (Bruffet al., 2013). In other words, the MOOC replaces the lectures and most of the course-related reading materials (Think of it as a real-time interactive social e-book). As such, lecturers can focus more of their time on designing and enriching the student learning experiences, rather than being bogged down in creating e-learning content (which could be very costly, too).

Why reinvent the wheel (of content)? As everyone will have access to top-notch learning content (mostly for free), smart universities and academics will strive to acquire a competitive edge by focussing more time on designing quality learning environments and experiences, rather than developing content that already exists. Mastering the ability to find, reuse or remix content where possible (as core or supplementary materials), and then create content when necessary to fill-in-the-gaps or improve the quality, will be critical (Vignare, 2007). Yes, you will even have intelligent agents to assist academics with assembling content relevant for their students' learning outcomes and challenges.

• Personalisation

As the field of 'Learning Analytics' evolves, learning systems will become more powerful in collecting and making sense of students' usage and input from online and offline learning activities (e.g. using Tin Can API standards). With the help of learning analytics, the system can more easily adapt and personalise the students' learning content, activities and paths. Academics will have intuitive visual dashboards, empowering them to monitor students' progress in real-time. They will have intelligent tools to predict the students' potential learning

outcomes, and (auto) recommend preventive measures to help students struggling with various aspects of a course.

The biggest challenge will be to integrate the data from the various systems students use in their 'Personal Learning Environments'. However, by 2020 most of these integration issues would have been resolved. As students will have access to all the system auto-generated feedback from their online interactions, it will be crucial for academics to master the art of providing value-added constructive feedback both online and offline,, which will encourage students to reflect deeper about their learning, and inspire further exploration beyond the subject.

• Mastery

Personalisation will empower students to learn at their own pace guided by learning paths negotiated and co-created with their facilitators. By 2020, the semester system will not be relevant, or used by most programmes. Instead, students will move on to the next learning outcome, task, problem-set, or challenge only when they have completed the pre-requisite levels. Much of the learning challenges will be gamified with levels, and students will receive scores and badges as they succeed (or acquire other gamified elements to motivate learning). Where no pre-requisite is required, students will be provided the flexibility to learn based on interest to encourage self-directed learning, curiosity and exploration throughout their learning curriculum, which was negotiated and co-created with their facilitators. All their work and contributions will be integrated into their personal e-portfolios automatically, which will be the most critical aspect of the students' learning evidence, which future employers would be interested in before eventually employing them.

Students won't be striving for grades anymore but for completing the learning challenges, so that they can move on to the next one. Imagine the student having 120 learning challenges to complete, and once he/she has completed all those challenges, he/she will get the certificate or degree. Whether the student take 4 years, or 1 year is really up to him/her.

- **Mobile**

Mobile learning is already a trend being implemented in various educational institutions, but will accelerate disruptively in the coming years, as we move into the era of innovation in wearable technologies. Not only will students be learning using their smart phones and tablets, but they will also be using their smart Glasses (of which Google Glass was an example), gloves, headsets, watches, and even suits to acquire more authentic and experiential learning experiences.

Imagine a student in the lab working on an experiment getting personalised visual guidance from their Smart Glass as they carry out the various tasks. The augmented reality layer will provide all the necessary information required to fully utilise all the equipment in the lab with a blink of an eye (through augmented pointers, text, video tutorials, etc.). This will free up time for the facilitator to engage students in more complex learning activities to inspire deeper learning.

Imagine being a lecturer knowing the names of all their students without even trying, thanks to facial recognition through your Smart Glass. Or recording your learning demo by a voice command, which you can then share directly to your students on YouTube within seconds (or even real-time). Although there will be confidentiality and privacy issues regarding the ease of record uninvited episodes, there is no doubt that such tools could impact the learning process positively (informED, 2013).

Yes, imagine using intelligent gloves, which will enhance responsive feeling when performing surgery or interacting with lab equipment. It provides visual cues as you carry out your mission. The wearable technologies will evolve significantly by 2020, and the real challenge will be how to use such tools creatively and effectively to facilitate more authentic and engaging learning experiences for students.

- **Gamification**

Gamifying or gamification of students learning activities and assessment using technology is a growing trend. Gamification is the process of using game thinking and game mechanics to solve problems and engage users (Zicherman, 2011). In learning terms, Gamification means turning the class content and the way students learn into a game with a rewards system, quests, experience levels, badges, and healthy competition. For example, Paul Andersen uses elements of game design to improve his AP Biology class (BozemanScience). The entire class revolves around Moodle (and Google Apps). Students complete levels to acquire experience points and move up the leader board. Gamification is used in applications and processes to improve user engagement, return on investment, data quality, timeliness, and learning (Herger, 2012).

Current and past research indicates that video games help stimulate the production of dopamine, a chemical that provokes learning by reinforcing neuronal connections and communications. Interestingly, educational game-play can also increase soft skills in learners, such as critical thinking, creative problem-solving, and teamwork. This idea is the basis of the relationship between games and education (Johnson *et al.*, 2013).

• Learning Analytics

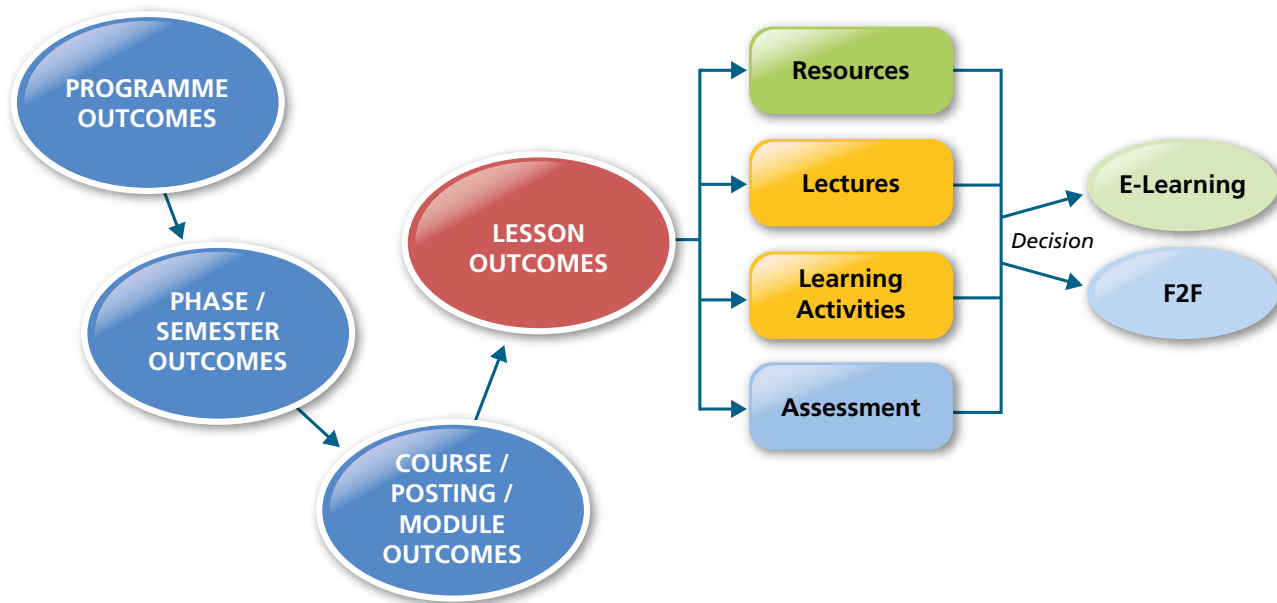
Learning analytics is the field associated with deciphering trends and patterns from educational big data, or huge sets of student-related data, to further the advancement of a personalised, supportive system of higher education.

The widespread adoption of learning and course management systems has refined the outcomes of learning analytics to look at students more precisely. Student-specific data can now be used to customise online course platforms and suggest learning resources.

Universities are already employing analytics software to make the advising process more efficient and accurate, while researchers are developing mobile software to coach students toward productive behaviours and habits that will lead to their success.

One of the most promising payoffs of this data is its potential to inform the design of instructional software and adaptive learning environments that respond to a student's progress in real-time, fostering more engagement in course material (Johnson *et al.*, 2013).

• Learning (Design)



As we will increasingly be overwhelmed with the amount of learning technologies at our disposal to transform learning, we should not forget quality 'Learning design' (and implementation), which will be the critical competitive factor that differentiates the best from the rest. Technologies can easily be copied and adopted.

But, quality 'Learning Design', which also involves human-to-human interaction, and the infusion of an innovative and inspiring learning culture is something that cannot be copied and adopted easily.

Quality learning design involves developing/reusing/remixing content that is aligned with learning outcomes, learning activities and assessment. Learning content should be chunked (1-5 minute units; remember 'Less is more') for all learning moments (and learning devices) with lots of interactivity and self-assessment embedded before, during and after, so that students can get immediate feedback, and personalised learning experiences guided by their actions as they learn. Learning through interactive e-books with video tutorials, simulation and self-assessments will be preferred compared to printed books.

Simulation (please refer to Chapter 13 for details) and scenario-based learning activities will be the norm by 2020. But to make it more authentic, these kind of learning activities will also take place through augmented reality or holographic visualisation using various devices. There will also be an increased focus on designing collaborative and social learning experiences for students both online and face-to-face (F2F), as team-based learning is also a critical skill to master for the working world.

Even in 2020, not all learning activities are appropriate to be done fully online, so we should always strive to find the right blend, whether it is online, or F2F or a combination of both. The key to success will be to find the right blend to stimulate more authentic learning experiences for the students in an engaging and effective manner.

By 2020, the Flipped Classroom concept will be a common method, as (mini) lectures would be made available online (chunked nicely for mobile learning), and classroom learning would only be necessary when there are collaborative learning (e.g. PBLs) activities required (unless it is in the lab). Students will be mostly

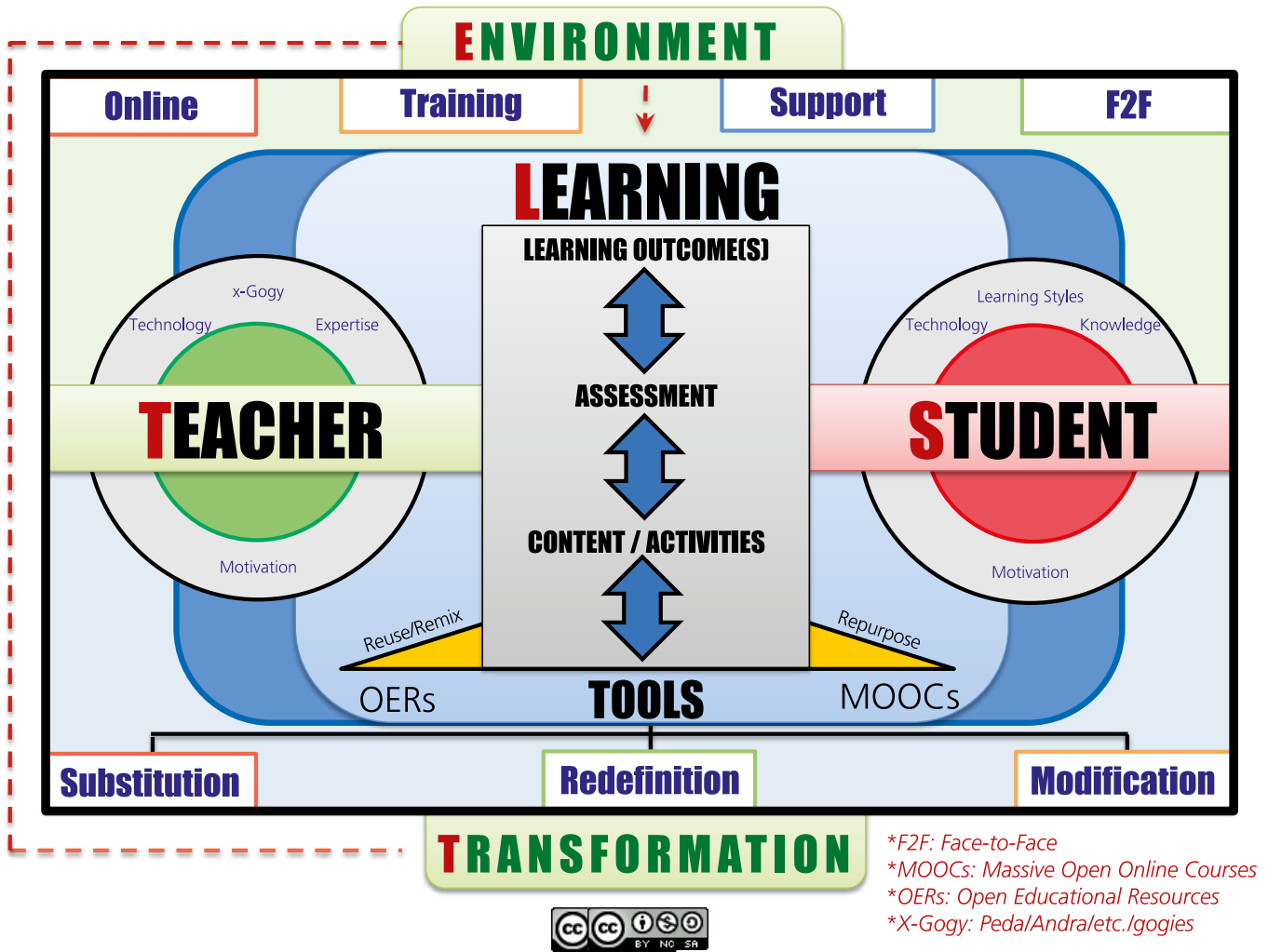


learning together in various learning spaces around the campus, such as small discussion rooms, open spaces, and cafes. Students will get together often using various web-conferencing software (e.g. Google Hangouts), and facilitators will join in when necessary.

In addition, assignments and projects will link up students from different universities around the world to encourage inter-cultural and multi-disciplinary collaborative learning.

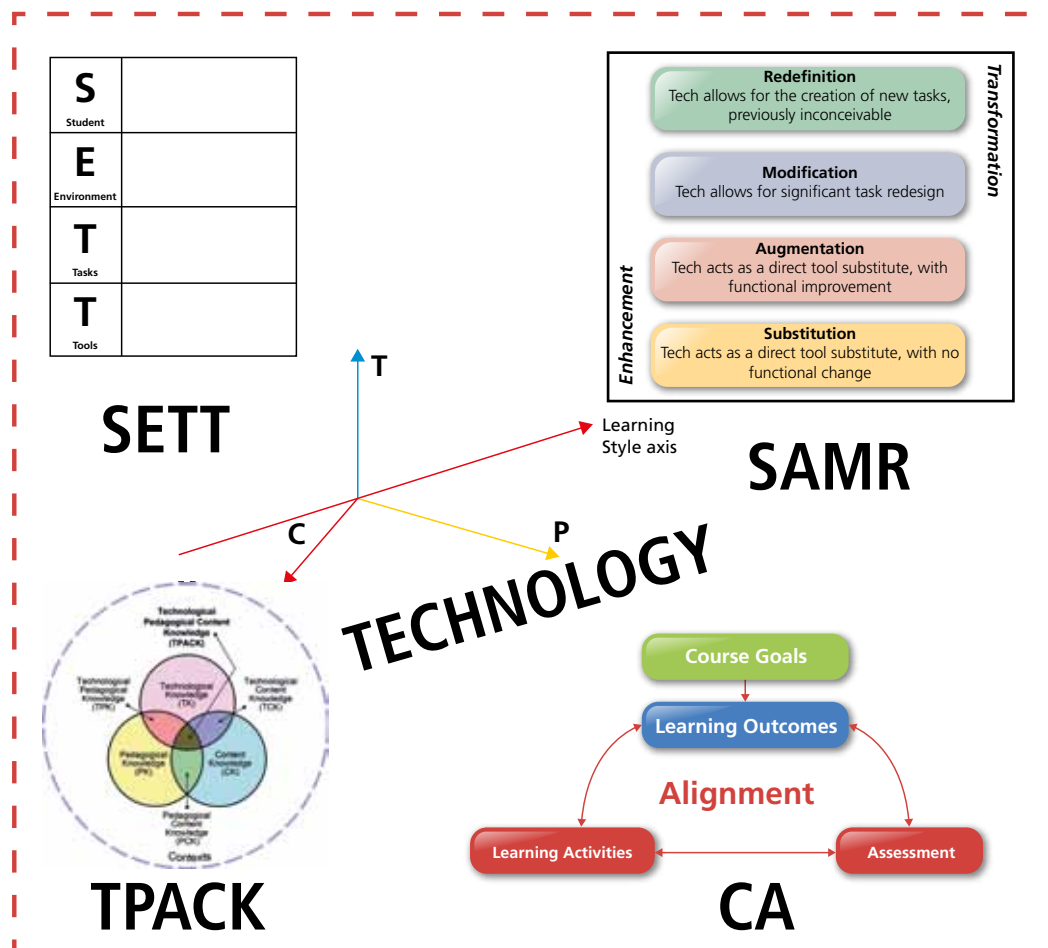
As you probably noticed by now, lecturers will no longer be the all-knowing keeper of knowledge who has all the answers. Instead, lecturers (or teachers) will be playing a critical role in the students' learning process, mostly through facilitation, coaching, guidance and/or mentoring. In other words, all these technologies won't replace the human teacher if she/he is ready to adapt to the new evolving world of learning.

Quality lecturers will be in high demand around the world, especially if they can design or facilitate relevant learning experiences that are challenging and fun for their students.



The TEST-Learning Framework (Alsagoff, 2013)

The TEST-Learning framework is a synthesised fusion of 5 existing learning frameworks:



More details: <http://www.slideshare.net/zaid/21st-century-educators-workshop-at-uthm>

The TEST-Learning framework is a comprehensive e-learning framework that identifies the essential components required to develop quality blended or fully online courses for the future at the IMU. The TEST-L acronym letters are sequenced in this manner, so that they can be easily remembered; not meant to be necessarily applied in chronological order.

Whatever learning tool or method we use, the focus should always be to improve the students' learning experiences, and strive towards designing learning activities and assessment, aligned with the learning outcomes we require students to learn.

Let's explore the TEST-Learning framework items in context with transforming IMU's learning and teaching environment:

No.	TEST-Learning Framework
1.0	ENVIRONMENT
1.1	F2F (Face-to-Face) <p>Whether you are learning (or facilitating) in the campus or online, the environment should be optimised to the transformative student learning experiences that the IMU aspires to design. Meaning, the IMU needs to rethink the campus physical learning spaces to be more conducive for future learning designs (with less F2F lectures, which are increasingly in i-lecture format or facilitated online through webinars), and have more smart learning rooms, which can be easily rearranged to support various types of learning methods (Flipped classroom, PBL sessions, simulations, group discussion, meetings, debates, collaborative learning, etc.).</p> <p>In addition, the IMU needs to invest more to transform the students' experiential aspect of learning, which includes student clubs, residential life, internships and international experiences (e.g. more learning field trips within and beyond Malaysia). These aspects cannot be effectively moved online (Gallagher & Garrett, 2013).</p> <p>The WiFi or LiFi (Internet access from 'Light'...in the future) and technical infrastructure must be sufficient to support all the interactive online and technology tools that we increasingly will integrate into the F2F learning environments (classroom, discussion rooms, research labs, simulation labs, etc.) to engage students and capture their learning input, so that we can monitor their progress and tailor the learning content and activities to their learning needs and requirements.</p>
1.2	Online <p>By 2020, lecturers and students will increasingly be using various online tools and mobile devices to support their Personal Learning Environments (PLE), and optimise their learning experiences. However, the IMU would still need a central learning platform to capture and make sense of the students' online and offline learning experiences, so that lecturers (mentors) can monitor the progress, and students can get continuous feedback from their learning activities in various modes (online, F2F, system-generated, etc.).</p> <p>As learning designs in the future will move away from grading and final exams, to competency-based assessment, project-based learning, gamification elements (levels, badges, score, etc.) and e-portfolios, the IMU needs to strategically work towards this in the coming years, and invest (or build) systems that can support such learning environments efficiently and effectively.</p> <p>Whether courses are blended or fully online, the ideal will be that the future learning management system will have mechanisms and tools to capture relevant learning output taking place wherever it might happen (e.g. using Tin Can API), and support all types of computer devices that users may use.</p>

No.	TEST-Learning Framework
1.3	<p>Training Training faculty (and students) in creative and effective ways whether online or F2F will be a critical competitive factor for IMU’s aspirations to become a leading university in Asia in the future.</p> <p>In particular, new faculty members will need to go through a proper induction programme (1-2 weeks) to adapt to IMU’s innovative learning culture and learning methods. The F2F aspect of the training could be shortened dramatically (1-2 days for hands-on activities and application) if we can make the rest available as an online course.</p> <p>The online course will be made available at any time, while the F2F component could be arranged 3-4 times a year to assess and verify that faculty can use e-learning and are fully capable of facilitating students during interactive F2F sessions. In other words, for the online course component they can get certified at any time, but the F2F component part of the certification is scheduled to ensure availability of trainers and faculty members.</p> <p>Besides continuous training on various teaching and learning tools, the e-learning and teaching license programmes should be designed in a more integrated manner, and increasingly delivered in a blended (flipped mode) or fully online mode. They should not be seen as separate licenses, and instead fused together as part of a comprehensive training programme for all new (and existing) academic staff.</p> <p>Also, by doing so, this comprehensive training programme (online or blended mode) could be a money generating programme, which could bring in significant external revenue if designed innovatively with high quality.</p>
1.4	<p>Support The Learning Resources Department, whether library, medical museum or e-learning needs to design more effective and efficient ways to provide support, tailored to the needs of the students and faculty (FAQs, phone, e-mail, chat, QR Codes, etc.).</p> <p>Besides real-time support, we need to explore and invest in intelligent (virtual assistants) systems and build knowledge bases that can assist users anytime, especially for issues that have been resolved previously.</p> <p>Whether courses are blended or fully online, the ideal will be that the future learning management system will have mechanisms and tools to capture relevant learning output taking place wherever it might happen (e.g. using Tin Can API), and support all types of computer devices that users may use.</p>

No.	TEST-Learning Framework
2.0	LEARNING (Design process)
2.1	<p>Learning Outcomes are: What knowledge, skills or attitudes do the students need to demonstrate or show?</p> <ul style="list-style-type: none"> • Measurable in a qualitative (e.g. rubrics) and/or quantitative (e.g. closed-ended questions) manner. • Stated clearly and written from the students' perspective (if possible, negotiated and even co-designed with the student). • Articulated and communicated to the students personally (online or F2F or recorded video). • Appropriately designed for the level of the course. <p>Learning outcomes are integrated into the curriculum map and are of 3 levels (programme, course and module/unit). Assessment, learning activities and content should be built around the learning outcomes.</p>
2.2	<p>Assessment How will students demonstrate their mastery of those learning outcomes?</p> <p>There is a saying 'Learning drives assessment', and if you make it fun, relevant and more formative, you have a winning formula for the future.</p> <p>Today, and increasingly in the future anyone will have access to 'world class' content (mostly for free) in basically any field, and what is going to really differentiate the best from the rest, is how you design the students' learning experiences, and provide continuous formative and summative assessment to guide the students throughout the learning process. The key here is to strive to design authentic (as much as possible) or simulated assessment in safe environments.</p> <p>So, even before developing materials, academics should focus first and more on designing quality and more authentic learning experiences and assessment aligned with the learning outcomes. Much of these assessment developed can be made available online in the form of quizzes, projects, simulations, scenario-based learning and games, so that students can continuously assess their learning and keep track of their progress.</p> <p>Also, at university level students should be expected to discover, research and find relevant content mostly by themselves to support their learning, and as we move towards developing content according to cases and problem sets (rather than topics), this becomes even more relevant.</p>

No.	TEST-Learning Framework
2.3	<p>Content/Activities</p> <p>What type of learning content/activities do the students need to do to master the learning outcomes?</p> <p>Before developing, reusing, remixing or even purchasing learning content, the learning outcomes (for a course) should be clear, and also how students are going to be assessed to achieve the learning outcomes that have been set.</p> <p>Once that is settled, then one should focus on designing the learning activities (cases, problem-sets, challenges, etc.) and content to drive the learning experiences.</p> <p>Content can come in the form of OER, MOOCs (self-developed or reuse), i-lectures, simulations, games, slides, videos, journal articles, web resources, etc. Instructional content should be chunked into short learning nuggets (1-5 min), which can then be assembled like Lego into various modules as relevant or needed.</p> <p>The key here is to think reuse/remix before developing new content (Don't reinvent what exists, especially if it is free to use). More importantly, is to design the learning activities that will empower engaging and deep learning experiences aligned with the learning outcomes.</p> <p>Developing quality content and activities for fully online courses compared to blended or flipped classroom learning environments differs (in terms of learner needs and requirements), and the IMU needs to consider outsourcing, or building a stronger team, as we embark on developing online courses or MOOCs.</p>
2.4	<p>Tools</p> <p>What tools can we use to create/remix the content and/or empower the learning activities to achieve the learning outcomes?</p> <p>Once we know the learning outcomes and have decided ideally how we want to access students, then lecturers and students need to decide on what tools to use to develop content, learning activities, collaboration, and assessment.</p> <p>Increasingly, we will be overwhelmed with options, and therefore the IMU needs to design (or reuse) an evolving decision matrix/aid/guide/wizard to simplify the process of matching the appropriate tools to the various learning requirements (e.g. blog for reflective journal).</p>

No.	TEST-Learning Framework
3.0	TEACHER (Role)
3.1	<p>X-Gogy</p> <p>First, 'Teacher' is a comprehensive word (Umbrella term) that should not be confused with the practice of lecturing only. Being a teacher (lecturer in university context) means much more, and it includes playing the role as a facilitator, coach, mentor, guide rather than just lecturing and assessing the students on the course content.</p> <p>As we embrace the future, teachers need to rethink the way they teach, and the term X-Gogy is used to represent all the variations we can see today in andragogy/ pedagogy/ heutagogy/ technogogy, etc. In other words, we should not get lost in the 'gogies', but instead define what is the role of a teacher in transforming the students' learning experiences, and how teachers can acquire the right technology and X-Gogy skills to master this art.</p> <p>As such, faculty need to be continuously trained online and F2F to master the various skills and attitudes required to learn and teach in the 21st century.</p>
3.2	<p>Expertise</p> <p>Students will increasingly demand that their teachers (lecturers) are content (subject area) experts in their areas/ subjects, or have the ability to facilitate students in learning what they have to learn.</p> <p>As students will increasingly have access to 'world class' content, communities and sometimes even experts (through resource sites, OER, MOOCs, and social media) online for free, the least they can demand is that their courses are facilitated by content experts who need not necessarily be physically present in the same venue as the student.</p>
3.3	<p>Technology</p> <p>Besides having X-Gogy and content expertise, teachers need to be trained on how to integrate and use technology effectively to curate/create/remix content, facilitate, and assess learning both in online and F2F environments.</p>
3.4	<p>Motivation</p> <p>As the demand on what lecturers need to know and do to facilitate student learning will increase, it is paramount for the IMU to keep them motivated and inspired.</p> <p>To do so, the key will be to remove most non-teaching administrative tasks from academics (automate, improve efficiency, outsource or hire support), provide training (often), more research time, and incentives to innovate through a transparent and efficient reward systems (awards, KPIs, bonus, titles, etc.).</p>

No.	TEST-Learning Framework
4.0	STUDENT (Role)
4.1	<p>Learning Styles</p> <p>Ideally, content and learning activities should be tailored to the various learning styles students have, which most Universities will strive to achieve as we move into the future.</p> <p>Though, the real differentiating factor would be to embrace an approach that encourages students to master various learning styles, which will be required as they join the working force.</p> <p>Designing a learning styles evaluation framework for them to measure their various learning styles, and embedding it into part of the curriculum as essential skills for students to develop and to encourage lifelong learning skills using any style.</p>
4.2	<p>Content</p> <p>Spoon-feeding all the course contents required is depriving the student from becoming real independent learners with the ability to curate and create their own learning content from various resources, to make decisions and problem solve clinical cases and challenges embedded in the curriculum.</p> <p>The key is to find a balance, by creating the essential content (e.g. learning nuggets) to trigger students to research deeper into each subject area they are studying using various resources from i-Library databases and other web resources. This will not only enrich the student's learning experience, but also enrich group/team and classroom learning discussions, as each student would have explored varied resources and ideas before connecting.</p> <p>For most students to go beyond just studying the course notes and i-lectures, the graded assessment itself must capture and value this, whether it is closed/open-ended/project or e-portfolio based evaluations.</p>
4.3	<p>Technology</p> <p>Young students in general are tech-savvy (for social activities), but not necessarily information literate or learning-savvy (learning how to learn) using technology. Therefore, it is critical that students who need to learn these skills by getting training (online/offline) and getting exposure to good practices in curating, finding, evaluating, organising, collaborating and sharing their discoveries, experiences and research output using various technologies.</p>
4.4	<p>Motivation</p> <p>Students of today, are not necessarily motivated to learn by the same goals and things that students of the past had to.</p> <p>Self-motivation to learn plays a critical role to inspire deep and passionate learning, and therefore it is important for lecturers to understand how, and be able to facilitate engaging learning environments that are relevant, challenging and fun.</p>

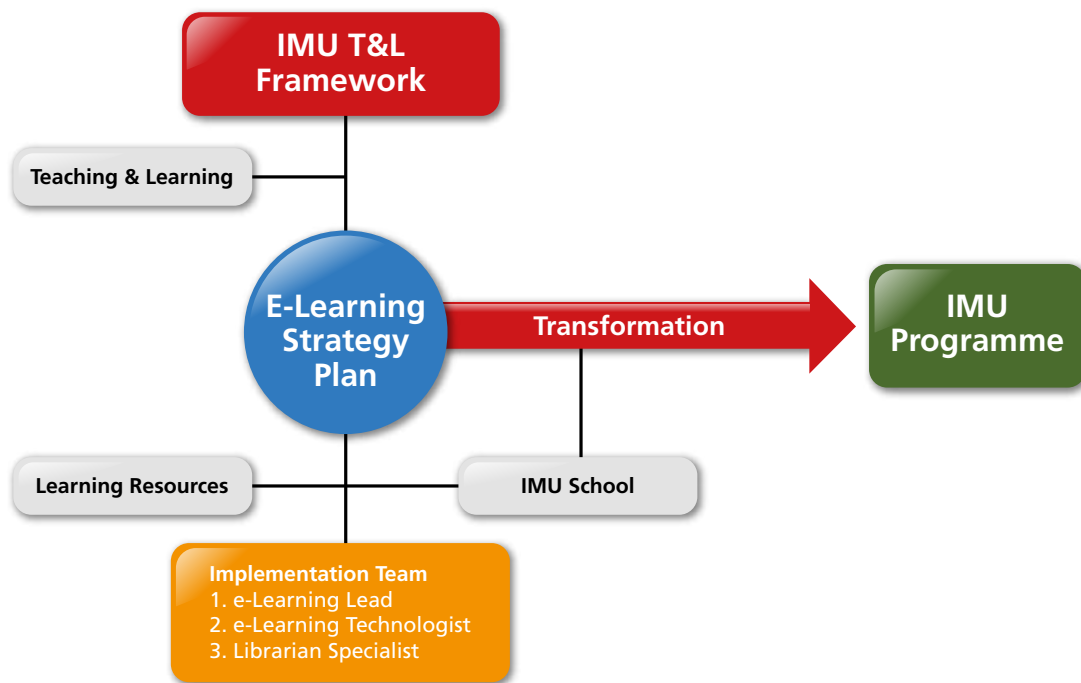
No.	TEST-Learning Framework
5.0	TRANSFORMATION
	<p>How do we know whether we are using technology to enhance or transform the students learning experiences?</p> <div><p>The diagram illustrates the SAMR model, showing four levels of technology integration arranged vertically within a rectangular frame. The left side of the frame is labeled 'Enhancement' and the right side is labeled 'Transformation'. The levels are as follows:</p><ul style="list-style-type: none">Redefinition (top, green box): Tech allows for the creation of new tasks, previously inconceivable.Modification (second from top, blue box): Tech allows for significant task redesign.Augmentation (third from top, orange box): Tech acts as a direct tool substitute, with functional improvement.Substitution (bottom, yellow box): Tech acts as a direct tool substitute, with no functional change.</div> <p>The Substitution Augmentation Modification Redefinition Model (SAMR) by Dr Ruben R. Puentedura (Puentedura, 2012a) (Puentedura, 2012b) offers a method of seeing how computer technology might impact teaching and learning. It also shows a progression that adopters of educational technology often follow as they progress through teaching and learning with technology.</p> <p>While one might argue over whether an activity can be defined as one level or another, the important concept to grasp here is the level of student engagement. One might well measure progression along these levels by looking at who is asking the important questions. As one moves along the continuum, computer technology becomes more important in the classroom but at the same time becomes more invisibly woven into the demands of good teaching and learning (Puentedura, 2012a).</p> <p>The SAMR model has been infused into the TEST-L framework to push academics to rethink the usage of technology and drive them towards using technology in a transformative manner.</p> <p>However, to simplify the differentiation, we have reduced the levels to 3 and adapted the SAMR model by leaving out 'Augmentation' from the model to now SMR.</p> <p>The SMR level is briefly explained with examples below:</p>

No.	TEST-Learning Framework
5.1	<p>Substitution</p> <p>Technology acts as a direct tool substitute with no functional change.</p> <p>Example:</p> <p>Reading a PDF file (article) instead of reading a hard copy version. Useful, but no major impact on the learning process itself, unless it can do things beyond the hard copy.</p>
5.2	<p>Modification</p> <p>Technology allows for significant task design.</p> <p>Example:</p> <p>The student’s assignment is create a short video documentary about their field trip to the Apple factory. Then, they are required to share it online in the portal for other students to view and comment.</p>
5.3	<p>Redefinition</p> <p>Technology allows for the creation of new tasks, previously inconceivable.</p> <p>Example:</p> <p>Students are required to collaborate online (e.g. using Google Drive, Hangouts and Community) in multi-disciplinary teams with members from various countries around the world working on a specific project.</p>
5.4	<p>Motivation</p> <p>Students of today, are not necessarily motivated to learn by the same goals and things that students of the past had to.</p> <p>Self-motivation to learn plays a critical role to inspire deep and passionate learning, and therefore it is important for lecturers to understand how, and be able to facilitate engaging learning environments that are relevant, challenging and fun.</p>
6.0	<p>CONTINUOUS EVALUATION & REDESIGN</p> <p>The introduction of new learning innovations and technologies will accelerate in the coming years (shorter life cycles), and therefore the IMU must continuously and vigorously explore new alternatives to enhance and transform the learning and teaching environment.</p> <p>But, the main focus must always be on enhancing and transforming the learning and teaching environment for the better, and not for the sake of the technology itself.</p>

10.4 The IMU's e-Learning Strategy

10.4.1 Purpose

This section provides guidelines on how each IMU School should prepare the e-learning strategy plans for their academic programmes and courses for the upcoming years.



10.4.2 Current Scenario

Currently, the e-Learning school champions are mostly responsible for working with the various schools to drive the e-learning agenda, and draft and finalise the e-learning strategy plans for the programmes with support from the e-learning team. No e-learning staff is directly assigned to assist, or work with them to give advice and finalise the implementation plans.

Several e-learning champions (new title: e-Learning Leads) do come and seek advice from IMU e-learning staff, but

it is very much done in an informal manner without any clear guidelines and assigned responsibility on behalf of the e-learning staff.

This approach could be setting too high expectations on the identified e-learning champions (who have other academic priorities, too) to facilitate the implementation effectively for each programme. Also, not all of the identified e-learning school champions may have the knowledge and expertise in the area of e-learning to guide the various schools appropriately to make the right decisions and goals.

10.4.3 Future Implementation Approach

To transform and drive the teaching and learning environment using e-learning for the future at the IMU, this document proposes that each school will have an assigned e-Learning Technologist (one e-learning staff with expertise in e-learning) and Library expert to work with the e-Learning Lead to drive the e-learning agenda for each programme, and assist in preparing the e-learning strategy plan with advice and guidance.

The proposed e-learning Implementation Team for each programme will consist of a/an:

- **e-Learning Lead**

The leader and school representative who will be responsible for leading and coordinating with the school to strategise how the programme should use e-learning to enhance or transform the learning and teaching environment. Each school will be responsible for identifying the e-Learning Lead(s) for their programme(s). The e-Learning Lead will work closely with the assigned e-Learning Technologist and Information Specialist to conceptualise the e-learning strategy plan (short and long-term) and monitor the progress as it is being implemented.

- **e-Learning Technologist**

The e-Learning Unit will assign one e-Learning Technologist to work with each e-Learning School Champion to strategise and drive the e-Learning agenda forward for each IMU programme. The e-Learning Technologist should attend all School related meetings that discuss e-learning issues, and be pro-active in providing e-learning related advice and guidance. 50% of the e-Learning Technologist's KPI will be based on the e-Learning progress made by their assigned school(s). Some e-Learning Technologists will be assigned to more

than one programme (or school), due to manpower shortage, and the extensiveness of the school's e-Learning requirements and needs.

- **Librarian Specialist**

The Library Unit will assign one Library expert to be part of the e-Learning Implementation Team to provide guidance on how the (interactive) digital resources (e.g. e-books, simulations, images, videos) in the i-Library can be integrated and used to enhance the e-learning content for each course in the programmes. Some Library experts will be assigned to more than one programme, due to manpower shortage, and the extensiveness of the school's e-learning requirements and needs.

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10.6 Appendices

10.6.1 Definitions: Learning Technologies & Trends

• Mobile Learning

“Learning that takes place via such wireless devices as smart phones, tablets, personal digital assistants (PDAs), or laptop computers.”

According to John Traxler, methodologies specifically aligned to the unique attributes of mobile learning and “Attempts to develop the conceptualisations and evaluation of mobile learning, however, must recognise that mobile learning is essentially personal, contextual, and situated; this means it is ‘noisy’ and this is problematic both for definition and for evaluation.” According to him mobile, personal, and wireless devices (smart) are going to change the way we interact, communicate, commerce, collaborate and even learn; the relationships between education, society, and technology are now more dynamic than ever. (Traxler, 2005, 2010)

The role of mobile learning tools and technologies in learning is becoming very important. Learners are equipped with a variety of Mobile Smart Devices (MSD). The learner of the 21st century with access to all these tools and technologies would not be sitting in the class in a passive mode and absorb knowledge. These new learners would like to have the same level of access, mobility, flexibility, immediacy, personalisation as they have while working or in their personal life. e-Learning model should be aligned with the IMU Learning Model. When we design e-learning we need to keep in mind that e-Learning is not going to replace our face-to-face learning. It will complement face-to-face learning.

Mobile learning is the future of workplace learning and social learning. It is not the mobility of the technology

that is important in mobile learning, but the mobility and flexibility of contents, facilitators and learners. Evaluating mobile learning is a challenge as learning takes place in different scenarios and context using different devices.

We need to focus on having a blend of face-to-face, e-Learning, mobile learning, discovery-enabled learning, project based learning, peer supported learning, and collaborative learning activities while designing the programme.

• Social Media

“Social media refers to the means of interaction among people in which they create, share, and/or exchange information and ideas in virtual communities and networks (e.g. Facebook, Twitter, Google+)...” *Wikipedia*

• Personal Learning Environments (PLE)

“The term personal learning environment (PLE) describes the tools, communities, and services that constitute the individual educational platforms that learners use to direct their own learning and pursue educational goals.” *Source*

• Web Conferencing

“Web conferencing refers to a service that allows conferencing events to be shared with remote locations. These are sometimes referred to as webinars or, for interactive conferences, online workshops.” *Source*

• Flipped Classroom

“The flipped classroom is a pedagogical model in which the typical lecture and homework elements of a course are reversed. Short video lectures are viewed by students at home before the class session, while in-class time is devoted to exercises, projects, or discussions.” (Initiative, E. L., 2012)

- **e-Portfolio**

“An electronic portfolio (also known as an eportfolio, e-portfolio, or digital portfolio) is a collection of electronic evidence assembled and managed by a user, usually on the Web. Such electronic evidence may include inputted text, electronic files, images, multimedia, blog entries, and hyperlinks. E-portfolios are both demonstrations of the user’s abilities and platforms for self-expression, and, if they are online, they can be maintained dynamically over time”. *Wikipedia*

- **e-Books**

“E-books offer new ways for readers to interact with content. An e-book that abandons the notion of reading from front to back, for example, encourages readers to take an active, self-directed role in how they learn. E-books incorporating audio, movies, and simulations facilitate deeper understanding of subject matter, while annotation features let users customise a text.” *Source*

- **Simulation**

“Simulation” is a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion. Gaba (2004) stresses that simulation should be interpreted as a strategy – not a technology – to mirror, anticipate, or amplify real situations with guided experiences in a fully interactive way.

- **Gamification**

“Gamification techniques strive to leverage people’s natural desires for competition, achievement, status, self-expression, altruism, and closure. A core gamification strategy is reward for players who accomplish desired tasks. Types of rewards include points, achievement badges or levels, the filling of a progress bar, and providing the user with virtual currency. Competition

is another element of games that can be used in gamification. Making the rewards for accomplishing tasks visible to other players or providing leader boards are ways of encouraging players to compete. Another approach to gamification is to make existing tasks feel more like games. Some techniques used in this approach include adding meaningful choice, onboarding with a tutorial, increasing challenge, and adding narrative.” *Source*

- **Wearable Technologies**

“Wearable technology refers to devices that can be worn by users, taking the form of an accessory such as jewellery, sunglasses, a backpack, or even actual items of clothing such as shoes or a jacket. The benefit of wearable technology is that it can conveniently integrate tools, devices, power needs, and connectivity within a user’s everyday life and movements. Google’s “Project Glass” features one of the most talked about current examples — the device resembles a pair of glasses, but with a single lens. A user can see information about their surroundings displayed in front of them, such as the names of friends who are in close proximity, or nearby places to access data that would be relevant to a research project. Wearable technology is still very new, but one can easily imagine accessories such as gloves that enhance the user’s ability to feel or control something they are not directly touching.” *Source*

- **Situated Learning**

“Situated learning was first proposed by Jean Lave and Etienne Wenger as a model of learning in a community of practice. At its simplest, situated learning is learning that takes place in the same context in which it is applied.” *Wikipedia*

- **Massive Open Online Courses (MOOCs)**

“A type of online course aimed at large-scale participation and open access via the web. MOOCs are a recent development in the area of distance education, and a progression of the kind of open education ideals suggested by open educational resources. MOOCs typically do not offer credits awarded to paying students at schools, but assessment of learning may be done for certification.” *Source*

- **Open Educational Resources (OER)**

“Open Educational Resources (OER) are freely accessible, usually openly licensed documents and media that are useful for teaching, learning, educational, assessment and research purposes.” *Wikipedia*

- **Creative Commons (CC)**

“Creative Commons helps you share your knowledge and creativity with the world. It develops, supports, and stewards legal and technical infrastructure that maximises digital creativity, sharing, and innovation.” *Source*

- **Learning Analytics**

“Learning analytics is an emergent field of research that aspires to use data analysis to inform decisions made on every tier of the educational system. Whereas analysts in business use consumer-related data to target potential customers and thus personalise advertising, learning analytics leverages student-related data to build better pedagogies, target at-risk student populations, and to assess whether programmes designed to improve retention have been effective and should be sustained — important outcomes for administrators, policy makers, and legislators. For educators and researchers, learning analytics has been crucial to gaining insights about student interaction with online texts and courseware. Students are also benefiting from the deliverables of learning analytics, through the development of mobile

software and online platforms that use student-specific data to tailor support systems that suit their learning needs.” *Source*

- **Tin Can API**

The Tin Can API (sometimes known as the Experience API) is a brand new specification for learning technology that makes it possible to collect data about the wide range of experiences a person has (online and offline). This API captures data in a consistent format about a person or group’s activities from many technologies. Very different systems are able to securely communicate by capturing and sharing this stream of activities using Tin Can’s simple vocabulary (For more information: <http://tincanapi.com/overview/>).

- **Collaborative Learning**

Collaborative learning is a situation in which two or more people learn or attempt to learn something together. Unlike individual learning, people engaged in collaborative learning capitalise on one another’s resources and skills (asking one another for information, evaluating one another’s ideas, monitoring one another’s work, etc.). More specifically, collaborative learning is based on the model that knowledge can be created within a population where members actively interact by sharing experiences and take on asymmetry roles

i. (http://en.wikipedia.org/wiki/Collaborative_learning).

ii. Need to focus on

iii. Collaboration among peers

iv. Collaboration with contents

v. Collaboration with global experts

vi. Collaboration with partner University

10.6.2: Case Studies

The International Virtual Medical School (IVIMEDS) (<http://www.ivimeds.org/>) and the Virtual Campus of the King's College of University of London (<http://gktvc1.kcl.ac.uk/>) are examples of e-learning training at the undergraduate, residency, and continuing professional levels.

At the national and international levels, a number of initiatives have emerged with the purpose of creating a digital repository of peer-reviewed electronic resources for public dissemination [<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2631188/#B3>]. Some of the examples include:

- MedEd Portal by Association of American Medical Colleges (<http://www.aamc.org/mededportal>)

- End of Life/Palliative Education Resource Centre by Medical College of Wisconsin (<http://www.eperc.mcw.edu/>)

- The Health Education Assets Library (HEAL, <http://www.healcentral.org/>), Multimedia Educational Resource for Learning and On-line Teaching (MERLOT, <http://www.merlot.org>), and

- Family Medicine Digital Resource Library (<http://fmdrl.org>).

10.6.3 Visualising Future Learning Experiences

How will the learning and teaching environment look like at IMU in 2020? This section, explores 4 cases (1 lecturer and 3 Students) on how a learning and teaching day might look like in 2020.



Lecturer - Medical School

The first case visualises how a lecturer (Dr Gunar, Medical School) from IMU experiences a working day at IMU in the year 2020. By 2020, most administrative activities are taken care of by virtual assistants (with artificial intelligence), meaning lecturers can focus 95% on their time on facilitation/coaching/mentoring, research and learning.

Time	Working Day
7:00 am	<p>After Dr Gunar has had his breakfast, his virtual assistant displays on the tablet in a dashboard format (tablet) his students’ progress through diagrams, charts, bars and tables (looks a bit like a Ferrari dashboard). Through color-coding he can easily see who are progressing well and who are not. If the student is under-performing, or not doing their assigned tasks according to their co-created and negotiated learning timetables he/she is automatically notified.</p> <p>After checking the daily progress dashboard, he gets a visual and oral briefing of his working day ahead by his virtual assistant. Today, he needs to update one online learning nugget (1-3 minute video tutorial), facilitate an online PBL and one F2F learning session with his students, attend a reflective practice session with his peers, and participate in an online research group session on a collaborative project, which also involves 3 Partner Universities. Busy day ahead!</p>
7:45 am	<p>At 7:40 am, he is alerted that Lee (student) is struggling with his project and would like to meet up as soon as possible, as his deadline is looming. As Dr Gunar is free at 8:30 am, he messages back to Lee via the Universities social networking hub (IMU@Social) about the scheduled time. Lee agrees within seconds.</p>
8:30 am	<p>Dr Gunar and Lee uses Google Hangouts to discuss Lee’s project. Lee opens his Google Docs document and annotates where he is struggling, which seems to be the 3D modelling of correct surgery of the hip using laser treatment. Dr Gunar quickly points out the problem area, but does not reveal the answer. Lee realises by Dr Gunar’s action what is wrong, and then tweaks it until he gets it right with the help of the nano-quick-research method provided by his virtual learning assistant. The mentoring session is finished within 15 minutes.</p>
8:45 am	<p>At 8:45 am, Dr Gunar spends 15 minutes to update his video tutorial on ‘Cell Division’, which included some errors earlier. How? He uses his Smart (Google) Glasses to view the errors, and then updates it on-the-spot using augmented reality, which enables him through hand movement (interactive gloves) to remove the errors and update it correctly. The moment the tutorial is updated correctly, the students are notified and they can access it from the e-Learning Portal.</p>
9:00 am	<p>At 9:02 am, he bumps into Dr Omar and has a light chat about some teething issues happening at the faculty. Time passes quickly, and it is soon time for today’s online PBL session with his students.</p>

Time	Working Day
9:30 am	<p>At 9:30 am, the online PBL session starts. Dr Gunar instructs students to view the simulated virtual patient case trigger in IMU's 3D Virtual Hospital, and then break into online groups to discuss and solve the case after completing the mini-quiz.</p> <p>First, all students must complete the 5 questions (4 multiple-choice and 1 short essay) related to the PBL trigger within 10 minutes. Only after that, they are assigned to do group activity. The online discussion groups are auto-generated (randomly grouping students), and then they are free to interact with the virtual patient and all the surrounding virtual cues as they find an appropriate solution to the case.</p> <p>Dr Gunar can choose to give all the groups different virtual patient triggers, or the same trigger. On this occasion, he decided to give the same virtual patient trigger to see how the different groups deal with the same virtual patient (each group cannot see what the other groups are doing). There are 7 groups (5 students in each), and Dr Gunar is able to view 7 different screens from the facilitator's dashboard on his tablet, and then zoom in to any of the groups learning space as they interact with the virtual patient.</p> <p>Students can interact with the virtual patient by voice recognition or chat, but group members are recommended to discuss online among each other before interacting with the virtual patient. As such, Dr Gunar has assigned one leader in each group to lead the interaction with the virtual patient. All the online discussions are captured and archived, and then once the groups think they have found the right solution, they need to summarise their answer in a wiki document, which is automatically made available to Dr Gunar.</p> <p>To give the students more time to discuss further and reflect on their actions taken, Dr Gunar gives them 24 hours to submit their case reports. The interactive online PBL is over within 54 minutes, but students still need to hook up online to complete their case reports, unless they can complete them within the online session.</p>
10:30 am	At 10:30 am, Dr Gunar takes a break with his colleagues at the Coffee House in the library.
11:00 am	<p>At 10:55 am, Dr Gunar enters the learning room (at IMU campus) to get ready for the F2F learning session with his students. It is a round-the-table learning discussion, whereby students (only 10) are required first to present (in 2 minutes) each their findings from their individual projects, and then get immediate feedback from their peers and the facilitator. This learning session, encourages students to improve their presentation skills (being concise and precise), ability to give and receive constructive feedback, active listening skills, and build relationships in a team-mode learning environment.</p> <p>These kind of learning sessions usually goes on for 1 to 1½ hours, and are extremely popular among students.</p>

Time	Working Day
12:30 pm	Dr Gunar is now exhausted (but excited), and heads of for lunch at IMU's super canteen (He chose not to reveal what he ate, but I can assure you it looked delicious).
2:00 pm	<p>At 2:00 pm, Dr Gunar goes online (webinar) to attend and participate in a reflective learning practice session (6-8 lecturers) with his peers from IMU and four other partner schools to discuss how they are innovating their learning methods using various approaches and tools. This kind of sessions usually lasts about 60 minutes.</p> <p>Every week (during different times according to lecturers' schedules), groups are randomly generated (through the system) to meet up and share their best practices to encourage a culture of learning and sharing, which is essential in a learning organisation.</p> <p>To ensure that lecturers don't all come to the session empty-handed, all lecturers are required to prepare something for the sessions (an interesting article to discuss, a tool, a method, etc.). All this is shared in the Wiki (written reflections) or online folder (files shared) on the e-Learning portal.</p>
3:00 pm	From 3:06 pm until 4:30 pm, Dr Gunar is busy working on his research project.
4:30 pm	At 4:30 pm, Dr Gunar goes home for a quick rest, before he plays a game of tennis (doubles) with a few of his good friends.
7:00 pm	At 7:00 pm, he has dinner with his wife at home.
8:30 pm	<p>At 8:30, he attends an online research group session (webinar) from home with various researchers from IMU and 3 partner schools. They are working on a collaborative research project that might have a major impact on the world of education in the near future.</p> <p>As the session is so interesting and important, they go on until 11:00 pm. If you are working on a big project that might change the world of education, time flies! But at 11:00 pm, Dr Gunar is ready for some Delta-Brain-Wave sleep. Good night!</p>

Student - Medical School

The second case explores how a first-year Medical student from Mexico (Diego) experiences a learning day at IMU in the year 2020.

Time	Learning Day
6:00 am	A brain-wave stimulating alarm clock wakes up Diego gently with gentle music pleasing to the ears. While brushing his teeth, the daily time-table of learning activities are displayed on his tablet device in front of him.
6:15 am	After a quick jog, Diego had his weekly online chat with his parents. He has his breakfast of nasi lemak, though he misses his mum’s chilaquiles and burritos (especially after he has had a chat with them).
7:00 am	Diego has a quick look at his schedule for the day. During the morning he has three lectures, two of them back-to-back. He was able to review two of the lectures through the e-learning portal the previous night. These days, the module guides for his lessons has links to resources and he is expected prepare for his lessons before he comes to any class.
8:30 am	In addition to links to learning resources, the e-learning portal contains simulations and assessments. Diego had gone through one of the assessments the previous night and although he had scored rather badly in it, the feedback from the assessments gave him a good idea on which areas he needed to improve on. Diego likes these types of assessments, as it helped drive his learning and it approximates what could appear in his finals.
9:00 am	His first lecture starts at 9am and the lecturer began by summarising the main points of the lecture. This was followed by a discussion about related cases to the topic. Lectures in this form are much more interactive as students are able to see the application of the facts. Students are able to discuss the issues involved using the online forum and the Q&A allows students to clarify matters with their lecturers.
1:00 pm	Diego had queries on a side-topic which appeared during the lectures. He followed up by enquiring through the curriculum database and this led him to discover that some of what he wanted to know also appears in the nursing and pharmacy programmes. He was able to bookmark these lessons through the individualised learning plan which existed in the student portal and he set aside reminders for him to follow up later that night.
3:00 pm	The afternoon was spent working on a group project with the rest of his colleagues. Students are able to bring their own mobile devices and can work using collaborative applications.
6:00 pm	After an evening round of sports and games, Diego checks his mobile devices to see what is on for tomorrow’s lessons. By looking at the online timetable, he could see the various lessons and links which he could look up.
7:00 pm	After dinner, Diego reviews the lessons of the day. He discusses with his friends, he forms book marks and links his lessons to his personal portfolio, and personalises lessons on his private online learning page on the student portal with his extracurricular achievements.

Student - Nursing

The third case explores how a second-year Nursing student from Sabah (Sarah) experiences a learning day at IMU in the year 2020.

Time	Learning Day
6:15 am	Sarah wakes up at 6:15 am every day. She uses a bio-feedback device during the night to ensure that she gets her 2-3 hour Delta-Brain-Wave sleep (so that her previous day's learning is properly digested into long-term memory). Before taking a shower and eating breakfast, she does her favourite 1-minute speed workout and daily 'Super Brain Yoga' (2-3 minutes) to stimulate her mind into Alpha mode for the day, which enables her to focus better and enhance her memory capacity for the learning day ahead.
7:00 am	At 7:00 am, she gets a 5-minute visual and oral briefing from her virtual learning assistant about the learning menu for the day from her smart tablet. Today she will be working with a multi-disciplinary team on a virtual patient case. The multi-disciplinary team consists of 5 students (including her) from various universities and countries around the world (a medical, a chiropractic, a pharmacy and a Chinese medicine student). She is really looking forward to this enriching multi-disciplinary and inter-cultural online learning experience.
8:00 am	<p>At 8:01 am (Kuala Lumpur time) she logs into IMU 3D Virtual Hospital, and excitingly all the other members from her multi-disciplinary team are already online ready to discuss the virtual patient's case. The mission of this case, is to find the best treatment to deal with the patient's injured back. After the team discusses the patient's profile, history and lab tests taken earlier, they each share their concerns and provide their input on how the patient can best be treated to recover from the back injury and prevent it from reoccurring (unnecessarily).</p> <p>Sarah is really fascinated to learn how the medical, chiropractic, pharmacy, and Chinese medicine students would tackle the patient's back injury using their approaches to healing. The collaborative learning session lasts for 1 hour and 30 minutes, and everything of value is documented in an online wiki, which will be shared to their respective mentors after the session (and others as they like).</p>
9:30 am	After the session, Sarah chills out with her friends and shares some of her insights learned during the online collaboration exercise.
10:00 am	At 10:03 am, Sarah sits down to document her own reflections on dealing with the virtual patient and multi-disciplinary team from around the world in her reflective journal (blog), which is part of her e-portfolio. She spends nearly an hour writing down her experiences and reflections regarding it.
11:15 am	At 11:15 am, she attends a 45-minute webinar by Professor Gogenham from Harvard University Medical School (one of IMU's partner schools) about the latest healthcare treatments in dealing with back injuries. Sarah is totally fascinated to listen to the Professor, and does not shy away from asking him a question through the chat window related to her earlier virtual case scenario.

Time	Learning Day
12:00 pm	After the webinar, Sarah is ready for a break with a friends, and heads off to the IMU campus canteen for lunch. She can't resist her favourite Tandoori chicken with butter paratha coupled with a glass of fresh kiwi. IMU's canteen was voted the best food court in the whole of Bukit Jalil in 2019, so students are basically spoilt for choice.
1:30 pm	At 1:30 pm, she has a small group learning session at IMU campus facilitated by Doctor Gunar (her mentor, too). The group session consists of 10 IMU students, and all experienced different multi-disciplinary team virtual patient cases during the morning. So, during this session, all the members share their stories and they discuss the outcomes, experiences and how each case was resolved. As the session was so exciting and enriched with many AHA-learning moments, it went on for nearly 2 hours.
3:30 pm	At 3:34 pm, Sarah goes to IMU gym for a 30-minute Pilate's session, which is led by Fatima (who is besides being an IMU student, also a certified Pilate's instructor).
4:30 pm	At 4:31 pm, Sarah logs onto IMU e-Learning Portal to explore the interactive simulated courseware on providing care for people with various back injuries. She does first the pre-test, and then she is assessed while doing the courseware module (2-3 minute intervals) and then finally assessed again after she has completed it (multiple-choice, fill-in-the-blanks, drag-and-drop, hotspot and short essay type questions). All this is formative assessment for her learning purposes, so she has nothing to worry about except learning. Besides, the formative assessment has embedded gamification elements, which includes scoring, levels and badges after completing various modules in the courseware. This daily formative assessment provides continuous feedback on her learning, and empowers her mentor to follow up on her progress as she learns. After an hour she has completed her formal learning day.
6:00 pm	at 6:02 pm, she returns to her hostel to relax a bit, before heading for dinner with her friends at KFC at 7:00 pm.
7:00 pm	While waiting for her friends to arrive at KFC, she can't resist watching a learning nugget (3-minute learning video) through her Smart (Google) Glasses, providing tips on how to establish a personal rapport with patients.
10:00 pm	She is done having fun with her friends, and then returns to her hostel. She watches her favourite TV programme before getting ready for sleep at 10:30 pm. However, before sleeping she gets her virtual assistant to recap what has been learned during the day, and then configures her bio-feedback device to sooth her into a 2-3 hour Delta-Brain-Wave sleep during the night to ensure that the learning taken place is internalised (as much as possible) into long term memory. Good night!

Student - Dentistry

The fourth case, explores how a Dentistry student (Joshua) experiences a learning day at the IMU in the year 2020.

Time	Learning Day
6:00 am	Joshua awakens to the sweet sounds of Beethoven’s Ninth oozing out melodiously from his iPhone 10. The second the phone’s motion sensor detects that he is sitting up, the music shifts to a fast-paced zumba beat and video-syncs with the television for him to complete his 15 minute workout. A quick shower and change with a few spoonfuls of cereal, and he’s ready to hit the highway. While, cruising at 80 km/h on his way to IMU, he listens to a podcast about ‘Trauma related to road accidents’. Traffic is at standstill at many places and his phone rattles of his list of activities for the day in the voice he admires most - his girlfriend’s. As he approaches the IMU, and parks the car at the entrance, a lift door silently opens and whisks him and the car to the 12th floor parking lot.
8:00 am	After a 20-minute Q & A session with his lecturer based on the i-lectures, Joshua heads off to the library where his eye scan activates the computer which gives a personal greeting and displays the challenge for the day – a scenario of a patient in a Road-Traffic Accident (RTA). He must have the short and long-term management planned by the end of the day together with his other healthcare batch mates – from medicine, chiropractic, pharmacy, psychology and nursing. As they join him in the Collaborative Study Area, the discussion is lively and animated.
10:00 am	Time for the Sim Lab, and he heads there to perfect his implant placement skills via a haptic technology simulator. This is a patient case he has in the afternoon and he has to score 90% and above to be eligible to treat. He moves the tools effortlessly putting just the right amount of pressure on the bone drill as he hones in on the implant area creating a depth cut. Instant feedback from the simulator reassures him of a 97% score and suggests how he could have made it a full score. In the supervisors’ area, his mentor Dr Lim monitors his progress and nods approvingly at him. Instead of only seeing the end product of the placed implant, Dr Lim can review the entire process, and give appropriate instruction too.
1:00 pm	It is lunch time, and Joshua breezes into IMU’s cafeteria, grabs a steaming cappuccino from Starbuck’s and a quarter chicken from Nando’s, both of which he had ordered a half hour ago from his tablet. He joins his mates at the table and they discuss the case they have all been presented with. Each takes away their learning outcomes and agree to meet after class in the evening.
5:30 pm	Some of his multi-disciplinary colleagues have had to leave, but they meet up for video chat and they discuss the case. Joshua learns much from his other colleagues on the management of the RTA case and they learn much about facial and dental injuries from him.
7:00 pm	Joshua logs into IMU’s portal and shares his reflections on the case of the day, and his colleagues and supervisor have a brief discussion on where he could have improved his communication with the patient rather than leave the patient to view the post-op instructional video alone.
8:00 pm	He religiously opens his Facebook and plays the Candy Crush Saga game before chatting with his friends on the frenetic activities of the day. Whilst doing that he is scouring PubMed for the latest publications on facial trauma to finalise his presentation to all the Deans of IMU the next morning. Joshua then goes off the grid to enjoy some quiet time with Dan Brown’s The Da Vinci Code.

ENGLISH AND THE HUMANITIES IN THE IMU

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11.1 Preamble

The International Medical University (IMU) was established on the premise that it has to be international. The concept of being international then, was the essence of the IMU, through its international partnerships, faculty and students. Unsaid but implicit in being international is benchmarking against international best practices. Other ramifications such as teaching-learning activities, curriculum, research, staff and student mobility etc. would come out of this. To remain and further develop this principle of being international, English is critical. As a world language, English is not only spoken by the most number of people (1.8 billion) as a native and second language, but is the language of international communication.

Another reason for establishing the IMU was the aim to produce caring doctors with good core values. Humanities, or the study of human culture, encompassing literature, philosophy, history, including the broad area of the social sciences, is a means to instil core values including being caring, which is so important in healthcare professionals. The aim of exposing students to the Humanities is to provide an understanding of the human condition.

11.2 Introduction

The following sections will firstly situate the role of English and the Humanities in health education in the IMU. The role of English will be viewed through its impact as a global language that requires the organisation as a whole to consolidate efforts to ensure an acceptable level of English proficiency for staff and students to ensure effective communication in healthcare. The move towards introducing a broad education and integrating values in the culture of the organisation will examine the role of the Humanities in nurturing compassion, empathy, care and dedication among staff and students. The next section

provides a situational analysis of current practices in the IMU and attitudes among staff and students towards use of English and the Humanities in the organisation.

To gauge the level of use and proficiency of English within the organisation among staff and students, a student profile of performance by programme was assembled and a survey of student and staff attitudes towards English was conducted. To reveal the depth of engagement in the Humanities, staff satisfaction and student involvement in the IMU clubs and societies were surveyed.

11.3 Background to English and the Humanities

11.3.1 Importance of English in Health Professions Education

With the development of globalisation, intercultural communication has become more frequent and more significant than ever before. English has taken its place as the 'lingua franca' for cross cultural communication. English plays an essential role in health professions education as almost all medical knowledge available is in English. Students, faculty and researchers need to use English for teaching, learning and research activities for effective communication. The vital role that English plays makes it the agent for change as well as international benchmarking .

Medicine is considered as a global profession with knowledge that has traditionally transcended borders for the benefit of the world population (Perez-Gomez & Ramos-Zuniga, 2012). Towards this end, it is essential to have a curriculum incorporating international standards to ensure compatibility with medical education overseas and which is also in agreement with global projects. The global independent Commission on the Education of Health Professionals for the 21st Century (Frenk et. al., 2011) concludes that "all health professionals in all countries

should be educated to mobilise knowledge and to engage in critical reasoning and ethical conduct so that they are competent to participate in patient and population-centred health systems as members of locally responsive and globally connected teams.” Education and training in English will be a strategic axis that will allow us to reach such global concepts.

The curriculum framework must be developed to meet the needs of the educational institution, the students, relevant legislation, and any other stakeholders such as employers of the students. The aim is an ability to work using the English language, safely and competently (Milosavljevi, 2008). The IMU upholds an English-speaking policy that acts to advance English in all communications on campus. The measures to enforce this policy include monitoring by the Admissions Committee to ensure a robust first-line screening of candidates’ English language proficiency for a medical university, especially for professional programmes. They are also responsible to ensure that students who enrol will most likely succeed in the programme.

Current methods of instruction most commonly used today for health professionals focus primarily on the English language while embedding health care terminology in the lessons. Institutes of higher education where English is the medium of instruction may receive students for whom English is not the first language. The courses developed employ principles of English for Academic Purposes (EAP) with the aim to teach content that is matched to the requirements of the learners (Kasper, 1997). The same refers to the IMU. The Language, Communication and Culture Department in the IMU offers EAP modules aligned to the IMU Learning Outcomes. Using teaching strategies that include student-centred learning, content-based learning, cooperative learning, authentic learning, self-directed learning and use of technology, students are guided to overcome linguistic difficulties and cope with core studies.

Content includes developing listening, speaking, reading and writing skills related to activities that include academic study and job-related tasks.

A large number of studies have been done to reveal the challenges facing Asian students who are studying in English-speaking countries. One study suggests including knowledge of nonverbal communication into English teaching so as to enable English learners to become fully competent as nonverbal communication is one of the prerequisites to acquire intercultural communicative competence (Shi & Fan, 2010). In the field of verbal communication, many studies reveal the insufficient language skills of students of Chinese background both in and out of academic fields (Berman & Cheng, 2001; Holmes, 2006; Tran, 2009). These language difficulties have negative impacts on their academic performance and participation in classroom activities. For example, according to Holmes’ study (2006), some students of Chinese background would not communicate with New Zealand local students until they had acquired so-called “linguistic competence”. In addition, Berman and Chen (2001) argue that language difficulties in speaking and writing may have a negative effect on students’ academic achievement.

Students’ expectations in the academic environment are given due attention as well; one of the criteria to gauge academic performance is clarity in communication. Studies have revealed that students perceive lecturers with poor English proficiency skills as being less competent teachers (Jensen *et al.*, 2013). Measures have been taken in the IMU through the Human Resource (HR) Department to screen new recruits for English language competency and to offer courses to improve English language skills for both academic and corporate staff.

11.3.2 Role of the Humanities in Health Professions Education

Medical ethics and the Humanities teaching provides students and medical officers with a fund of knowledge and skills of reasoning, discernment, and judgment essential to sustainable professionalism in medicine. Medical ethics and the Humanities build skill sets in visual observation, textual reading and interpretation, oral reasoning and writing (Doukas *et al.*, 2012).

Ethics teaches learners to manage ethical dimensions of patient care responsibly while literature teaches attention to narratives as learners reconstruct patient stories into medical histories that are necessary for accurate diagnosis and effective clinical management. The discipline of art teaches intense, detailed and comprehensive observation. The discipline of history provides historical context that can help prevent a naive view of progress that blinds learners to the limits of medicine. In their own ways, each of these disciplines promotes empathetic relationships with patients, which enhances compassion in medicine (Doukas *et al.*, 2012). All these disciplines reinstate the importance of understanding the human condition and, therefore, are important for moulding 'caring' healthcare professionals.

Professional socialisation entails gradual assimilation of the values and attitudes of the medical profession (Prince *et al.*, 2005). The need to display accepted forms of professional conduct becomes much more urgent when students enter the clinical phase. The challenges students face when they enter clerkships are not simply the application of knowledge and skills but also adjustment to a clinical culture, the assumption of new levels of responsibility, the shift to experiential and more self-directed learning processes and the continual process of adapting to new people, places, content and expectations (O'Brien *et al.*, 2007). This factor becomes more pronounced when there is an additional

dimension of cultural variations as happens when students transfer to partner schools overseas. Ting-Toomey (2012) defines three methods in which culture restricts effective cross-cultural understanding, namely, cognitive constraints, behaviour constraints and emotional constraints.

Over the past few decades, many medical schools have incorporated 'Medical Humanities' as either part of their core curriculum or an elective module. Humanities education may play an important role in cultivating or maintaining empathy during medical training (Schwartz *et al.*, 2009). In Europe, Medical Humanities in healthcare education was found to facilitate the development of empathy, interpretative capacity, understanding and self-care, as well as an ethical sense and responsibility (Fieschi *et al.*, 2013). Studying the Humanities may provide much needed opportunities for self-reflection about the intensive process of becoming a physician and may ease feelings of isolation or burnout (Shapiro & Rucker, 2003).

Medical educationists discovered that the study of the Humanities, whether in the form of literature, history or spiritual studies, enables graduates to appreciate the diverse cultural backgrounds of their patients or clients. Students, in turn, relish the opportunity to reflect on the social and cultural nuances of medical practice and their personal values as developing physicians (Andre *et al.*, 2003). Realising the benefits of imbibing values from the Humanities in the medical school curricula, the IMU's Language, Communication and Culture Department has designed elective modules for second-year students in the Medical and Dentistry programmes, which were rated as an exceptional learning experience by students (DMani, 2008). The Department has since increased the integration of the Humanities by offering a variety of elective modules to first-year students in the Medical and Dentistry programmes, ranging from 'Learning from the Arts' and 'Art and Healing' to 'New Perspective Through Theatre'.

Apart from the formal curriculum, values from the Humanities may be imparted through student extra-curricular activities. Involvement in a student society enhances the social integration of students, and may even reduce attrition rates (Gallagher & Gilmore, 2013). The IMU has long been supportive of the sharing of ideas, interests and concerns among student groups, and recognises the need to provide an all-important complementary learning experience outside the classroom. The establishment of student-driven clubs and societies aims to develop skills, knowledge and attitudes pertaining to ethics, communication, management and aesthetics among students (Student Services Department, 2011). Students are expected to play an active role in the Humanities and societal issues, which would mould them into critical healthcare professionals in sync with the complexities of human relationships. In 2011, as part of the initiative to inculcate core values in the university, the IMU Aflame Student Award was created. The aim of the award is to highlight the crucial role of humane practices among students of healthcare schools. As such, the prospective awardee should exemplify a caring, compassionate, and collaborative learner who will serve as a positive reinforcement to prospective healthcare providers for the need to have such desirable qualities in patient and client care.

In addition to the above, the IMU strives also to be an engaged university by participating in community activities through the IMU Cares programme. Students from almost all the programmes in the IMU actively participate in such community activities with much enthusiasm and interest. In 2013, IMU won the Talloires Network MacJannet Prize 2013 for the Kg Tekir project for their extraordinary initiatives and service. There are a number of other IMU Cares projects which run throughout the year with the support of different Schools and Departments in the IMU. Interestingly, a large number of students participate in such community activities. Students learn to interact, empathise and appreciate cultural differences through these activities.

One of the IMU Aspire strategies is to advance humane values among staff to nurture a caring culture. A healthy workplace refers to an environment that promotes psychological, social, physical and organisational conditions that foster employees' health (WHO, 2010). These include promoting work-life balance; workplace culture; resources for personal health; involvement in the community to further enhance employees' and family members, as well as the health of the community; a healthy physical environment and others. A healthy workplace that has such components as clear organisational strategies and good human relations embedded in the organisational framework has been shown to decrease the experience of mental distress in relation to work (WHO, 2010; Rout, 2000). Beneficial organisational policies and strategies that contribute to reducing mental distress at work have the capacity of decreasing the rate of absenteeism and turnover among employees and increasing their productivity and work satisfaction (Mosadeghrad *et al.*, 2011; Cyboran & Goldsmith, 2012).

The "I Love Working at IMU" initiative by the HR Department to improve staff relations is steered by a committee responsible for organising festive celebrations and work and social benefit talks to nurture a caring environment. Apart from this, the IMU Centre for Education (ICE) and the E-Learning Department has created awards to recognise outstanding staff for contributions to their initiatives to improve quality of work as well as staff relations. In an effort to promote awareness of the interface between the arts and health as well as to promote a culture of values, an annual Festival of the Arts is also organised by academic and corporate staff.

In line with the IMU's mission and vision statement, adopting English as the language for all communication plays a key role in enabling the IMU to become one of the foremost global healthcare universities and a leading

research centre by overcoming local and regional language barriers. The integration of the Humanities into the health education curriculum also enables the delivery of values-based healthcare and nurtures the development of broad education aimed to prepare competent, ethical, caring and inquiring graduates and thereby uphold the vision of IMU among all its faculty and students.

11.4 Profiling the English Proficiency Level of Students

11.4.1 Entry Requirements

Applicants are required to fulfil a minimum standard of English by passing the Malaysian University English Test (MUET), the International English Language Testing System (IELTS) or the Test of English as a Foreign Language (TOEFL) prior to enrolling in the IMU. Students without these requirements are given the option to sit the Password English Test* as a supplementary English proficiency qualification. Do we need to include twinning programme? students are expected to achieve a higher level of English language competency compared to students enrolled in the local programme. This ensures that only students who are fairly competent in oral and written communication skills are selected as English is the principal medium of instruction in these universities. Refer to Table 11.1 for the current English Proficiency levels recommended for the various programmes in the IMU.

The percentage of students meeting the English Proficiency over the past five years is given in Figure 11.1. The current result is 97%. This is mostly due to the reduced English Proficiency requirement for Pharmacy and Health Sciences from IELTS Band 6.5 or MUET Band 4 to IELTS 5.5 or MUET Band 3 or Password 5.5 (effective January 2012).

Table 11.1 English Proficiency Requirement for All Programmes

Medicine and Dentistry	Overall IELTS Band of 7.0 for overseas option and 6.5 for local option (up till August 2013) Overall IELTS Band of 7.0 (with 7.0 in each individual band) for overseas option and 6.5 for local option (effective Feb 2014)
Health Sciences, Pharmacy (local option)	Overall IELTS Band 5.5 or MUET Band 3 or Password 5.5
All Credit transfer options for Health Sciences and Pharmacy	Overall IELTS Band 7.0 (except for BP-UQ – IELTS Overall Band Score 7.0 (with 6.0 in each individual band)

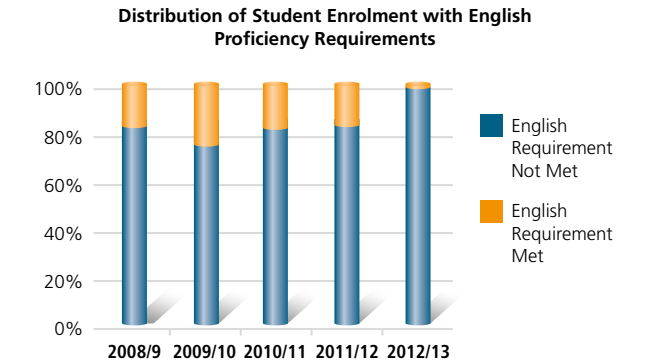


Figure 11.1: Distribution of Student Enrolment with English Proficiency Requirements

*From 2012, the IMU adopted the Password test as an English requirement into the IMU programmes. The test results of this online assessment are available immediately and it offers a direct comparison to IELTS via CEFR. (Common European Framework of Reference for Languages: Learning, Teaching, Assessment, abbreviated as CEFR, is a guideline used to describe achievements of learners of foreign languages across Europe).

11.4.2 Assessment of English Proficiency in Programmes

The Language, Communication and Culture Department is tasked to support and monitor the English proficiency of students. The Department offers compulsory English Language modules that have been embedded into the courses, focussing on English for academic studies.

Students enrolled in the Pharmacy programmes and Health Sciences programmes (Biomedical Sciences, Medical Biotechnology, Pharmaceutical Chemistry, Dietetics with Nutrition, Nutrition, Psychology, Chiropractic and Chinese Medicine) are required to take a compulsory English module. Pharmacy students must take the writing module, Academic Writing, in Semester 2 while Health Sciences students are required to take the content specific language module, English for Health Sciences in Semester 1. The passing score for these modules is 50 marks.

Academic Writing is a student-driven module that requires students to produce two essays, complete several online tasks and sit a Final Test at the end of the module during which they will write a synthesis essay in the time allotted. Students meet their lecturers for six face-to-face sessions. For the rest of the module, students are expected to access the notes and complete the tasks uploaded on the e-learning portal as given in the schedule.

English for Health Sciences is an English for Specific Purpose module that focusses on enhancing students' ability to produce original language through writing and speaking tasks. Several listening and reading activities are included. Students attend class every week and complete different writing and speaking tasks, compiled in a portfolio. At the end of the module they sit a final test that tests them on reading, comprehension, vocabulary and writing.

Students in the Medical programme are supported through a programme that monitors the English proficiency level of students and is assessed through written assignments and formative oral activities conducted in the core programme. Students' use of English for academic tasks in the programme, both written and oral, is assessed by the medical and language faculty. Students who are identified for support are offered 30 hours of oral and written remediation.

Semester 1 Medical students are required to write assignments for the Personal & Professional Development (PPD) Workshop, Clinical Visit and Assisted Independent Reading (AIR). The written assignments for the workshop and visit require a reflective format and the AIR, a synthesis. The students also participate in Problem-based Learning (PBL) discussions, conduct an interview with simulated patients and attempt the Formative Objective Structured Clinical Examination (OSCE).



For both the Academic Writing and English for Health Sciences modules, the IMU raw scores are used. For the Medical programmes, the IMU English level is used as a measure to assess student proficiency. In this study, the raw scores were calibrated to the English levels. The level of achievement of students in each programme corresponds to the learning outcomes of the module offered to the said programme. Students' level of English achievement in individual programmes should not be used as a basis to compare between programmes (Table 11.2). Descriptions of the English levels are shown in Appendix 11.1.

Table 11.2 Comparison between the IMU English Level and the IMU Scores

IMU ENG LEVEL	IMU RAW SCORES	IMU GRADE
4 (Expert User)	80-100	A
3.5 (Very Good User)	70-79	B+/A-
3 (Good User)	60-69	B-/B
2.5 (Competent User)	50-59	C/C+
2 (Moderate User)	40-49	D+/C-
1.5 (Limited User)	35-39	D
1 (Extremely Limited User)	<35	F

11.4.2.1 Pharmacy Programmes

Table 10.3 shows the scores obtained for the English Proficiency Level for the two Pharmacy Programmes. In 2011, B.Pharmacy students achieved an average score of 2.8 and this increased slightly in 2012 to 2.9 while the M. Pharmacy students in 2012 improved tremendously with an average score of 3.3 compared to 2.8 in the previous year.

Table 11.3 Bachelor of Pharmacy and Master of Pharmacy English Proficiency Level, Cohorts 2011 and 2012

Programme	B.Pharmacy		M.Pharmacy	
Cohort	BP1/11	BP1/12	MPQ1/11	MPQ1/12
N	164	187	49	73
Minimum	2.0	2.5	2.0	2.5
Maximum	4.0	3.5	3.5	4.0
Mean	2.8	2.9	2.8	3.3
Mode	2.5	3.0	2.5	3.5
Std Deviation	0.5	0.3	0.4	0.4

11.4.2.2 Health Sciences Programmes

Overall, the average proficiency level of Health Sciences students in 2011 and 2012 ranged mainly from a score of 3.3 to a score of 3.1 as seen in Table 11.4.

Table 11.4 Health Sciences English Proficiency Level, Cohorts 2011 and 2012

Programme	Health Sciences	
Cohort	1/11	1/12
N	182	240
Minimum	2.5	2.5
Maximum	4.0	4.0
Mean	3.3	3.1
Mode	3.5	3.0
Std Deviation	0.3	0.3

11.4.2.3 Medical Programme

The three assignments that gauged oral and written English proficiency are scored on a scale of 1 to 4. The passing score for the data reported below is 3. As reflected in Table 11.5, for the 2011 cohort, the average score for the oral proficiency level obtained was 2.9. In the subsequent year, the cohort ME1/12 achieved a similar average score. This improved by 0.2 for the following cohort ME2/12.

For the three written assignments, the first cohort for 2012, cohort ME1/12, achieved an average score of 2.6 while the second cohort for that year, cohort ME2/12, obtained an average score of 2.8.

Table 11.5 ME2/11, ME1/12 and ME2/12 Oral and Written English Proficiency Levels

Skill	Oral			Written	
	Cohort	ME2/11	ME1/12	ME2/12	ME1/12
N		248	233	245	233
Minimum		1.7	1.7	2.0	1.3
Maximum		4.0	4.0	4.0	3.7
Mean		2.9	2.9	3.1	2.6
Mode		3.0	3.0	3.0	2.7
Std Deviation		0.4	0.5	0.4	0.6

The overall proficiency in English of students in the Bachelor of Pharmacy programme for 2011 and 2012 is given as 'competent user'. The overall proficiency in English of students in the Master of Pharmacy programme for the years 2011 and 2012 is given as 'competent user'. The overall proficiency in English of students in the Health Sciences programmes for 2011 and 2012 is given as 'good user'. The overall proficiency in oral English of students in the Medical programme for 2011 and 2012 is given as being within the range of 'competent user' to 'good user'. The overall proficiency in written English of Medical students in 2012 is given as 'competent user'. These readings are reflected in Table 11.6.

Table 11.6 Summary of Proficiency in English of the IMU Students 2011 and 2012

Programmes and Cohorts	2011	2012
Bachelor of Pharmacy	Competent User	Competent User
Master of Pharmacy	Competent User	Very Good User
Medical	Oral: Competent User to Good User Written: Competent User	Oral: Competent User to Good User Written: Competent User

With the introduction of compulsory Language and Humanities modules effective October 2013, all students will be monitored closely to ensure the proficiency level is maintained if not advanced. Stricter regulations for examinations have also been imposed, requiring students to have 75% attendance and to pass in-course assessments before being allowed to sit the final examination. Students who fail the final examination will be deemed overall fail. These regulations have been enforced to ensure students take accountability in monitoring their progress and continue to be self-directed learners.

It will be compulsory for Medical and Dentistry students to elect modules focusing on advanced English and Humanities including Literature, Theatre, Art, Media and Communication. These modules aim to advance skills in the art of communication. Students will also co-organise the Humanities Day to present and perform activities that will boost self-confidence and strengthen communication skills.

11.4.3 Student Attitude Towards the Use of English

A survey was conducted among the IMU students to assess their attitudes towards the use of English. The students were surveyed for their perceptions of the importance of English as the medium of communication for:

- their studies in the IMU
- their future work as healthcare professionals
- employment in Malaysia
- employment overseas

A total of 541 students participated in the survey, which was carried out online through the IMU portal. Of the number of respondents, 68.6% were female while 31.4% were male students. The largest group of respondents were Year One students (29.6%), while the lowest (3.7%) were from Year 5. Results of the different responses between gender, year of study and programme did not yield any significant relationship. As such, the general descriptive data are reported. While this may not be strictly

representative, it does provide useful insights. It must also be noted that it is not unusual, that Year One students are more responsive, as such, the data may reflect what younger, more recent students'z feel. See Appendix 2 for the complete data.

The students were asked to respond on a Likert scale of 1 to 4 (1=Strongly disagree; 4=Strongly agree) as shown in Figure 11.2. The majority of the students (82%) accept English as an important global language while 3.3% strongly disagree. About 77% of the students strongly agree that English is an important language for study while 3.5% strongly oppose this view. On the necessity to have good English in order to excel in study, 88.8% agree; however, 11.2% disagree that English is needed for academic success. About 95.3% of the students agree that English is important for employment and 91.2% agree that it is necessary to have good English to secure a respectable job. More specifically, 90.6% agree that English is important for healthcare services.

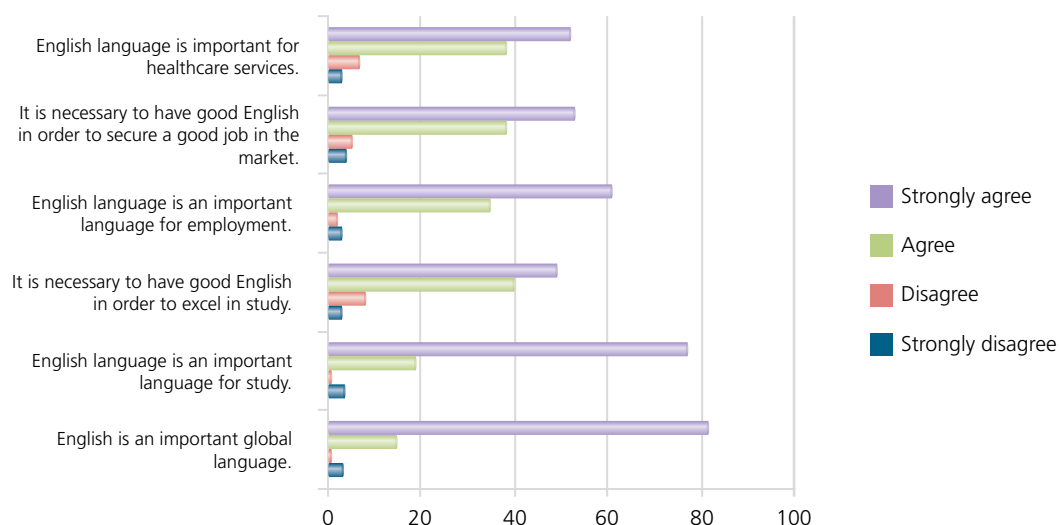


Figure 11.2 Student Attitude Towards English

The students were also asked to respond on a scale of 1 to 4 (1=Least important; 4=Most important) to the importance of the four language skills for their future work as a healthcare provider, as shown in Figure 11.3. The language skills specified were Listening, Speaking, Reading and Writing. About 83% of the respondents believe that Listening is the most important skill in healthcare services while 1.7% view it as least important. About 70% of the respondents deemed Speaking skills as being the most important for healthcare work while 1.9% report it as least important. Only 47.2% of the students rate Reading as most important while 2.5% believe Reading is least important. The final skill, writing, has 42.9% respondents who view it as most important while 4.9% believe it is the least important skill of all.

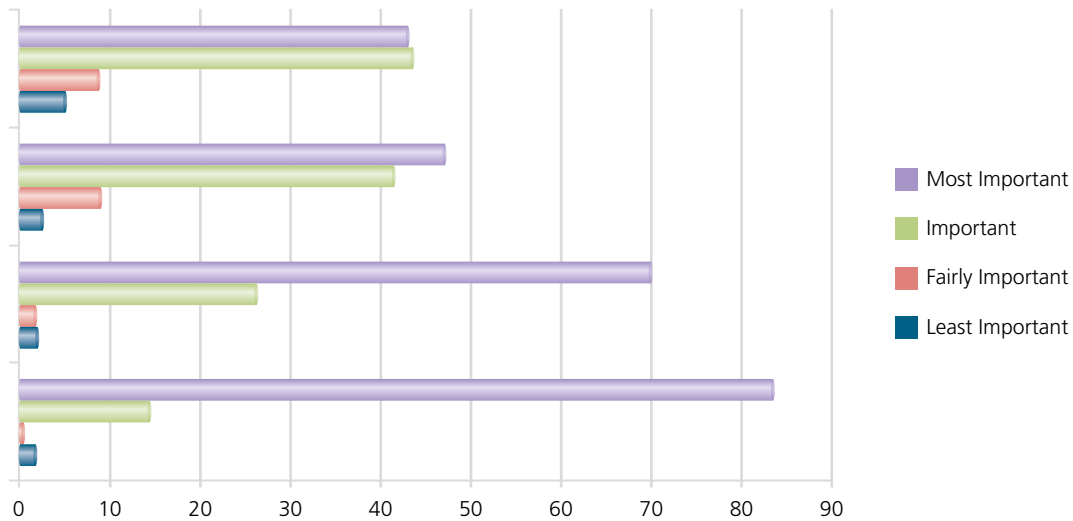


Figure 11.3 Importance of Language skills for Healthcare Services

The respondents were asked to rate the level of English they believed was necessary for employment in Malaysia and overseas based on the following scale: High / Good / Moderate / Low as given in Figure 11.4. Overall, an average of 52.6% respondents believe that the level of fluency in English in all four language skills needed for employment in Malaysia is “Good”. Not surprisingly, an average of 83.4% rate the need as “High” for employment overseas.

Of all four skills needed for work in Malaysia, only 34.2% believe they require a high proficiency level of Listening skills; likewise, a high proficiency level for Speaking received 31.8%, Reading 20.4% and Writing 21.8% respectively. As expected, respondents feel that working overseas requires a high proficiency level of 89.1% for both Listening and Speaking, followed by Writing at 77.7% and Reading at 76.6%.

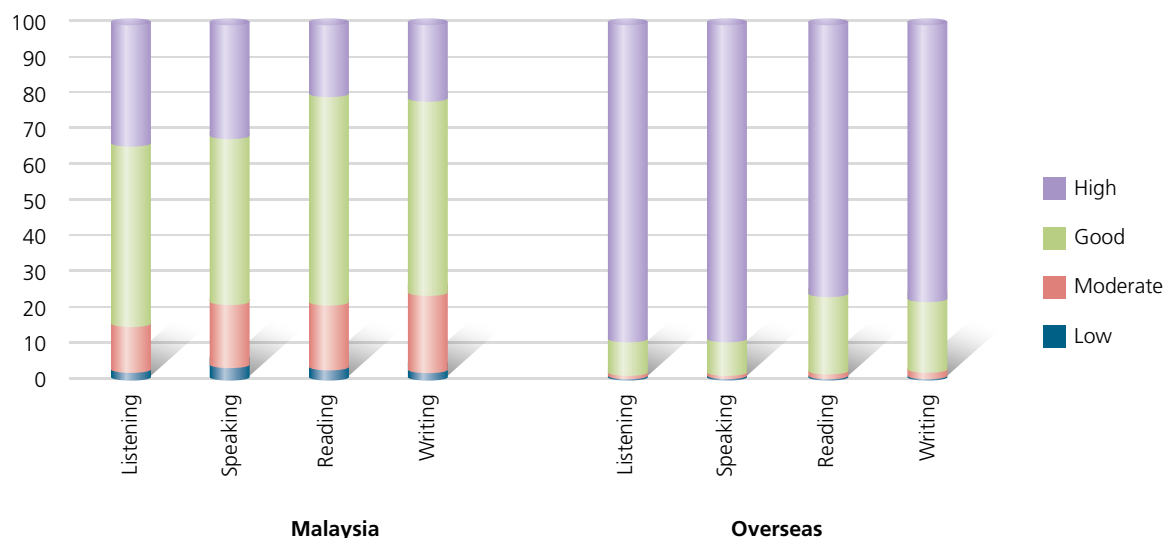


Figure 11.4 Level of English Needed for Employment in Malaysia and Overseas

11.5 Attitude of Staff Towards English

A survey was also conducted among 154 IMU staff (51.9 % from the academic faculty, 40.3% from the corporate division and 7.8% from academic support service) to evaluate their perception of the importance of English as a functional language, their proficiency in English and the role of the organisation in improving it. This breakdown reflects the actual distribution of academic and corporate staff.

All agreed that English is important as a medium of communication in the IMU. Staff need to use it at the workplace as faculty comprises of nearly 50 different nationalities. Not surprisingly, 88% use English for socialising.

Nearly 95% state that English is important for them to function more effectively in their work. The respondents have divided opinions about the support received from the organisation to improve English proficiency among

employees. About two-thirds of staff feel that the organisation has been supportive in their efforts to improve their proficiency in English.

11.6 The Practice of the Humanities

11.6.1 Perspective of Staff

An attempt was made to gauge how caring the staff views IMU as an employer. To gather this information, an Employee Satisfaction Survey (ESS) was conducted by the IMU HR Department in 2010. The results of the survey indicated that employees rated reward and recognition, work-life balance and work environment as areas that needed improvement.

Following the survey, several key areas were enhanced at the IMU. These include rewards and recognition resulting in new employee benefits such as a medical card for the convenience of staff; training and development

opportunities; compensation reviews; and achievement awards for employees. In work-life balance, staff trips and sport and recreational activities were introduced. To add to the improvement in these key areas, the HR Department now conducts a session known as 'IMU Engages' (previously called 'Townhall Meeting') during which management provides updates to employees on the company's performance.

Improvement in these areas shows that the IMU cares about employer-employee relationships. The continuous effort towards improvement has led to better employee satisfaction as recorded in the Employee Satisfaction Survey conducted in 2012. The improvements up to date are in line with IMU Aspire Plan which took effect in 2011 and continues until 2015. The Aspire Plan includes creating a favourable and conducive work environment for employees as it is essential for increasing employee morale. The IMU's aspiration towards promoting a healthy work environment indicates an organisation that highly regards good values at work as this motivates employees to be more enthusiastic and focussed in aiding the organisation to achieve its strategic goals.

In line with the above changes made at the IMU, an online survey was conducted to investigate if staff are aware of the good values (e.g. caring) being imparted within the IMU. The survey also sought to identify if these good values impacted the staff work activities and interaction within the IMU. A total of 282 IMU employees participated in the survey, of whom 54% were academics, 39% corporate staff, and 7% support service. Employees were asked if they were aware of the 'caring culture' in the IMU. A total of 67.7% of corporate staff note that they are aware of the 'caring culture' in comparison to 61.3% of academic staff and 44.4% of support service staff who note the same, as given in Figure 11.5.

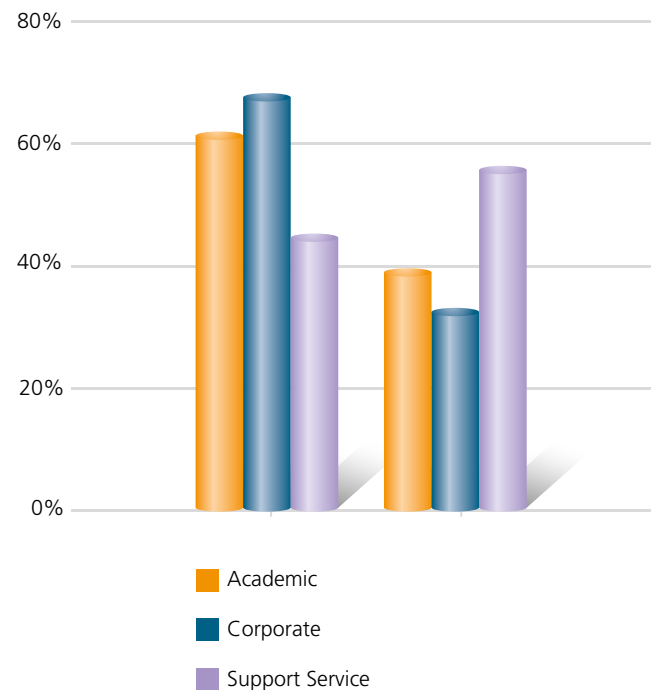


Figure 11.5 Participants' Awareness (%) of the Caring Culture Nurtured in the IMU

The respondents who answered that they were aware of the caring culture being nurtured in the IMU completed two more questions to reveal the impact of this caring culture in their treatment of people in the organisation. A total of 77.8% of support service staff answered that they were sensitised towards caring for their colleagues, followed by 77% of corporate staff and 70.1% of academic staff. The second area was care for students and to this, a total of 77.6% of academic staff revealed that they are more aware as a result of the caring culture instilled in the IMU, followed by 77% of corporate staff and 55.6% of support service staff, as given in Table 11.7.

Table 11.7: Has the Caring Culture Made Employees More Caring Towards Colleagues and Students?

Questions	Academic staff	Corporate staff	Support service staff
1. Has the caring culture made the employees more caring towards their colleagues?	70.1%	77%	77.8%
2. Has the caring culture made the employees more caring towards their students?	77.6%	77%	55.6%

The participants were also asked to select areas in which the ‘caring culture’ has caused them to be more conscientious in providing quality service. Among the academic staff, 82.5% chose teaching, 41.7% chose corporate activities and the remaining 54.4% chose the IMU Cares projects. Meanwhile, among corporate staff, 82.7% chose corporate activities, 49.3% chose the IMU Cares projects and the remaining 13.3% chose teaching. Among support service staff, 50% chose corporate activities and the remaining 50% chose the IMU Cares projects, as shown in Figure 11.6.

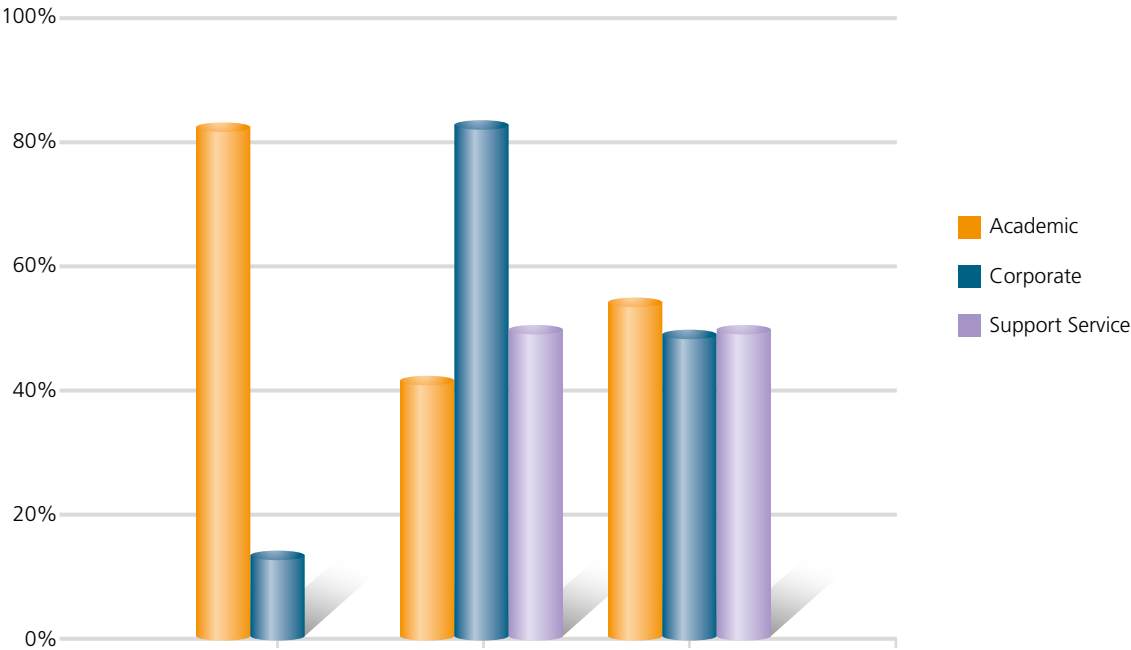


Figure 11.6 Areas in Which Employees Are Conscientious of Improving Quality

In summary, although staff are aware of the caring culture, the choice of transferring care is prioritised to familiar areas of contact.

11.6.2 Perspective of Students

The IMU has 48 clubs and societies registered with the Student Services Department (SSD) as of 13 August 2013 (information from the SSD). These associations are further classified into Cultural, Social and Sports Clubs. A simple study by the SSD revealed that only about 30% of the student population are members of a club or society, with an even smaller proportion of active members.

In line with the perceived benefits of extra-curricular activities, an online survey was conducted in October 2013 to gauge the extent of student engagement in clubs and societies and if they recognise the positive values that may be imparted through these social activities. There were 286 respondents altogether, with almost 70% consisting of female students. Around 43% of respondents were in the second year of their undergraduate programme, with a large proportion (44.5%) from the Medical programme. Again, this may not be representative; however the information gathered may be deliberated.

Forty-four per cent of the respondents admitted that they did not participate in any club or society in the IMU for various reasons. The most popular justification for their reluctance to participate (72%) is credited to the lack of time due to a packed curriculum, as shown in Figure 11.7. Other reasons, apart from the selections provided, were the odd timing of extra-curricular activities (after class hours); staying a distance away from the university; and the need to travel to the Clinical School in Seremban, which is relatively less active in the organisation of extra-curricular activities compared to the Bukit Jalil campus.

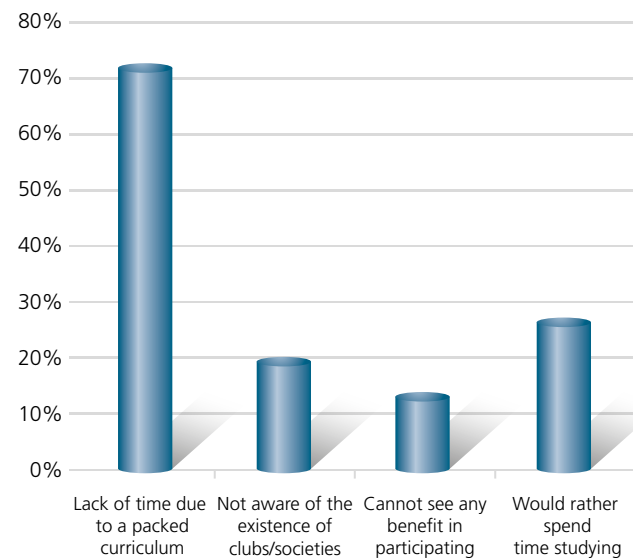


Figure 11.7: Reasons Indicated by Students Resulting in Lack of Enrolment in an IMU Club or Society

On the other end of the scale, about 7% of students remarked that they were members of more than three clubs or societies, and 71% of the respondents were members of at least one society while 13% held the post of president or chairperson. Many, if not all of them, have participated in or organised social activities; prominent among these activities are community service and charity bazaar/fundraising events (48.3% and 52.7%, respectively).

A 4-Likert scale online questionnaire was used to evaluate the students' perception of the Humanities and social activities with the answer options being Strongly Disagree, Disagree, Agree and Strongly Agree rated from '1' to '4' respectively. The survey revealed that students generally believe that the Humanities are an important aspect of university education (3.47) and the positive values they promote can be effectively imparted through social activities (3.31), as shown in Figure 11.8. Respondents

were also aware that the values learnt through these activities would enhance their capacity to become better healthcare providers (3.23). The students agree, although with less conviction, that their sense of empathy may be evoked through such activities (2.89). They also appreciate cultural differences better as a result of participating in these activities and find that they have more freedom of expression during social activities compared to in class. They were generally in agreement that social activities promote creative and critical thinking (3.33). When respondents were asked of the values they hoped to gain from participating in clubs and societies, many of them emphasised on personal qualities – leadership, communication skills, teamwork and empathy, among others. They also sought to learn or strengthen life skills such as critical thinking and organising skills.

In addition to the above survey on the IMU Clubs and Societies, two surveys were conducted: one to find out the perceptions and attitudes of students towards the Humanities in community visits and another to find out the perceptions of residents of disabled homes towards the students of the IMU who visited them. The surveys were distributed only to students who had recently participated in a community visit. A total of 125 students responded from various programmes in the IMU. The respondents were mainly from the School of Pharmacy followed by the Schools of Medicine and Dentistry. For the second survey, forms were distributed in two of the homes for the disabled elderly where the IMU Cares activities had been recently conducted.

A 5-Likert scale questionnaire was used for the first survey. The majority of the students believe that the Humanities play a major role in improving their attitudes towards and perceptions of the community to whom they provide healthcare service. However, students rated their enthusiasm for participation in such community

activities as the lowest. In the second survey a modified Jefferson scale of patient perceptions of physician empathy was used with a 7-Likert scale. The survey revealed that the IMU students were perceived to be empathic in showing concern to the residents of the disabled homes. But the IMU students were rated low when it came to specifically understanding the emotions, feelings and concerns of the residents (Refer to Appendix 11.3 for graphs).

In summary, the respondents of the questionnaire, whether they were active in clubs and societies or otherwise, showed a clear understanding of the values that may be imparted from organising or participating in social activities. They recognise the need to be well-versed in various soft skills, which is a crucial feature of a competent graduate in the healthcare sector. Lack of a conducive environment to boost student participation in extra-curricular activities is of concern. As for transference of skills to the society, it was observed by many coordinators that senior students in the IMU are more enthusiastic in participating in community activities compared to their juniors. Although students value participation in community service they may not be adequately trained to transfer the necessary skills which the community values.

At the time of print, Deans and programme coordinators are discussing the feasibility of designating a fixed slot in the weekly academic timetable for extra-curricular activities. With the introduction of 'Mata Pelajaran Umum' (General Studies) compulsory modules in 2013, which include the U4 'Soft/Life Skills in Higher Education' module, students are expected to be more pro-active in joining clubs and societies to fulfil the required credits.

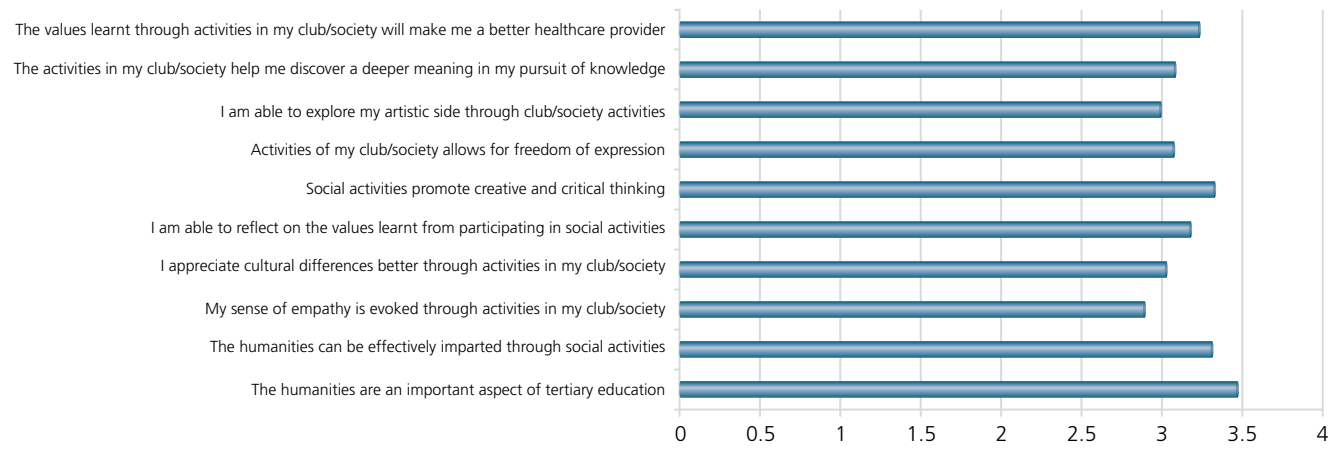


Figure 11.8 Student Perceptions of Values in the Humanities from Student Social Activities

11.7 Conclusion

The entry requirement for English proficiency varies in all programmes. It has in fact been reduced in some programmes which require a monitoring process of the students’ capabilities in keeping up with the set standards. A study on the overall proficiency in English of students in the year 2011-2012 was done to show the competency level of students. It revealed that students ranged between competent to good users. The level of proficiency matches the academic needs of individual programmes dictated by the competency required for the said programme. At present, English is offered for academic purposes and runs in one semester of each programme, as total credit hours in the programme restrict continuous monitoring and support. As such, programmes may also need to consider incorporating the use of English and assessment of English in core modules and if need be, to offer specialised English modules that prepare students for the workplace.

A survey was conducted to examine students’ attitude towards English. The majority of the students perceived

English as an important global language that will help them with their studies and secure good jobs. Although they believed that all four language skills were important for their future career in healthcare services, listening skill was rated as the most important followed by speaking, while reading and writing were deemed less important. Having a skewed view towards language whereby listening and speaking skills are considered vital while little emphasis is given to reading and writing is a cause for concern. The level of fluency in all skills is also seen as crucial for employment overseas. However it is not strongly perceived as imperative for the Malaysian workplace. This reveals students’ myopic view of the relevance of the English language in that they seek to advance in the language for the sake of integrativeness i.e. to identify with the community that they will work in rather than for motivational reasons that influence goal-directed behaviour including aspirations, enjoyment and success in achieving language-learning goals.

Employees working in the IMU are aware of and fully understand the importance of the English language as

the main medium for communication among staff in either academic or non-academic divisions. English is also perceived as a functional language as it helps improve productivity and efficiency of staff at the workplace. Nevertheless, about one third of employees believe that the organisation should play a bigger role in helping staff to improve their English proficiency. The IMU is international in outlook with partners from all over the world. Therefore, using a globally understood language is vital at all levels.

The majority of the IMU employees understand the existence of a 'caring culture' in the IMU. Academics are aware of the vital role they play in the classroom as role-models in showing care towards students but this needs to be practised outside the classroom as well. Likewise, the corporate and support staff remain within their comfort areas in transmitting care. The response towards the IMU Cares projects is deemed secondary to these other options. Other initiatives organised by HR and student-led bodies too receive poor response. A comprehensive awareness programme needs to be conducted to address this component for better transmission of values between management and employees; between employees; and between employees and the IMU customers i.e. students.

It is also observed that the IMU students display traits of the Humanities during community visits. They also understand that the Humanities have to be an integral part of their education in moulding them into better persons in delivering quality healthcare. However, intrinsic motivation to be engaged in these activities needs to be addressed. Students may feel pressured to be involved in these activities for the sake of meeting grades rather than for altruistic values that rightfully should be the value that needs to be imbibed as a healthcare provider.

11.8 Recommendations

11.8.1 Short-Term Plans

Based on information obtained, immediate plans are to be structured on the following:

1. The institution needs to commit and adhere to its principle of enrolling students with good proficiency in English via stricter student selection criteria. Essay writing, reading, and article appraisal sections should be considered during interviews.
2. Increasing awareness on use of English as an effective tool for communication especially in areas like leadership and internationalism
 - Encourage students' to lead in the IMU activities ie Open Day, Public Health Talks, CPDs, etc.
 - Encourage student's involvement in the organisation of the IMU activities as supervised by the Student Services Department.
 - Create more opportunities for students involvement in international educational or scientific conferences, student's seminars, etc.
 - Increase the opportunities for student mobility. More places for student exchange programmes should be created.
3. All Schools to review their curriculum to integrate methods to increase English proficiency among staff and students with additional focus on presentations skills and special focus on reading and writing skills
 - Increase teaching-learning activities which develop presentation skills and which also work towards building confidence and leadership
 - Writing assignments in core modules should give some weightage to English proficiency.

- Journal club for students to encourage reading of articles, appraising and criticising should be conducted for all programmes.

- To consider incorporating the Occupational English Test (OET) for healthcare professionals in the final semester to prepare students for the workplace. The test can be made applicable for students who seek to register and practise in an English-speaking environment.
- English short courses for oral, listening and writing skills should be offered to the IMU employees. Certificates can be offered on completion of courses. This will enhance the morale of staff to utilise English as the main medium for communication.
- Programmes with packed curriculum need to be revised to allocate some time for student's personal and professional development. It can either be integrated throughout the programme or a special module is developed focussing on instilling the values of empathy, caring and compassion.
- All Schools to review their curriculum to integrate methods to increase Humanities education among staff and students in and outside the classroom by incorporating electives with special focus on service to the community e.g. placement for volunteer work in nursing homes, homes for the disabled, prisons for immigrants, homes for single mothers, Doctors Without Borders, Befrienders, Mercy Mission etc.
- Incorporating values-based practice into all programmes. Awareness needs to be created and the process of learning can be incorporated into the curriculum. The significance is: staff and students will have the opportunity to internalise their own values that include cultural and religious beliefs into problem solving and decision-making. It also creates awareness on respecting societal values in communication or management contexts.
- Students and staff should be encouraged to be directly involved in missions to provide aid during disasters. A body should be made responsible to handle these activities where safety is insured and time out is provided for participants.
- The IMU Cares Projects should be handled and proposed by students to enhance their participation in leadership roles and provide a platform for teamwork among them; supervision and support can be given by staff.
- Community projects by students and staff can be extended beyond providing health screening or health education talks; projects to fix or build homes or provide clean water for the needy, for instance, will enhance the values of responsiveness, selflessness and teamwork.
- Institutionalise the Festival of the Arts and other arts-related activities within the university that promote staff and student interaction and participation; select one month in the year as 'Creative month' and work through Schools and Departments to encourage creativity and good values.
- The Aflame Student Award Committee to actively promote the award and consider extending the award to recognise team contribution for annual events organised by students via clubs and societies.

11.8.2 Five-Year Strategic Planning

1. Explore and identify the level of communication acceptable on a functional basis (individual, team and organisation).
 - Provide special modules or programmes as needed
2. Standard competencies in English set at levels suitable for each individual or team
3. Standard competencies set at levels suitable for each individual or team in the conduct of the IMU Cares projects and involvement in any Clubs and Societies.
 - Clubs or Societies should be encouraged to outline programmes focussing in Humanities which will benefit as many staff and students on an annual basis.

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11.10 Appendices

Appendix 11.1

Table 11.1A: Description of Levels (Adapted from IELTS)

4 Expert User	Has fully operational command of the language: appropriate, accurate and fluent with complete understanding.
3.5 Very Good User	Has fully operational command of the language with only occasional unsystematic inaccuracies and inappropriacies. Misunderstandings may occur in unfamiliar situations. Handles complex detailed argumentation well.
3 Good User	Has operational command of the language, though with occasional inaccuracies, inappropriacies and misunderstandings in some situations. Generally handles complex language well and understands detailed reasoning.
2.5 Competent User	Has generally effective command of the language despite some inaccuracies, inappropriacies and misunderstandings. Can use and understand fairly complex language, particularly in familiar situations.
2 Modest User	Has partial command of the language, coping with overall meaning in most situations, though is likely to make many mistakes. Should be able to handle basic communication in own field.
1.5 Limited User	Basic competence is limited to familiar situations. Has frequent problems in understanding and expression. Is not able to use complex language.
1 Extremely Limited User	Conveys and understands only general meaning in very familiar situations. Frequent breakdowns in communication occur.

Appendix 11.2

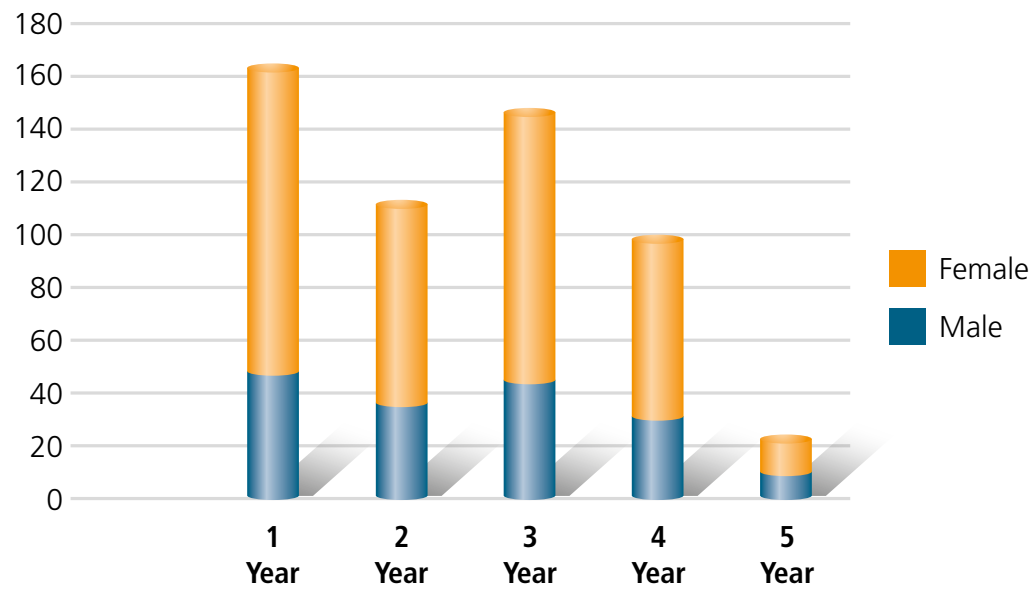


Figure 11.1A Respondents by Gender and Year of Study

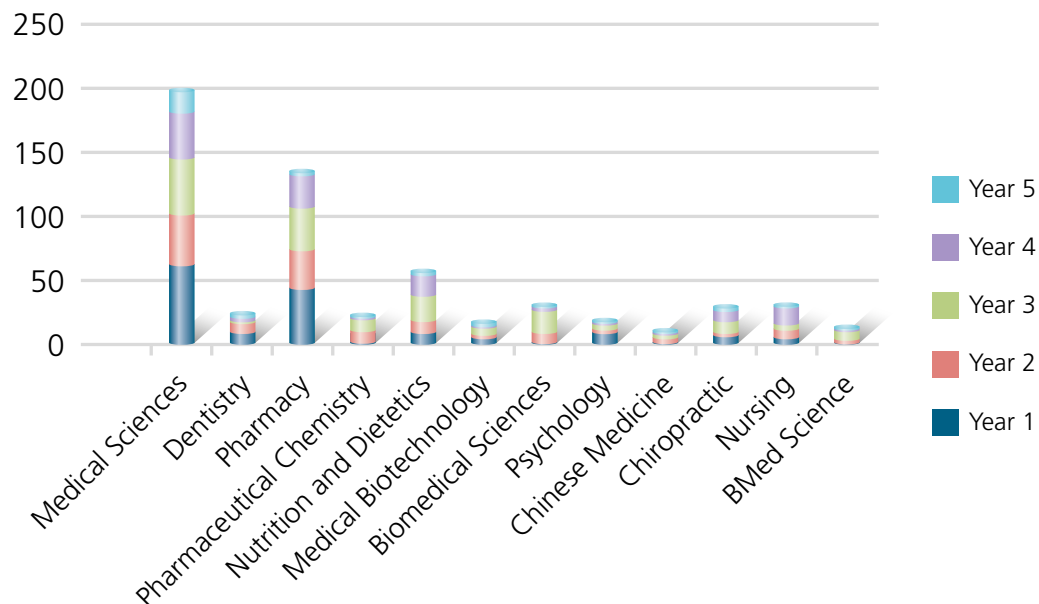


Figure 11.1B Respondents by Programme and Year of Study

Appendix 11.3

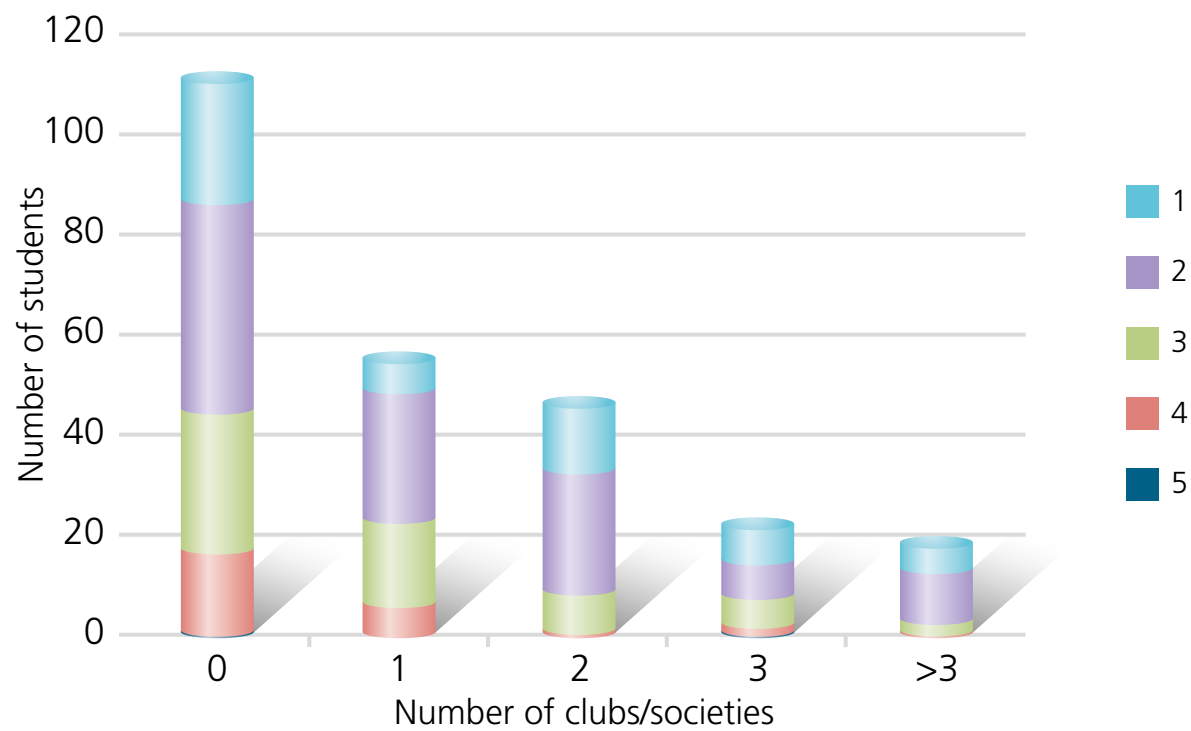


Figure 11.1C Number of clubs/societies participated in by year

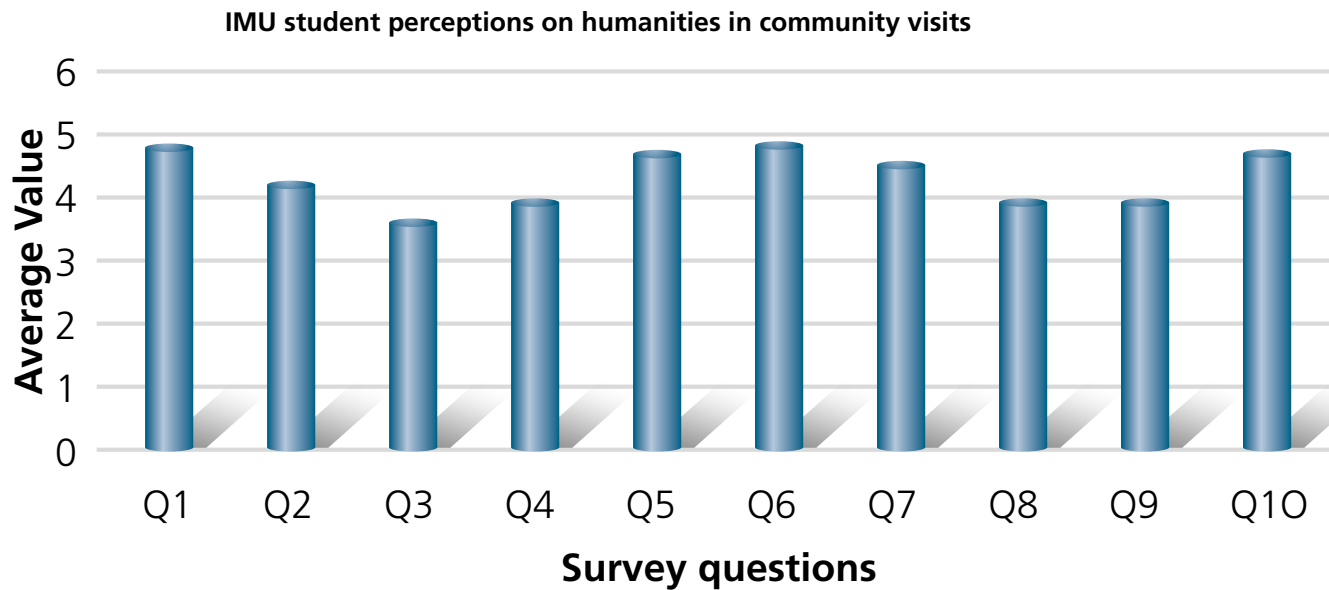


Figure 11.1D Student Perception of Humanities in Community Visits

KEY:

- Q1. I understand and appreciate the impact and importance of the humanities as I progress in my career.
- Q2. I believe that the Humanities play a major role in shaping my perception of members of the community.
- Q3. I am always motivated to participate in community visit activities.
- Q4. My ability to understand and interpret human values has increased through community visit activities.
- Q5. I have learnt through community interaction to always put myself in others’ shoes before I make a judgement.
- Q6. The community visits have enhanced my demonstration of empathy.
- Q7. I have learned about cultural and ethnic differences through the community visits.
- Q8. The community activities have influenced me in becoming sensitive to others’ sufferings.
- Q9. I have learned through community activities to view things in a holistic manner before arriving at a crucial decision.
- Q10. I believe my communication, social interaction and leadership skills have been enhanced through community visits.

SCALE: 1-Strongly disagree; 2-Disagree; 3-Not sure; 4-Agree; 5-Strongly agree

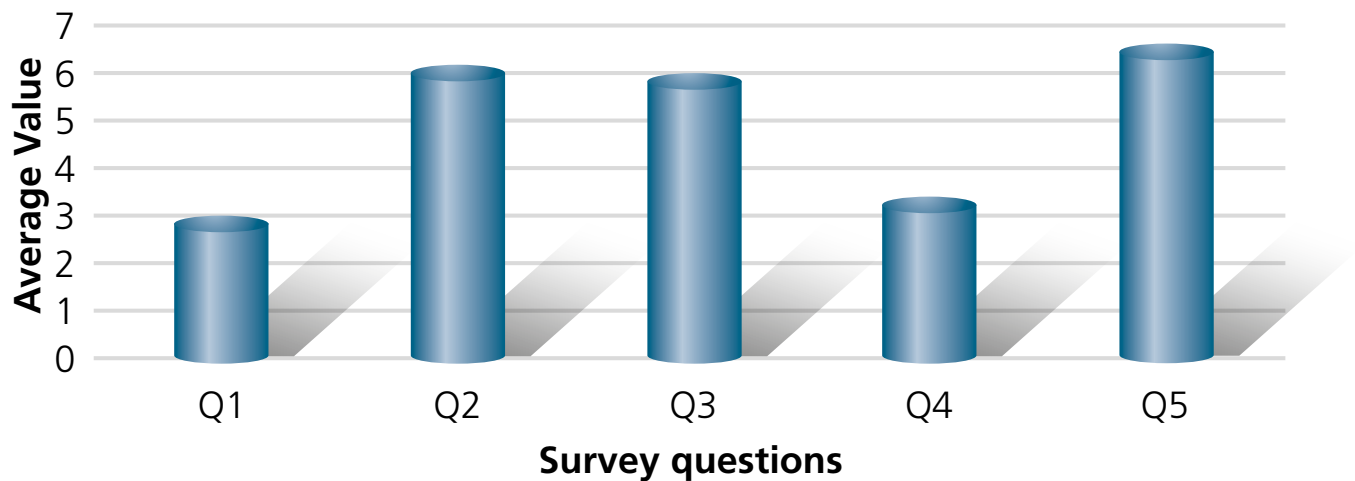


Figure 11.1E Modified Jefferson Scale of Patient Perceptions of Physician Empathy

SOURCE: Hojat M, Gonnella JS, Maxwell L: *The Jefferson Scales of Empathy (JSE): Professional Manual & User's Guide*. December 2009 Edition. Philadelphia, Pennsylvania: Jefferson Medical College – Center for Research in Medical Education and Health Care; 2009.

KEY:

- Q1. IMU students can view things from my perspective (see things as I see them).
- Q2. IMU students ask about what is happening in my daily life.
- Q3. IMU students seem concerned about me and my family
- Q4. IMU students understand my emotions, feelings and concerns.
- Q5. IMU students are understanding doctors.

SCALE: 1-Strongly disagree; 2-Disagree; 3-Not sure; 4-Neutral; 5-Might agree; 6-Agree; 7-Strongly agree

1

INTERNATIONALISATION AT THE IMU

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The IMU Experiment



12.1 Background

The International Medical University (“IMU”) embarked on an exercise in April 2013 to capture IMU’s practices in the key areas. The main objectives of this exercise are to:

1. Document the status of the given topic along with IMU’s current practices and future plans
2. Identify gaps and provide recommendations for IMU Strategic Plan 2011 - 2015. The following are the list of topics for this exercise:
 - a. IMU Vision & Mission
 - b. IMU Value System, Culture and Philosophy
 - c. Bioethics and Professionalism for Stakeholders
 - d. IMU Educational Philosophy and Learning Model
 - e. E-learning Framework for the Future
 - f. Academia and Scholarship in the IMU
 - g. Developing a Leadership Framework for the IMU
 - h. **Internationalisation at the IMU**
 - i. English and the Humanities in IMU
 - j. Virtual Hospital

12.2 Scope

In general, this document deliberates the role of internationalisation, primarily in the area of health, healthcare, research and education. The paper also aims to provide insight for local and global future outlook through critical evaluation of IMU’s current role and practice. To meet the needs and expectations of health professionals working in the healthcare system of the future, the team has listed the recommendations for IMU’s future development. Please take note that this is not an authoritative paper but a ‘living document’ that needs to be updated and adapted over time when it is applied.

12.3 Introduction

Internationalisation has been the integral part of higher education institutions in the developed countries since the mid-1990s. Ever since then, this model had been slowly adopted into the education systems of other regions, including the emerging economies.

12.3.1 Definition

One of the most commonly used definitions for internationalisation of higher education was initially elaborated and subsequently adapted by Jane Knight and Hans de Wit. In its most recent iteration, the definition reads as follows: “the process of integrating an international, intercultural and/or global dimension into the goals, functions (teaching/learning, research, services) and delivery of higher education” (Knight, 2005).

Internationalisation of higher education refers to institutional arrangements set up by governments, universities and education agents that involved the delivery of higher education services in two or more countries” (Kritz, 2006). In the 1960s and 1970s, governments, international organisations and private foundations in Asia, South America and Africa started scholarship programmes to support students studying overseas as a means of building human capacity. Hence, the phenomenon of students travelling to other countries to obtain higher education has been going on for many decades, and they continue to do so in increasing numbers today.

The term international emphasises the notion of nation and refers to the relationship between and among different nations and countries. Internationalisation refers to the awareness, understanding and acceptance on cultural aspects within and between systems of teaching, research and other service functions in a Higher Education Institution

(Yang, 2002), integrating an international, intercultural or global dimension into the purpose, functions or delivery of post-secondary education (Knight, 2004).

Internationalisation as defined by Knight clearly is a process. It reflects a set of activities or strategies that institutions formulate in order to respond to increasing globalisation. Globalisation and internationalisation are used interchangeably in various contexts (Yang, 2002a). However, both constituted very different concepts, as summarised in the Table 12.1.

Table 12.1 Primary Values of Globalisation and Internationalisation (Yang, 2002a)

	Globalisation	Internationalisation
Origin	Started in the 19th century or earlier with the rise of Western imperialism and modernisation, nowadays fuelled by modern technology	Dating back at least to the Sophists and Confucius, respectively in Ancient Greece and China
Impetus	Profit and belief in a single, worldwide market	Advancement of human knowledge based on realisation of the bond of humanity
First priority	Economic	Human interests
Primary form	Competition, exploitation, and the survival of the fittest	Cooperation, collaboration, caring, sharing and altruism
Benefits	One-sided economic benefits	Mutual advantages
Mobility of educational provision	South -> North (students) North -> South (programmes)	Two / multi-way
Quality regulation	Largely ungoverned	Careful quality control

12.3.2 Concept

The ability to research, disseminate and apply new ideas is the core requirement in the business of private higher education institutions. Increasingly, the business of universities is as much across as it is within borders, and not just in the free flow of ideas but in the global flow of students and scholars who generate them.

An international university must now be characterised by its engagement with the processes of globalisation, its international networks and its internationalised curriculum. Internationalisation simply means the assimilation of practices or processes of an activity in one nation with those from other parts of the world. This process may

perhaps be a method towards an individual's, organisation's or a country's goal achievement.

The concept of internationalisation of higher education seems to cover a wide range of methods and approaches. Although the approaches of internationalisation appeared in multiple forms (Zha, 2003; Irene, 2003; Knight, 2004; Ayoubi & Massoud, 2007) and varied across authors, most studies have reflected the term internationalisation using almost similar key words or phrases. Internationalisation is the process of integrating international and intercultural dimensions into the teaching, research and service of an institution (Knight 1997).

Critical review of reports on internationalisation programmes in higher education (HE) (e.g. Kwok et al., 1994; Salehi-Sangari and Foster, 1999; Haigh, 2002) has led to the identification of four main thematic areas of internationalisation. These are: faculty, students, curriculum content and international alliances. Hale and Tijnstra (1990) proposed a model for the internationalisation of management education and it can be seen in Table 12.2 (Hale and Tijnstra, 1990).

Internationalisation of higher education models developed by Zha (2003), Knight (2004), Ayoubi & Massoud (2007) and Horn et al., (2007) had contributed wide knowledge to many scholars as well as recommendations to further extend the existing frameworks and methodologies to be applicable in an emerging market context. Internationalisation is relevant to all facets of university life, including teaching and learning, research and development and institutional management. Leask (1999) viewed staff development as one of the most important factors in internationalisation.

Table 12.2 Model for Internationalisation of Management Education (Hale and Tijnstra, 1990)

General Area	Hale and Tijnstra’s Aspects
Faculty	<ul style="list-style-type: none">• Exchanging faculty members• Undertaking joint research, consultancy, and publication with colleagues abroad
Students	<ul style="list-style-type: none">• Exchanging students• Setting up double degree programmes• Setting up fully integrated joint programme with foreign institutions
Curriculum Content	<ul style="list-style-type: none">• Internationalising courses in a wide range of disciplines• Adding international courses to the curriculum• Adding language courses to the curriculum• Offering work or study assignments abroad for students
International Alliances	<ul style="list-style-type: none">• Exchanging faculty members• Exchanging students• Setting up double degree programmes• Setting up fully integrated joint programmes with foreign institutions

12.4. Current Trends and Future Outlook

12.4.1 Global

One noticeable shift in the landscape of 21st century healthcare is the growing awareness of disease prevention. This is a stark contrast to the conventional emphasis on acute healthcare. To stay in line with this development, IMU should position itself as the leading centre for global wellness, catering for the needs of more preventive

healthcare services on lifestyle and environmental therapies. Additionally, taking advantage of the geographical location, IMU can further enhance its strength in niche areas such as tropical medicine. These transformations are timely, seeing the recent influx of patients from the western countries into this region, and the higher demand for high quality and affordable healthcare services.

On the other hand, the demand for places in higher education will continue to spiral globally, based on data

from the United Nations. In the non-OECD countries, it is estimated that student enrolment will expand substantially from 69 to 255 million by 2025 among those aged 20 - 24 years. The expected rise in the OECD countries is more modest from 46 to 51 million over a similar period.



A small number of countries continue to be the main recipients of international students namely, United States, United Kingdom, Germany, France and Australia (Kritz, 2006). Among them, United States continues to be the top choice for foreign students especially from China, attracting a notable 23% increase in 2011 – 2012.

It is estimated that there are over 2 million international students worldwide. These comprise (i) foreign students studying on a university home campus, and (ii) foreign students studying for the university degrees on an off-shore campus, or by distance-learning. Concomitant with rising income and demands for higher education, universities both public and private alike have become international players in the market place competing for students.

Changes in the landscape of international student enrolment is occurring globally, albeit gradually, and this is the shift in the direction of student flows. Students who went overseas for higher education used to be mainly from countries in the South, with top destination being the countries in North America or Western Europe. The trend today showed significant international student movement from the south-to-south, and in fact flows in all directions are growing rapidly.

Another evolvement in the internationalisation of tertiary education scene is the increasing participation of developing countries in foreign student recruitment. Countries that previously only sent students abroad have started to improve the quality of their own higher education, and slowly enhancing their policies and strategies to attract international students themselves (Becker & Kolster, 2012).

The continual advances in technology and communication have further impacted the globalisation of higher education in terms of the exchange of knowledge, ideas, people and values. United Kingdom and Australian universities have been aggressively reaching out to a wider market. One of the common practices is to set up an offshore campus to deliver the learning and teaching to the locals. Monash University justified such a strategy by “going local in a global world”.

Whilst the massive open online courses (MOOC) have gain enormous popularity in recent years, the impact to the current higher education business model is still unclear. MOOC helps to eliminate the barriers and provides accessibility for the masses to higher education. However, it is believed that the target segment is different as university trains for the future elite workforce of the industry.

Asia heads the list of regions sending students abroad for higher education (43%) of all international tertiary-level students in OECD countries. Europe is second (35%), followed by Africa (12%), North America (7%), South America (3%) and Oceania (1%). Looking at individual countries, China (including Hong Kong) sends the largest number of students abroad (10%) of all international students in the OECD area, followed by Korea (5%), India (4%), Greece (4%), and Japan (4%). More than two-thirds (70%) of all Asian students abroad study in three English-speaking destinations: the United States, the United Kingdom and Australia.

12.4.2 Malaysia

As for developing countries including Malaysia, the implication of internationalisation is evidenced in student and faculty composition, programme and curriculum mobility and the diversity of higher education providers (Ziguras, 2001; Mok, 2007; Morshidi and Kaur, 2007; Yonezawa, 2007; Akiba, 2008; Tham & Kam, 2009).

The Ministry of Higher Education Malaysia has embarked on various initiatives to elevate standards of higher education and establish Malaysia as a regional education hub. In Malaysia, transnational higher education is regulated by the Private Higher Educational Institutions Act 1996. A strategic framework was adopted in 2012 by the establishment of a knowledge and skill hub through internationalisation as a means towards global leadership. The National Higher Education Strategic Plan (PTPTN) gave emphasis to a comprehensive internationalisation effort capable of making Malaysia a regional education hub with 200,000 international students’ enrolment by 2020. (<http://postgraduate.my/the-internationalisation-of-malaysian-higher-education/>)

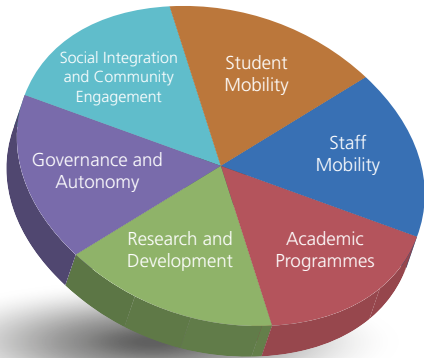


Figure 12.1 Six critical aspects of internationalisation for Malaysian higher education for 2011 – 2020 (Source: Internationalisation Policy for Higher Education Malaysia)

12.4.3 Internationalisation in IMU

IMU Demographics

Students

IMU has a total of 3,200 students currently enrolled in different programmes. The number of international students is 188 representing 33 different countries from Australia, Singapore, Maldives, Myanmar, Sri Lanka, India Mauritius, Pakistan, Bangladesh, New Zealand, Canada, Brunei, Gambia, Hong Kong, Indonesia, Taiwan, Thailand, Iran, Japan, Korea, Kenya, Nigeria, Philippines, South Africa, Libya, Sudan, Tanzania, Tunisia, Seychelles, Yemen, Zimbabwe, Uganda & Vietnam (Table 12.3).

Table 12.3 Key statistics of students enrolled in IMU

2013 (September)	
Malaysian	3012
International	188
Total	3200

Source: IMU Academic Services Department

Staff

IMU has a total of 570 staff of which 23% are expatriates from 19 countries (Figure 12.2). They are mainly from India, Pakistan, Myanmar, United States, Australia, and Sri Lanka.

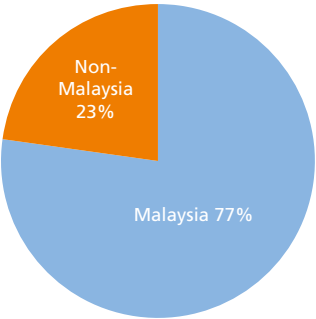
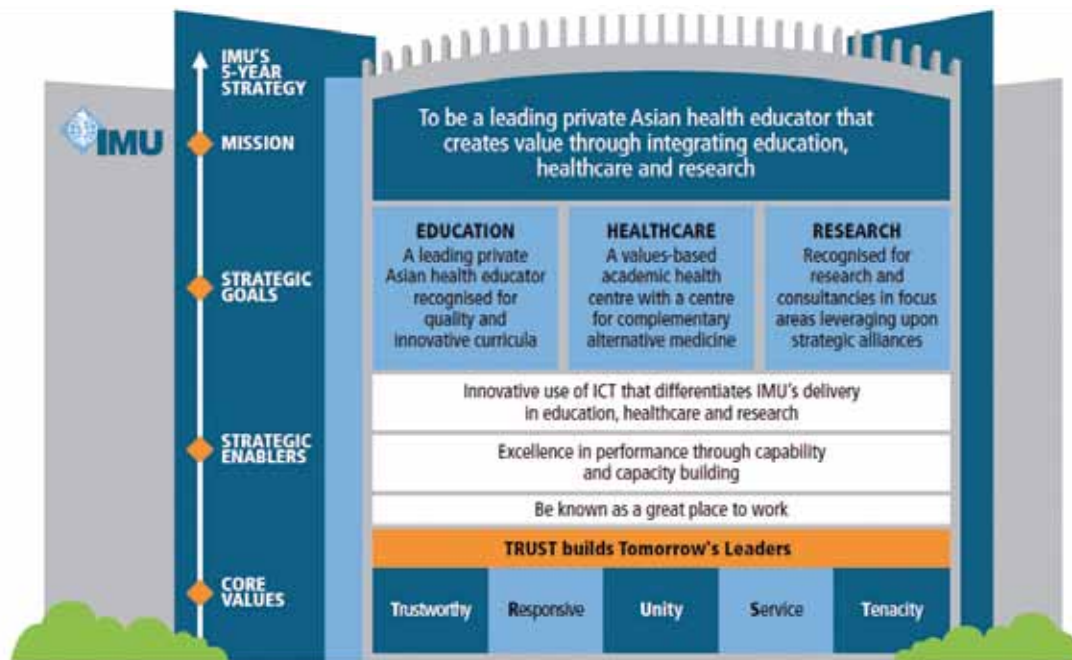


Figure 12.2 IMU Staff Workforce Demographic Profile 2013 (Source: IMU Human Resources Department)



IMU has yet to develop an internationalisation policy. The current strategy is framed within the context of the university's Vision and Strategic Plan 2010 - 2015. IMU has enhanced its reputation regionally and internationally, as a top-quality institution for teaching and research that provides:

- A curriculum and learning experiences that have produced graduates who are prepared to work in an international, multicultural and multilingual environment.
- A research environment producing research outputs of international quality, establishing strategic linkages in research and scholarship with universities and international research institutions of the highest standing.
- A dynamic and exciting work culture that attracts top-quality staff from around the world, which encourages international collaborations and exchanges

of staff in research and scholarship, and fosters in academic and professional staff a deep appreciation of internationalisation and its benefits to the IMU, Malaysia, the region and the world.

- Commitment to promote academic freedom, institutional autonomy, and social responsibility.
- Continuous assessment of the impacts, intended and unintended, positive and negative, of internationalisation activities on IMU.
- Engagement in opportunities to create international communities of research, learning, and practice to solve pressing global health problems, innovation and challenges in health professional education.
- A spirited and inclusive alumni network.

The **values-based** concept is getting more common in the healthcare industry, especially in the western countries. This is one of the important efforts to improve the health



outcome. The Boston Consulting Group (BCG) in United States has even set up a Centre for Health Care Value to look into the best practice of values-based healthcare. Under the IMU Strategic Plan 2011-2015, IMU has introduced its five core values (Trustworthy, Responsive, Unity, Service and Tenacity), ethics and professionalism. It has been a continuing effort since then for respective Schools to embed these values into the curriculum, as well as in learning and teaching delivery.

Benchmarking to International Standards

The IMU has always strived to benchmark its curriculum, learning and teaching delivery and services to the international standards. The IMU Academic Council (AC) which consists of the Deans or their representatives from the Partner Medical Schools and Partner Dental Schools together with all members of the IMU Senate meets

annually. It acts as a consultative body with regards to the medical and dental programme of the IMU, and makes recommendations on admissions, curriculum, assessment and faculty appointments and development. Besides, IMU established the Professional Education Advisory Committee (PEAC) to ensure that the IMU has effective, continuous processes in place to assure that its educational programmes are of the highest quality.



The IMU is reaping the harvest of all the effort and hard work. In 2013, the IMU was conferred two international awards, the Association for Medical Education in Europe (AMEE)'s ASPIRE for Excellence Award in the area of 'Student Engagement' and first place in the MacJannet Prize for Global Citizenship (community project).

Student and Staff Mobility Programme

The Student and Staff Mobility Programme is one of the key initiatives under IMU's Strategic Plan 2011 - 2015. This initiative aims to formalise and put in place a systematic structure for the mobility programme. This is in line with MOHE's Internationalisation Policy 2011 - 2020 whereby staff and student mobility are among the six critical aspects identified under this policy.

The Student Mobility Programme's main aim which is to increase the student's international exposure has received increasingly good response from students since its implementation in 2011. Singapore and Taiwan are among the popular countries for the outgoing IMU students. We have incoming students from the United Kingdom, Kazakhstan, Indonesia and Pakistan that participated and the programme has received good feedback.

Table 12.3 Key statistics of students enrolled in IMU

	2013 (September)
Malaysian	3,012
International	188
Total	3,200

Source: IMU Academic Services Department

Mobility needs to be better embedded in the internationalisation of education. It should be definitely assessed as to whether these added values are developed in the student and more innovative reflection is required on alternative ways of achieving these added values, for instance by the use of virtual mobility. One aspect of the higher education experience which has a particular effect on the overall international ambience of a programme of study is the teaching methods used. Using workshops, seminars, group projects and any of a range of activities in which students work together in small groups, enables students to learn from each other.

As for the staff mobility programme, one of the main objectives is to provide an opportunity for the staff to learn and benchmark against best practices in the areas of education and research development and leadership management.

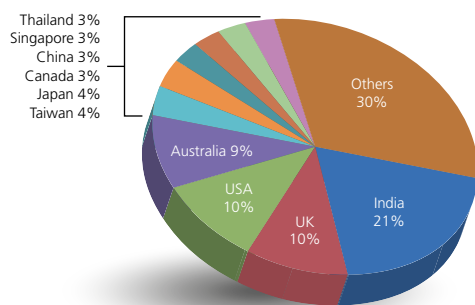
In 2002, Oxford Brookes University (OBU) published guidance for adding international dimensions to curricula, suggesting the following means of doing so (OBU, 2002):

1. Referring to international research.
2. Applying theory in an international context.
3. Using international material in case studies and other assignments.
4. Using small group discussions of international aspects.
5. Requiring the demonstration of international knowledge in assessments.
6. Encouraging foreign language study.
7. Promoting cultural sensitivity and diversity.
8. Recruiting international students and drawing on their experience in class.
9. International exchange.
10. Study abroad.
11. Offering international internships.

It is important to recognise that Higher Education Institutions (HEIs) seek to meet a dual challenge in internationalisation. Firstly 'to create a more 'internationalised' student from our own university' (Salehi-Sangari and Foster, 1999) and secondly, to meet the needs of international students who may be visitors on exchange, or enrolled for an award having chosen the UK as the supplier of their education.

Research and Conferences

As a leading private healthcare university in Malaysia, IMU conducts research in several areas of global interest. Four research centres of excellence, namely the environmental and population health, bioactive molecules and drug discovery, cancer and stem cell research, and health professional education research were set up under the IMU Institute for Research, Development and Innovation (IRDI).



IRDI scientists are actively engaged in international collaborative research. Approximately 40% of the publications are shared with at least one foreign co-author. The biggest collaborative partners are from India, United Kingdom, United States and Australia. (Details on Internationalisation can be found in Internationalisation of Research booklet developed by IRDI).

Since 2004, IMU Centre of Education (ICE) formally known as CtME (Centre of Medical Education) holds The International Medical Education Conference (IMEC) every year. This conference serves as a platform to exchange ideas and experiences, showcase innovations in health professional education. In 2011, IMU hosted the 6th Congress of the Asian Medical Education Association (AMEA) and in 2012, IMU hosted the 15th Ottawa Conference for the first time in Asia.

IMU Centre for Lifelong Learning (ICL) supports and facilitates education programmes of the highest quality to meet individual and institutional needs. The 1st International Conference for Bioethics and Professional Practice held in 2013 was organised by IMU in collaboration with the International Bioethics Committee, UNESCO while the Critical Thinking in Nursing Conference held in IMU was yet another highlight of 2013.

12.5 Recommendations

Competition for international students will intensify not only globally, but also regionally and nationally. Increasingly more countries are aiming to become international or regional hubs of higher education (e.g. Singapore, Malaysia and Thailand). The implications for the IMU are many fold with respect to raising its international competitiveness for foreign students.

With the economic and political balance of power shifting from Europe to Asia, international student mobility patterns are beginning to change in this direction as well. Hence, it is imperative that the IMU strategises its quality brand and international prestige towards influencing increasing student flows from established and emerging economies in the east, including China, Korea, Japan, Vietnam and Indonesia to the IMU.

The IMU should also position itself to attract more students from countries where English is not the medium of instruction at the school or pre-university levels, but who are interested to work in a global context. Studying in an English-speaking environment will equip these students to work in corporations and institutions with transnational operations. Towards this end, the international content of relevant programmes and modules in the IMU should be enhanced.

Another strategy to draw foreign students to the IMU is to link up with leading universities that encourage their students to participate in 'study abroad' programmes, or to pursue specific programmes with international contents. An example of the former is the Erasmus programme set up in 1987 in Europe which facilitates European nationals to spend 3 - 12 months of study in another European country. The IMU could draw on such experiences and provide specific short courses or modules that are tailored to meet global interests. Examples are modules for overseas medical students interested in tropical diseases and indigenous health. Some universities in emerging economies have set up programmes to train nationals and foreign students for a niche market in another country.

Global perspective has increasingly become an important graduate outcome. Some of the local higher education institutes has been actively using this as a key selling point to market their products. Malaysia, a country with its cultural diversity allows graduates to have better culture adaptability. This is especially important for healthcare professionals as they will potentially meet patients of various ethnics and backgrounds.

Internationalisation can be a means to prepare IMU graduates for life and work in a global market of services, products and ideas. However, besides producing global citizens who are capable of broad and effective civic engagement, internationalisation can seek to harness institutional research energies for a wide set of purposes in an increasingly borderless and interdependent world.

The IMU should review its offerings periodically to ensure that delivery of the programmes meets the industry and global needs and prepare students to be global healthcare professionals. Graduates should be prepared to sit and pass the professional exams in foreign (for local students) or their home countries (for international students).



Hence, the IMU's learning model should be in line with the latest trend of global health and healthcare services. The initiatives should include but are not limited to the following:

- Development of strategy and action plan to be incorporated into ICE strategy;
- Review of academic requirements or learning outcomes, based on ACE Mapping Internationalisation Report;
- Value diversity and internationalisation as integral to all programmes;
- Ensure that international perspectives are included in curriculum design and content;
- Use relevant international examples integral to learning activities;
- Construct culturally sensitive learning and teaching activities; and

- Internationalisation of the curriculum that aims to encourage staff and students to be critical, self-reflective practitioners.

Taking into consideration of the MOOC's current trend, it is recommended that the IMU keeps up-to-date of the latest developments of MOOC and follows closely on the latest learning management system (LMS) to incorporate it into IMU's learning and teaching well as its business model. It will help IMU to reach out to a wider market.

Research collaborations among universities from different participating countries have been successfully implemented for decades. Research collaborations, especially those supported by scholarships for international Masters and PhD students provide a clear-cut approach in increasing international student and faculty mobility.

In the National Budget 2014, the Malaysia government recognises the importance of establishing a world-class scholarly centre. Hence, the government has set up the Malaysian Citation Centre to increase publication of local scholarly works. The IMU should leverage on this platform to increase the number of academic and research publications in international and prestigious journals.

At the same time, IMU should periodically review its policy and guidelines to explore new approaches that will attract top healthcare educationists and scientists. Perhaps one of the initiatives is to develop and extend existing partnerships for joint appointments or joint institutes with international partners.

Besides the continuing effort of benchmarking to the international standards, the IMU should continue to increase its visibility and peer recognition, perhaps through participating in the world university rankings. One of the world university rankings, conducted by

QuacquarelliSymonds (QS) has categorisation by different fields and there is participation from both public and private universities. In QS 2013 for example, one of Taiwan's private universities, Taipei Medical University was ranked as being among the world's top 101 to 150 in the medical field.

The other great way to engage the international community is to attract more international conferences and events to the university that could showcase the IMU's strength in the area of healthcare education and research.

Whilst the IMU has a strong team in quality assurance of the curriculum and delivery, it is strongly suggested that the team continues its effort to ensure academic programmes are recognised by international accreditation bodies and professional bodies in other countries.

Last but not least, the University's culture is an important element to the success of internationalisation. Apart from values and diversity that were mentioned above, the IMU should further promote openness, autonomy and flexibility to cultivate the right culture.

In summary, the cross-border market for higher education is a multi-billion dollar industry, but it is also highly competitive (Kritz, 2006). While the IMU continues to formulate various strategies to reach a wider market, the university may face challenges and constraints to build sufficient capacity if this is not properly planned. To meet projected growing demands in the years ahead, it is recommended that the IMU's strategies be reviewed along with the vision and mission of the University as it has to be aligned. Thereafter, the IMU should strengthen its current mechanism to put structure and processes in place.



Educational Mission

As an educational institution, our mission is

- To further strengthen the IMU as a centre of excellence for undergraduate programmes in medicine, pharmacy and other health sciences programmes
- To establish the IMU as a centre for higher education providing training through multidisciplinary programmes
- To establish the IMU as a centre for postgraduate training and Continuing Professional Education
- To train knowledgeable and skillful professionals with high ethical standards who will be dedicated to serve and improve the quality of life of the community
- To train competent professionals with the use of innovative technologies of knowledge especially ICT in the teaching - learning process





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1

SIMULATION IN TEACHING- LEARNING OF HEALTHCARE PROFESSIONALS IN A VIRTUAL HOSPITAL SETTING

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The IMU Experiment



13.1 Introduction

The past three decades have seen a rapidly growing interest in using simulation for purposes of improving patient safety and patient care through a variety of applications. Those working on the development and use of simulation in healthcare seek to produce a model in which the structures and systems of healthcare are optimised for safety, quality and efficiency. Current systems of healthcare throughout the world do not accomplish this: the reports of the United States (US) Institute of Medicine on medical error and on “crossing the quality chasm” are good examples. The revolution that has been envisioned concerns education, training and maintaining of skills by health care personnel to provide safe clinical care. Current healthcare system places a premium on basic science education, and leaves most clinical training to a relatively unsystematic apprenticeship process. The emphasis is on individual knowledge and skill rather than on honing the performance of clinical teams.

Medical education has, during the past decade, witnessed a significant increase in the use of simulation technology for teaching and assessment. Contributing factors for this trend include: changes in healthcare delivery and academic environments that limit patient availability as educational opportunities; worldwide attention focused on the problem of medical errors and the need to improve patient safety; and the paradigm shift to outcomes-based education with its requirements for assessment and demonstration of competence. The use of simulators addresses many of these issues: they can be readily available at anytime and can reproduce a wide variety of clinical conditions on demand. In lieu of the customary (and arguably unethical) system, whereby novices carry out the practice required to master various techniques – including invasive procedures – on real patients, simulation-based education allow trainees or clinical teams to hone their skills in a risk-free environment.

Evaluators can also use simulators for reliable assessments of competence in multiple domains. (Scalese *et. al.* 2007)

Use of Information Technology has been the most important enabler: witness the widespread use of medical IT across the continuum of lifelong learning: medical students now view lectures online or via podcasts; residents consult resources stored in personal digital assistants (PDAs) to help make patient management decisions at the point of care; practitioners receive continuing education credits by attending teleconferences broadcast over the internet. (Scalese *et. al.* 2007)

13.2 Definition of Simulation

“Simulation” is a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion.

Gaba (2004) stresses that simulation should be interpreted as a strategy – not a technology – to mirror, anticipate, or amplify real situations with guided experiences in a fully interactive way.

Scalese *et al.* (2007) clarified aims of “medical simulations” as imitation of real patients, anatomic regions, or clinical tasks, and/or mirroring the real-life circumstances in which medical services are rendered. While “simulators” refers to particular simulation devices, which can take many forms and span the range from low to high fidelity, and from devices for individual users to simulations for groups of trainees. A convenient classification scheme groups these various simulators into 3 categories: part task trainers, computer-enhanced mannequins (CEM), and virtual reality simulators.

The interest in simulation for healthcare is derived in large measure from the long experience and heavy use of simulation for training and other purposes in non-medical industries. In particular, these include commercial aviation, nuclear power production, and the military industries that share with healthcare intrinsic hazards and complexity, but are considered high reliability organisations that have a very low failure rate considering their inherent risks. (Gaba DM, 2001).

Simulation-based training is a method or strategy of training that involves the use of several scientific, theory-based approaches to training, and includes information, demonstration, and practice-based methods. (Salas et. al., 2006) It is an approach to training that seeks to accelerate the development of expertise by systematically designing opportunities to practise that result in the desired learning (Salas and Rosen, 2008).

According to Salas *et al.* (2005) the key components of simulation-based training are as follows:

- performance history/skill inventory,
- tasks/competences,
- training objectives,
- events/exercises,
- measures/metrics,
- performance diagnosis, and
- feedback and debrief.

Simulation learning serves as a bridge between classroom learning and real-life clinical experience. Using simulation technologies in true-to-life medical settings, learners are free to build on their current knowledge base and develop important clinical skills before they work with real patients (Aukstakalnis *et. al.*, 2008).

In the current healthcare system, for most invasive procedures, novices at a task will typically first perform

the task on a real patient, albeit under some degree of supervision. They climb the learning curve, working on patients with varying levels of guidance. Simulation offers the possibility of having novices practise extensively before they begin to work on real patients as supervised “apprentices”. (Gaba, 2004)

13.3 Simulation-based Training

Simulation-based training provides opportunities for trainees to develop requisite competencies through practice in a simulated environment that is representative of actual operational conditions; trainees receive feedback related to specific events that occur during training (Oser et. al., 1999). The healthcare community can gain significantly from using simulation-based training to reduce errors and improve patient safety when it is designed and delivered appropriately (Salas et. al., 2005)

Following The Berry/Cooper (2006) simulation-based training is dependent upon the fact-based scenarios that are played out by a cast of real participants and artificial patients. Together, they provide an experience that helps physicians, nurses, and students:

- acquire the procedural skills of medicine without “practising” on patients and then allow the practice of those skills to maintain them;
- rehearse the rare events, the equivalent of an engine failure event for a pilot in the flight simulator;
- behave and communicate more effectively as part of a team, particularly in a crisis;
- safely try out new and sometimes dangerous ideas and equipment;
- record their learning experience with the benefit of replay and reflection; and
- assess their performance more objectively than is now done in a purely clinical environment.

In healthcare, simulation will be employed for those activities for which it is best suited, particularly for activities that are hazardous, involve uncommon or rare situations, or for which experiential learning is of great value. Finding the right mix of traditional learning, simulation based learning, and actual patient care experience is an important challenge (Gaba, 2004).

13.4 Does Simulation-based Education Work?

More than 600 studies enrolling over 36,500 participants have attempted to answer whether simulation-based education worked by comparing simulation-based training against no intervention. In these comparisons, both virtual patients and technology-enhanced simulation are consistently associated with large, statistically significant benefits in the areas of knowledge, skills (instructor ratings, computer scores, or minor complications in a test setting), and behaviours (similar to skills, but in the context of actual patient care) (Cook *et. al.*, 2010 and Cook *et. al.*, 2011). For direct patient effects (e.g., major complications, mortality, or length of stay), the benefits are smaller but still significant (Zendejas *et. al.*, 2013). Clearly, simulation-based education works - at least when compared with no instruction.

There are studies comparing different simulation-based approaches to explain what works, for whom, and in what context. To this end, a review of 289 studies of technology-enhanced simulation (enrolling nearly 20,000 participants) confirmed theory-based predictions that feedback, repetition, range of difficulty, cognitive interactivity, clinical variation, distributed practice, individualised training, and longer training time significantly improve skill outcomes (Cook, 2013). Similar analyses for patient-related outcomes (behaviors and patient effects) revealed benefits of similar direction and magnitude that approached but did not reach statistical significance.

Comparing with other modalities is challenging because every study uses a slightly different simulation intervention and a slightly different “other” approach. However, evidence from more than 100 studies and 7000 participants indicates that simulation is non-inferior to other approaches (Cook, 2012 and Cook, 2013). Technology-enhanced simulation is associated with a small but statistically significant benefit for outcomes of knowledge and skills, while for patient-related outcomes (behaviors and direct patient effects) the benefits approached but did not reach statistical significance (Cook, 2013). In summary, simulation-based education is as good as, but perhaps not substantially better than other approaches.

Although effectiveness is now well established, value judgments require consideration of costs—not only the price of the simulator (many of which cost upwards of USD\$75,000) but also faculty time, training expenses, facility fees, and opportunity costs (i.e. what else could trainees do with their time?). Very few studies have enumerated these costs, and none has offered a complete accounting (Zendejas *et. al.*, 2013) leaving us very much in the dark when it comes to judging the value of simulation-based education. However, one thing is clear - more expensive simulators are not necessarily better. Numerous examples illustrate that low-fidelity, low-cost training models can yield outcomes equal to much more expensive simulators (Norman *et. al.*, 2012).

13.5 Factors Influencing Use of Simulation-based Education

This shift to simulation-based training and assessment constitutes a significant departure from the traditional “see one, do one” approach and the customary reliance on real patients for education. In addition to developments in simulator technology per se, other factors have influenced this evolution. Changes in healthcare delivery (e.g.

outpatient management of many conditions for which inpatient treatment was previously indicated, higher acuity of illnesses and shorter hospital stays for patients who are admitted) have reduced patient availability as learning opportunities at academic medical centers; at the same time, resident work hour reforms and changes in staff compensation make it increasingly difficult for both trainees and clinical faculty to balance their service obligations with time for education and evaluation. Many simulators, by contrast, are ideally suited for independent learning and, thus, can save faculty time. Moreover, unlike real patients who are frequently “off the ward” when instructors and learners arrive to perform their assessments, simulators can be readily available at any time and can reproduce a wide variety of clinical conditions and situations on demand. This transforms curricular planning from an ad hoc process (dependent on finding real patients with specific conditions of interest) to a proactive scheme with great flexibility for educators. In addition, simulators do not become tired or embarrassed or behave unpredictably (as might real, especially ill, patients), and therefore they provide a standardised experience for all (Scalese *et al.* 2007).

Adopting these models in medical education, specialties such as anesthesiology, critical care, and emergency medicine have led the way in using simulation modalities, especially for teaching and testing the skills needed to manage rare and/or critical incidents. Examples of the effectiveness of such simulation-based training include the mastery of advanced cardiac life support skills by Internal Medicine residents, and a systematic literature review details other features and uses of high-fidelity medical simulations that lead to improved educational outcomes in multiple domains (Scalese *et al.*, 2007).

Closely related to these safety issues are important ethical questions about the appropriateness of “using” real (even standardised) patients as training or assessment

resources. Such debate often centers on instructional or evaluation settings that involve sensitive tasks (e.g., pelvic examination) or risk of harm to patients (e.g., endotracheal intubation). Use of patient substitutes, such as cadavers or animals, raises ethical concerns of its own and faces additional challenges (such as availability, cost, and maintaining an adequately realistic clinical environment). Use of simulators, conversely, circumvents most of these ethical obstacles: trainees can make mistakes and learn to recognise and correct them in the forgiving environment of the simulation, without fear of punishment or harm to real patients. At the same time, the educational experience becomes truly learner-centered, instead of focused on the patient, as is appropriate in actual clinical settings.

13.6 Simulation for Outcome-based Education

“While student learning is clearly the goal of education, there is a pressing need to provide evidence that learning or mastery actually occurs.” (Kochevar, 2004) This statement reflects a recent worldwide shift in focus toward outcomes-based education throughout the healthcare professions. This paradigm change derives in part from attempts by academic institutions and professional organisations to self-regulate and set quality benchmarks, but chiefly it represents a response to public demand for assurance that doctors are competent. Accordingly, medical schools, postgraduate training programmes, hospital and health system credentialing committees, and licensing and specialty boards are all placing greater emphasis on using simulation modalities for the evaluation of competence across multiple domains. Thus, beyond its scope for teaching and learning, simulation technology offers potential advantages in the realm of clinical assessment. The new outcomes-based educational paradigm serves as a suitable framework for considering the best applications of simulation technology for testing purposes. The Accreditation Council for Graduate Medical Education

(ACGME) in the US describes 6 domains of clinical competence: 1) patient care, 2) medical knowledge, 3) practice-based learning and improvement, 4) interpersonal and communication skills, 5) professionalism, and 6) systems-based practice. Evaluators may use simulations to assess various knowledge, skills, and attitudes within these domains (Scalese *et al.*, 2007).

Some examples: During a ward rotation for Internal Medicine residents, faculty can test aspects of trainees' patient care: using a cardiology patient simulator, demonstrate the ability to perform a focused cardiac examination and identify a fourth heart sound or a murmur. We can evaluate medical knowledge: using a full-body simulator during a simulated cardiac arrest, verbalise the correct steps in the algorithm for treatment of pulseless electrical activity. We can assess interpersonal and communication skills and professionalism: during a simulation integrating a simulated patient (SP) with a plastic mannequin arm, demonstrate how to draw blood cultures while explaining to the patient the indications for the procedure. This last example highlights the reality that actual clinical encounters often require practitioners to utilise their abilities in multiple domains simultaneously. Formal assessments have traditionally focused on isolated clinical skills, e.g. perform a procedure on a simulator at 1 station in an Objective Structured Clinical Examination (OSCE), obtain a history or deliver bad news with an SP at another station. More recently, very innovative work features evaluations more reflective of real clinical practice by combining simulation modalities—for instance, a trainee must interact (gather some history, obtain consent, explain the procedure) with a female SP, who is draped below the waist, while performing a bimanual exam on a pelvic simulator placed beneath the drape—for simultaneous assessment of both technical and communication skills (Scalese *et al.* 2007).

13.7 Simulation for Competency Assessment

Additionally, within any of the domains of competence, we can assess learners at 4 different levels, according to the pyramid model conceptualised by Miller. These levels are:

- A. knows (knowledge) – recall of basic facts, principles, and theories;
- B. knows how (applied knowledge) – ability to solve problems, make decisions, and describe procedures;
- C. shows how (performance) – demonstration of skills in a controlled setting; and
- D. does (action) – behaviour in real practice.

Various assessment methods are more or less well suited to evaluation at these different levels of competence; for example, written instruments, such as exams consisting of multiple choice questions, are efficient tools for assessing what a student “knows”. Conversely, it makes little sense (despite longstanding custom) to test the ability to perform a procedure by writing about it. Rather, for evaluation of those outcomes that require trainees to demonstrate or “show how” they are competent to perform various skills, the ACGME Toolbox of Assessment Methods 27 suggests that simulations are the most appropriate instruments. In the patient care domain, for example, the toolbox ranks simulations among “the most desirable” methods for assessing ability to perform medical procedures and “the next best method” for demonstrating how to develop and carry out patient management plans. Within the medical knowledge competency, examiners can devise simulations to judge trainees' investigatory/analytic thinking or knowledge/application of basic sciences. Simulations are “a potentially applicable method” to evaluate how practitioners analyse their own practice for needed improvements (practice-based learning and improvement) and, in the realm of professionalism, simulations are among the methods listed for assessing ethically sound

practice. One of the strengths of simulators for testing purposes is their generally high degree of reliability - because of their programming, simulators consistently present evaluation problems in the same manner for every examinee and minimise the variability inherent in actual clinical encounters. This reproducibility becomes especially important when high stakes decisions (e.g., certification and licensure) hinge on these assessments.

Use of simulators for such examinations is already occurring in several disciplines: for instance, the Royal College of Physicians and Surgeons of Canada is utilising computer-based and mannequin simulations in addition to SPs for their national Internal Medicine certification (oral) exams, and the American Board of Internal Medicine employs similar simulations in the Clinical Skills Module that is part of their Maintenance of Certification Programme. Numerous published studies offer evidence of validity (usually “face”, “construct”, or “content validity”) for various medical simulators, but whereas determination of these psychometric properties is important, research often has not addressed the perhaps more important question of “predictive validity” i.e. will performance on a given assessment predict future performance in actual practice? Only recently have there been reports of newer simulation devices for testing (e.g. virtual reality systems for minimally invasive surgery 29,30) related to these considerations that are fundamental to the competency based education model.

13.8 The Technology Applicable or Required for Simulations

To accomplish these goals a variety of technologies (including no technology) will be relevant for simulation. Verbal simulations (“what if” discussions) and standardised patient actors require no technology but can effectively evoke or recreate challenging clinical situations. Similarly

very low technology – even pieces of fruit or simple dolls – can stand in for skin and muscle for the initial training of some manual tasks. Certain aspects of even complex tasks and experiences can be recreated even with low tech means. For example, some education and training on teamwork can be accomplished with role playing, analysis of videos, or drills with simple mannequins. Ultimately though, learning and practising complex manual skills (for example, surgery, cardiac catheterisation), or practising the dynamic management of life threatening clinical situations that include risky or noxious interventions (such as intubation or defibrillation), can only be fully accomplished using either animals, which for reasons of both cost and issues of animal rights is becoming very difficult, or a technological means to recreate the patient and the clinical environment. Simulation technologies vary from relatively simple multimedia to different sorts of part-task trainers to simulators. A part-task trainer is a device that replicates limited aspects of a task, but does not present an integrated experience. A “patient simulator” is a system that presents a fully interactive patient and an appropriate clinical work environment in one of the following ways:

- In actual physical reality, using a patient mannequin (“a mannequin based simulator”).
- On a computer screen only (a “screen based simulator”).
- Using virtual reality (VR; a “virtual reality simulator”) by which parts or all of the patient and environment are presented to the user through two or three dimensional visual and audio representations, with or without touch (haptics) to create a more “immersive” experience. A screen based simulator can be viewed as a very limited VR simulator. In addition, VR devices that replicate particular procedures (for example, laparoscopic surgery) in a fully interactive fashion, and that use replicas of actual tools, are also referred to as simulators, even though they do not present the full patient.

13.9 Site of Simulation Participation

Some types of simulation—those that use videos, computer programmes, or the Web – can be conducted in the privacy of the learner’s home or office using their own personal computer. More advanced screen based simulators might need more powerful computer facilities available in the medical library. Part-task trainers and virtual reality simulators are best fielded in a dedicated skills laboratory. Mannequin based simulation can also be used in a skills laboratory, although the more complex recreations of actual clinical tasks require either a dedicated patient simulation centre with fully equipped replicas of clinical spaces, or the ability to bring the simulator into an actual work setting (in situ simulation). There are advantages and disadvantages to doing clinical simulations in situ versus in a dedicated centre. For example, using the actual site allows training of the entire unit with all its personnel, procedures, and equipment. On the other hand, there will at best be limited availability of actual clinical sites and the simulation activity may distract from real patient care work. The dedicated simulation centre is a more controlled and available environment, allowing more comprehensive recording of sessions, and imposing no distraction on real activities. For large scale simulations (such future vision of simulation as disaster drills) the entire organisation becomes the site of training.

Video conferencing and advanced networking may allow even advanced types of simulation to be conducted remotely (see dimension 10 below). For example, the collaborative use of virtual reality surgical simulators in real time has already been demonstrated, even with locations that are separated by thousands of miles.

13.10 The Extent of Direct Participation in Simulation

Most simulations, even screen based simulators or part-task trainers, were initially envisioned as highly interactive activities with significant direct “on site” hands-on participation. However, not all learning requires direct participation. For example, some learning can take place merely by viewing a simulation involving others, as one can readily imagine being in the shoes of the participants. A further step is to involve the remote viewers either in the simulation itself or in debriefings about what transpired. Several centres have been using video conferencing to conduct simulation based exercises, including morbidity and mortality conferences. Because the simulator can be paused, restarted, or otherwise controlled, the remote audience can readily obtain more information from the onsite participants, debate the proper course of action, and discuss with those in the simulator how best to proceed.

13.11 The Feedback Method Accompanying Simulation

Much as in real life, one can learn a great deal just from the experience itself, without any additional feedback. For most complex simulations, specific feedback is provided to maximise learning. For onscreen based simulators or virtual reality systems, the simulator itself can provide feedback about the participant’s actions or decisions, particularly for manual tasks where clear metrics of performance are readily delineated. More commonly, human instructors provide feedback for simulations. This can be as simple as having



the instructor review records of previous sessions that the learner has completed alone. For many target populations and applications an instructor provides real time guidance and feedback to participants while the simulation is going on. Here too, the ability to start, pause, and restart the simulation can be valuable. For the most complex uses of simulation, especially when training relatively experienced personnel, the typical form of feedback is a detailed post-simulation debriefing session, often using audio-video recordings of the scenario. Waiting until after the scenario is finished allows experienced personnel to apply their collective skills without interruption but then allows them to see and discuss the advantages and disadvantages of their behaviours, decisions, and actions.

Of the features and best practices in stimulation-based education, McGaghie (2010) highlighted the importance of debriefing in giving medical trainees feedback in the context of simulated-based education. According to the author, the following evidence-based practices described by Salas *et al.* (2008) for team debriefing for use after critical incidents or recurring clinical events can be adopted for simulation-based education:

1. Debriefs must be diagnostic.
2. Ensure that the organisation creates a supportive learning environment for debriefs.
3. Encourage team leaders and team members to be attentive of teamwork processes during performance episodes.
4. Educate team leaders on the art and science of leading team debriefs.
5. Ensure that team members feel comfortable during debriefs.
6. Focus on a few critical performance issues during the debriefing process.
7. Describe specific teamwork interactions and processes that were involved in the team's performance.

8. Support feedback with objective indicators of performance.
9. Provide outcome feedback later and less frequently than process feedback.
10. Provide both individual and team-oriented feedback, but know when each is most appropriate.
11. Shorten the delay between task performance and feedback as much as possible.
12. Record conclusions made and goals set during the debrief to facilitate feedback during future debriefs.

13.12 Cost

The cost of implementing various applications of simulation varies widely. Cost depends greatly on the mix of target population, purpose of simulation and technology used. Some forms of simulation are inexpensive and distributed (e.g. screen-based or web-based simulations and part-task trainers). Low cost is particularly important for early learners of tasks and skills, where routine availability and the possibility of repeated practice are most valuable.

Where simulation training replaces existing training (e.g. as a substitute for animal laboratories) its relative cost will also be relatively low. At the highest end – providing new training curricula to experienced clinical teams or work units, using high fidelity scenarios – the costs are likely to be substantial. Yet it is exactly for these applications that the greatest potential is seen for improving patient safety.

13.13 Benefits

The benefits derived from the various applications of simulation will be much harder to measure than the costs. Safety gains are intrinsically difficult to assess, whereas the magnitude of the investments made are starkly apparent (Gabam, 2001). Some benefits may be direct, stemming from immediately discernable improved performance of

individuals and teams. This might result in efficiencies in care and reduced errors that more than offset the costs of simulation based training. Many benefits probably depend on long term cumulative synergies.

13.14 Types of Simulation

There are 4 types of simulation:

- Simple
- Mechanical
- Standardised Patient
- Virtual Scenario

Simple simulation allows practice of basic skills with minimal supervision; it is relatively inexpensive, and it is available 24 hours. The learner is able to practise to the point of automaticity for simple skill. However, there is no direct feedback to the learner. There is also lack of patient interactivity.

Mechanical simulation can be further divided into simple mechanical and complex mechanical. Mechanical simulation allows practice of more complex skills and teamwork and also allows for varied levels of risk. Having learnt from mechanical simulation, students will have the basic skills when they enter an operating room or clinic. Mechanical simulation, however, involves high cost, need of supervision and lack of patient interactivity. It is also time consuming and requires dedicated space and personnel.

Available Technologies

Part-Task Trainers

Part-task trainers consist of representations of body parts/regions with functional anatomy for teaching and evaluating particular skills, such as plastic arms for

venipuncture or suturing, or head/neck/torso mannequins for central line placement or endotracheal intubation. In most cases, the interface with the user is passive - the user performs some procedure with no response from the model.

These trainers generally have lower engineering fidelity and do not require sophisticated technological components, making them less expensive, yet they can reproduce the tasks to be assessed with moderate to high degrees of psychological fidelity.

There are numerous simulators for teaching of general examination skills. For example, ocular examination simulators consist of a mannequin head whose eyes have variable pupil sizes for teaching fundoscopic technique, allowing examinees to use a real ophthalmoscope for diagnosis of normal eyegrounds, as well as many pathologic retinal findings of common diseases. Breast exam trainers simulate realistic anatomy for teaching technique and ability to diagnose pathologic findings (cyst, lipoma, fibroadenoma, carcinoma); some even allow training of procedural skills, such as cyst aspiration.

For emergency skills, Laerdal Medical created Resusci Anne, one of the earliest mannequin simulators, for teaching and practising critical lifesaving techniques (Laerdal Manikins, 2007). Although it mimics a full-sized adult, rather than just one body part or region, it is still essentially a task trainer, with functional anatomy for performing ventilation and chest compressions, but no (patho)physiologic functions or interactive features. Child- and infant-sized mannequins are available for analogous pediatric skills training and assessment.

Computer-Enhanced Mannequin (CEM) Simulators

Computer-enhanced mannequins consist of life-sized (often full-body) mannequins connected to computers, which reproduce not only the anatomy but also normal and pathophysiological functions. The interface with the user can be active or even interactive. In the former case, the simulator responds in a preprogrammed way to user actions (for example, if in ventricular fibrillation, the heart rhythm will change to sinus rhythm whenever the user shocks the mannequin); with interactive programming, the simulator response will vary according to user actions (for the previous example, the heart rhythm will only return to sinus rhythm when a certain energy level is used for defibrillation). Such high fidelity simulators often contain high-tech components, making them more costly. Training with CEMs can focus on individual technical skills (such as ability of a paramedic to intubate) or team communication skills (an emergency department resuscitation scenario). CEMs are adaptable to a host of simulation scenarios, and thus are more generally applicable to multiple disciplines.

Those specialties with high-risk performance environments (particularly anesthesiology and emergency medicine) have led the expansion in medical simulation by incorporating these technologies into their training and evaluation programmes; following the example of flight simulators in commercial aviation, the focus has been on emergency or crisis management skills, both of individuals and teams. Sim One was the earliest such CEM: introduced in 1967, it was a full sized mannequin with computer controls that interfaced with an anesthesia machine and simulated hemodynamic, cardiac, and airway problems (Abrahamson, Denson, and Wolf 1969). This prototypal simulator no longer exists, but – despite computer and other technological advancements that have allowed significant improvements in later systems—the general concept and design of Sim One still serve as a template for current

human patient simulators. A present-day descendant of the high-fidelity anesthesia simulators, and perhaps the most sophisticated CEM, is the Human Patient Simulator (HPS) from Medical Education Technologies, Inc. (Human Patient Simulator 2006). This adult-sized mannequin simulates not only blood pressure, multiple peripheral arterial pulses, and breath and heart sounds, but also muscle twitch from nerve stimulation, pupillary reflexes, salivation, lacrimation, and bleeding from several anatomic sites. A system included with the simulator (or conventional external monitors) can display vital signs, electrocardiogram, oxygen saturation, and other physiological parameters in real time; these recordings are particularly useful when the HPS is used for assessment. In addition, the simulator responds appropriately to the administration of multiple medications and to a host of procedures, including intubation and ventilation, chest compressions and defibrillation/ cardioversion, needle or tube thoracostomy, and arterial and venous cannulation. The HPS contains multiple preprogrammed patient profiles and can simulate numerous scenarios involving these patients; educators and evaluators have developed many more customised programmes for use in particular settings, and these are often freely available online or from simulation users groups.

Virtual-Reality (VR) Simulators

Virtual-reality simulations are even newer innovations in which a computer display simulates the physical world, and user interactions are with the computer within that simulated (virtual) world. Existing technologies now allow for very high-fidelity simulations, ranging from desktop computer-generated environments (much like those in 3-D computer games) to highly immersive VR (such as CAVE simulations where the user wears goggles and sensor-containing gloves and/or sits within a specially designed display). Sound and visual feedback are often

highly realistic in these simulations, with recent progress in haptic (touch feedback) technology improving the feel of the experience as well.

Commercially available VR systems (and more are under development) simulate a wide variety of procedures, ranging from relatively simple non-operative techniques such as intravenous cannulation to more complex surgeries such as laparoscopic cholecystectomy, and from percutaneous catheter-based approaches such as carotid artery stenting to endoscopic methods such as flexible sigmoidoscopy.

Beyond these applications for training of procedural skills, however, VR simulators can facilitate learning of other patient management and communication skills; VR simulations can be used to teach both individual and collaborative skills.

One potential advantage of training in the virtual environment is that learners need not be co-located with other team members. Just as with educational programmes delivered via the Internet or teleconferencing, distance learning in virtual but realistic clinical contexts is now possible. For example, in a virtual emergency department for trauma resuscitation scenarios or a virtual delivery room for neonatal exams, we can remotely and simultaneously train multiple participants, as they take part in the management of virtual patients in a computer-generated environment. Institutions like the University of Otago have set up the Otago Virtual Hospital (OVH) (<http://hedc.otago.ac.nz/magnolia/ovh.html>), a virtual hospital in which medical students, playing the role of junior doctors/housemen, solve open-ended clinical cases. These cases are written by practitioners and drawn from real-life events. Reflecting the actual practices in a New Zealand emergency department (ED), students can use their avatars to move around the hospital; communicate with patients and peers

via text chat (e.g. to take patient's history); examine the patient (e.g. requiring interpretation of chest sounds); order laboratory and radiology tests from an extensive list; check the results of these tests (e.g. X-ray images); share documents with peers (e.g. ECG results); prescribe from a range of medicines readily available in New Zealand Emergency Departments and write patient admission / discharge / handover notes.

Using "Virtual-reality simulations" in which a computer display simulates the physical world, and user interactions are with the computer within that simulated (virtual) environment, students in healthcare profession will be taken through various sites:

1. At Home: using scenario, students learn first-hand how to manage patients in their homes.
 2. Clinic: using scenario, students learn work flow in clinic, consulting skills, team working, communication, professionalism etc.
 3. Hospital (example scenario below, also to include CPR and other emergencies): multiple learning opportunities, multi-disciplinary team training.
 4. Long term care (including rehabilitation): self-care and monitoring, access to clinic/hospital, access to information, access to medication (e.g. by courier to be delivered to patient's home)
- Using technology to help patients in managing their health / chronic diseases: appointment, access for patient to check medication & other aspect of management, getting reminder on medication, online consultation etc. Commercially available eKlinik (cloud group clinic) for home care, primary care and tertiary care.
 - EMR in place for sharing of patient's information, and to support integrated, boundary-less care of patients: in particular those with chronic diseases.

- Call centre: to provide quick access to manage acute episodes, to provide access to relevant and accurate information, to provide online appointment and other functions.

Skills that can be enhanced via virtual settings include critical thinking and problem solving skills whilst there may be limited benefit where communication skills are concerned. Resources that will need to be developed include thinking, planning and writing scenarios with healthcare professional and patient interactions. This would be a complicated challenging task in itself. New softwares, programmes and equipment will necessitate the need for training of all involved before successful outcomes can be achieved.

13.15 Instructional Design

Chiniara *et al.* described a comprehensive instructional design for simulation in healthcare (Chiniara *et al.*, 2012). For simulation to integrate and be successful as a learning tool, the delivery of the instruction design must involve four levels of learning experience. Level 1 would be the instructional medium which forms the basis of learning. It consists of textbooks, lectures, computer-based learning, videos and others. This medium is considered the core of learning whereby it should be the principal mode of delivery of instruction (Cook, 2005).

The decision of using stimulation as a learning tool is dependent on certain factors that can be illustrated by using a zone of stimulation matrix. The zone of stimulation matrix is broadly divided into four levels based on two characteristics: acuity and opportunity. Acuity is defined as the potential severity of an event or a series of events and their subsequent impact on patient. Opportunity is defined as the frequency in which a particular department or individual is actively involved in the management of the event. In other words, acuity denotes how severe a medical

condition is and opportunity denotes how frequent this condition occurs. The zone of stimulation matrix thus is divided into high-acuity low-opportunity, high-acuity high-opportunity, low-acuity low-opportunity and low-acuity high-opportunity. Simulation is most beneficial if used for conditions with high-acuity low-opportunity. Simulation sometimes is useful for conditions with high-acuity high-opportunity or low-acuity low-opportunity. Simulation is not useful in conditions with low-acuity high-opportunity.

Simulation modality forms level 2 of this instructional design (Chiniara *et al.*, 2012). The choice of simulation modality will be dependent on the type of learning experience needed. Simulation modality can be computer-based, procedural-based, simulated clinical immersion, a simulated patient or hybrid-simulations. Computer-based simulation involves users interacting with the simulation through a screen based interface. Procedural-based simulation involves training the users' psychomotor skills through the use of a manikin. Simulated clinical immersion involves a simulated environment of a clinical situation by using actors or patient simulators. A stimulated patient uses an actor to interact with the user for a particular clinical scenario. A hybrid simulation involves the use of two or more of the above simulation modalities.

Level 3 of this design is the instruction method. Instruction method or mode represents the specific technique used for learning (Gagne' & Medsker, 1996). Any methods can be used depending on the outcome intended. These methods can be self-directed learning, instructor-based learning or instructor-observed learning. Self-directed learning allows learners to set their time and pace of learning. Instructor-based learning requires instructor's supervision, learning with certain involvement of the instructor. Instructor-observed learning allows learners to learn independently without interference of the instructor but allows feedback from the instructor.

The final level (Level 4) of the instructional design is presentation. It involves how the simulation is shaped, designed and carried-out. Presentation consist of the types of simulator, scenario, feedback, simulation team members etc. Types of simulator can be actors, computer or web application, a part-task trainer (a synthetic simulator that replaces a component of a patient or system), patient simulator (life size patient manikin), real patient, virtual patient, virtual reality or virtual world.

13.16 Challenges of Simulation-Based Healthcare Education

Costs are often among the most significant challenges to implementing a simulation programme, especially those utilising sophisticated technologies. High fidelity patient simulators can range in price anywhere from ~\$30,000 up to ~\$250,000. Beyond the initial purchase price, there are ongoing costs to operate, store, maintain, and update the devices. In addition to these obvious direct financial expenditures, educators should not underestimate the human resources required in any training programme, including those employing simulation-based methods. Even relatively low-tech simulations entail costs associated with recruiting and training personnel. Development of scenarios for use in simulator-based training can also be time- and resource-intensive. Ideally, pilot testing of these schemes should occur, and this has associated costs that accrue even before programmes are implemented.

Another drawback of some simulators for education is lack of portability: they may be bulky, and their computer or other hardware components may be delicate, limiting training to dedicated centres and controlled environments. This imposes significant disadvantages if we are trying to train pre-hospital providers or military personnel in a realistic field setting. Moreover, many devices simulate only specific conditions or procedures; although such models may have very high fidelity within their domains, the lack

of flexibility for a wide range of clinical contexts or skills is a limitation of these tools. Rational allocation of resources for training programmes—whether at the level of medical schools, residency training programmes, credentialing bodies, or certification boards—demands evidence that the investment will yield valuable results.

13.17 Features and Uses of High-Fidelity Medical Simulations that Lead to Most Effective Learning

A recent systematic review from the Best Evidence Medical Education (BEME) Collaboration addressed this issue in the question: “What are the features and uses of high-fidelity medical simulations that lead to most effective learning?” We identified 10 features that healthcare educators should know and adopt when using high-fidelity simulations (Issenberg *et. al.*, 2005):

1. **Feedback.** Feedback provided during the learning experience is the most important feature of simulation-based education to promote effective learning.
2. **Repetitive practice.** Learners should engage in focused, repetitive practice where the intent is skill improvement, not just idle repetition.
3. **Range of difficulty level.** Learners should engage in skills practice across a range of difficulty levels, beginning with basics and advancing to progressively higher difficulty levels based on objective measurements.
4. **Multiple learning strategies.** Depending on the learning objectives being addressed, simulation-based training strategies should be flexible, including instructor-centered formats, small group tutorials, and independent study.
5. **Clinical variation.** Simulations should represent a wide variety of patient problems to provide more sampling than simulations that only cover a narrow patient range.

6. **Controlled environment.** Simulations work best when embedded in controlled educational settings where (unlike real clinical environments) learners can make, detect, and correct patient care errors without negative consequences.
7. **Individualised learning.** Simulation-based educational experiences, individualised according to particular learner (or team) needs, should engage trainees as active participants, not passive bystanders.
8. **Defined outcomes/benchmarks.** Educational goals should have tangible, objective measures that document learner progress in terms of training benchmarks.
9. **Simulator validity/realism.** The simulation and the behaviour it provokes should approximate the clinical challenges that occur in genuine patient care contexts.
10. **Curricular integration.** Simulation-based educational experiences should be routine or required features of the normal educational schedule, not optional activities ("just for fun").

13.18 IMU SWOT Analysis

Medicine (includes Medical Sciences, Clinical School), Pharmacy, Dentistry, Nursing, Nutrition & Dietetics (N&D) and Chiropractic did a SWOT analysis of their respective programmes in terms of teaching-learning using simulation. A summary of the strengths, weaknesses, opportunities and threats are presented below:

Strengths

- Availability of space in Clinical Skills Simulation Centre, Bukit Jalil (CSSC, BJ).
- State of the art equipment: CCTV recordings, large TV display units.
- 28 bedded open ward concept.
- Availability of models and manikins (of low fidelity).
- Availability of a technician for the above.
- Strong management support in terms of budget.
- Input from PMS into clinical skills training.
- Availability of simulation lab and adequate number of manikins in CS Seremban.
- Availability of case scenarios.
- Clinical students have adapted and are comfortable using the simulation lab and manikins.
- Hybrid simulation has been used, combining manikins with actors for simulated case scenarios.
- Availability of e-learning platform as springboard to simulated pharmacy practice experiences (aligned to the course outcomes); medication therapy management and e-prescription activities.
- Availability of e-learning platform to provide e-simulated activities for early semesters: role of pharmacist, inter-professional activities in hospital setting, scenarios focussed on ethical and professional issues.
- 64 state-of-the-art simulators in SimLab, instruction on usage given in Semester 2 at commencement of lab sessions. All simulators equipped for mechanical work in ergonomically realistic environment.
- Each simulator is with a workstation and equipped with monitor for video or static instruction with hi-fidelity sound broadcast system.
- Students complete each required competency before being allowed to practice in the clinics.
- Students work in pairs and learn the art of treating as well as assisting, teamwork and communication.

- Compatible with training done in Partner Dental Schools (PDS).
 - One intake of students for dentistry annually results in adequate supervision.
 - Technicians on site for trouble shooting and maintenance.
 - All simulators and clinics in BJ premises, so students can go back to simulators any time to refresh their skills.
 - Skills centre has space identified for each programme.
 - Core of enthusiasts exists.
 - Curriculum teaching can be integrated.
 - Clinical skills models available to complement simulator.
 - Learning and practising of diagnostic and manual skills.
 - State of the art A/V equipment with internet and recording capabilities.
 - Onsite radiographic facilities and mock facilities for hands on educational experience using chiropractic student simulated patients.
 - Sets of anatomical models for reference and visualisation exercises. Such models can be used in exercises to develop surface and deep anatomical landmark palpation as well as palpation of anatomical spatial relationships.
 - Availability of Speeder Boards for the development of manual manipulative techniques.
 - Experienced educators with broad and deep practical experience in education and practice.
 - Willingness of faculty to engage students outside of scheduled laboratories.
 - Semesters 7 & 8 interdisciplinary learning unit with Dentistry.
 - Systemic use of fellow classmates and lower year chiropractic students as simulated patients provides exceptional feedback opportunities as well as developing empathy for future patients.
 - Availability of IMU patient simulators.
 - Opportunities to provide public outreaches increase communication skills and professionalism.
 - Interaction with other health disciplines at IMU develops understanding, professional relationships and the opportunity for team building within the healthcare system.
 - Availability of adequate facilities and space in CSSC for use by N&D students.
 - Availability of case examples to write and simulate scenarios.
 - Availability of experienced faculty to facilitate simulated sessions.
- Weaknesses**
- Constraints of staffing, training of staff, and dealing with 2 intakes of medical students a year.
 - Lack of simulation lab space in Clinical School, not much more can be done with current facilities.
 - Absence of trained operator to run and manage SimLab and manikins.
 - Only used by a few departments, while others have not adopted virtual learning via simulation or manikins.
 - Manikins generally used for single skill training. Lack of simulated case scenario based learning on the manikins.

- Lack of IT support/software/staff to develop more interactive case scenarios and other e-simulated activities.
- Not contributing to overall patient experience: lack of interaction and communication in the available activities. Virtual patient softwares, high fidelity simulators and disease-specific manikins may improve overall patient experience in the simulated environment.
- Simulators are passive and do not contribute to an overall patient experience.
- Students must have each step evaluated before moving to the next one leading to time wastage.
- The supervisor can evaluate and give feedback on the final outcome but not the process.
- There is a potential for possible bias between student evaluations.
- High-fidelity simulator not available yet in BJ, may need more than 1 unit.
- Storage place not sufficient.
- Space identified but layout may not be appropriate for simulation lab.
- No simulator technician to support handling of high-fidelity simulator system – ACLS, PALS.
- NRP training requires all this support.
- Faculty not familiar with simulation teaching.
- Need a large pool of trainers from all faculty.
- Physical lab facilities almost at full capacity with currently no prospects for expansion.
- Division understaffed with difficulty in attracting experienced educators.
- Single available appropriate lab space creates scheduling dilemmas and limits number of stations for OSCE exams utilising simulated patients.
- Lack of radiographic case files for which simulated case studies may be generated.
- Lack of mechanism to practise real life radiography (legal issues).
- No significant training of classmate simulators decreases effectiveness of interactions and particularly development of communication and professional skills.
- Current use of classmates or IMU simulated patients provides narrow case mix for physical training of mechanical dysfunction diagnosis and actual manipulative skills.
- Current silo structure of professional programmes at IMU limits integration and interdisciplinary teaching/learning – Reference Royal University Hospital, Saskatoon, Canada.
- Pressure to increase class sizes puts further strain on faculty and other resources within division.
- No current presence of chiropractic postgraduate training for future chiropractic researchers and educators.
- Inadequate training of SP for dietetic scenarios.
- Lack of skilled instructors to train N&D faculty for simulated learning.
- Increased workload and time on faculty (preparation of scripts, training & assessment).
- Cost in remuneration of SP.
- Simulated learning in food service and community dietetics not implemented in curriculum.

- Development of softwares beyond manpower and resources of eLearning and will have to be outsourced.

Opportunities

- Availability of many PMS, and many IHH hospitals.
- Availability of expatriate community to serve as SPs.
- Availability of a pool of trained SPs (>60 persons).
- Deployment of 2 nurses as nurse educators: for simulation and CSSC.
- Streamlining competencies in Medical Sciences and Clinical School.
- sing simulation across all departments in BJ and in inter-professional learning (IPL).
- CSSC Clinical School (CSSC CS) has conducted courses within IMU for students and faculty as well as for private and public hospitals: available clientele.
- Training opportunities for students to be familiar with acute clinical situations.
- Training opportunities for students to be familiar with common clinical procedures.
- Extending training to practising doctors & paramedics in IHH hospitals.
- Extending training to postgraduate doctors.
- Achieving learning experience which is difficult to achieve in clinical posting or in actual practice: e.g. Medication Therapy Management.
- Scope for virtual online pharmacy to support health promotion, self-care, patient safety and to develop experiential learning environment in community pharmacy set-up.
- Enhancement of learning through feedback and reflection through the use of video facilities.
- Students achieving competence in common standardised technical skills, as well as in high risk, low occurrence medical situations (e.g. medication errors).
- With increase in student numbers, simulation helps to overcome constraints in placement or classrooms.
- Shared simulated activities provide opportunities to interdisciplinary and multidisciplinary learning.
- Enhancement of knowledge integration among different departments in Pharmacy School.
- Greater readiness for more complex procedures when students reach the clinics.
- An increasing number of Partner Schools for students.
- Simulators are for internal and external CPD.
- All programmes can benefit from this project.
- Opening market niche to train others to help meet demand of specialised healthcare professionals and healthcare providers.
- Able to open courses to the public as well.
- Current climate and upper level support within IMU for integrated teaching/learning and interdisciplinary cooperation.
- IMU's medical faculty and school have resources that may overcome several weaknesses, particularly related to availability of radiographic teaching files and closer cooperation for simulation teaching/learning.
- IMU's healthcare side and the existence of the medical clinical school in Seremban provides the opportunity to explore clinical opportunities for chiropractic housemen,

our chiropractic interns and interdisciplinary cooperation including the development of cases to be used in simulation teaching/learning.

- The chiropractic division sees opportunities to partner with chiropractic programmes in Canada and the United States and benefit from computer simulations in use.
- There are opportunities for chiropractic students to become simulated patients for medicine and dentistry and further add to interdisciplinary education.
- There are opportunities for medical and dental students to become simulated patients for chiropractic and further add to interdisciplinary education.
- There are opportunities to develop postgraduate programmes at IMU to develop our future educators and scientists who are experienced in developing simulation models. With the involvement of ICE, IMU could develop a chiropractic educational product specifically for other chiropractic programmes around the world.
- Students are better prepared for real-world placements, ready to work on higher level of clinical care for both students and preceptors during external placements or postings.
- Students with experience in simulated learning will have increased self-sufficiency: hence placement may accommodate more students.
- Inter-professional learning opportunities between N&D and other programmes.
- Opportunities for simulated learning in food service, community dietetics and in research.



Threats

- CSSC training focus may be inappropriate for junior medical students if there is greater emphasis on high fidelity.
- Rapid change in technology and equipment: existing hardware and software becoming outdated.
- More space needed for CSSC for programmes like Chiropractic.
- Lack of faculty enthusiasm.
- Costly equipment maintenance.
- Need support from School and staff, time constraints to develop simulation learning.
- Heavy burden for departments involved in simulation learning.
- An increased number of dental schools that offer cheaper education.
- The number of staff required for supervision inadequate for increasing student numbers.

- Funding may not be secure.
- Maintenance of simulator and equipment high – frequent usage.
- Workload of faculty: full time teaching, online teaching, ongoing research work – trainings may take place outside working hours.
- Insufficient staffing.
- Space expansion in CSSC.
- Few faculty familiar with simulation teaching/learning methods.
- Chiropractic specific computer simulation products undeveloped or costly to attain.

13.19 Integration Across Disciplines

Strengths

- Cross teaching occurs in about 20% of the teaching – learning hours in most disciplines.
- Interprofessional learning occurs amongst most disciplines: e.g. Dentistry and Medicine, Nursing and Medicine, N&D and Pharmacy etc.
- Availability of an e-learning site that is accessible to all disciplines.

Weaknesses

- Distributed learning among senior students in many disciplines causes dispersion of students from simulation learning site.
- Accessibility to e-learning system is compromised due to the inability of the server to maintain access demand.

- Lack of training of the trainers to produce appropriate materials for integrated learning across disciplines.

Opportunities

- Clinical Scenarios can be developed to closely simulate real life clinical situations which usually require interdisciplinary approach.
- Content experts from various disciplines are available under one roof to contribute to Simulation Teaching-Learning for all health professionals.
- Patient-centred care system can be introduced as all disciplines will be managing the same case scenarios.

Threats

- Lack of cooperation from any discipline in contributing towards development of simulation training.
- Needs a committed and dedicated lead teacher who can take charge of learning and teaching for all disciplines.
- Cost of planning the learning activities increases as schedules need to be revised.

13.20 Integration Across Disciplines on Core Values, Ethics and Professionalism, Patient's Safety

Strengths

- The basic principles of ethics and professionalism can be integrated easily into the contents of simulated teaching-learning.
- Core values can be explicit in each activity outline.
- Patient's safety goals can be made available in all activity outlines.
- The theory and knowledge base of these initiatives can be provided online and serve as constant reminders.



Weaknesses

- The value of such integration may not be truly reflected in actual practice.
- The evaluation of its internalisation could be difficult to perform.
- The ideal values and goals learnt at simulation practice may be different in real practice where other factors may affect the way some values and goals are interpreted.

Opportunities

- Allows students to practise under controlled environment where mistakes could be rectified.
- Increases confidence level thus improves competencies in clinical areas.
- Sharing of experience in simple and complex scenarios by content experts.

Threats

None.

13.21 Recommendations: Using Simulation to Improve Teaching-Learning, Patient Safety and Inter-Professional Learning

1. Provide a safe environment for teaching-learning in a common-user "Simulated Learning Unit".
 - In clinical training, using simulated clinical scenarios and manikins would allow the content experts from various disciplines to contribute in creating learning activities to suit the level of competencies of students from different schools.
 - Simulated teaching activities can incorporate different practical and procedural skills that are relevant to specific disciplines conducted at the same time.
 - Mistakes can be rectified instantly, coupled with feedback, will help students to learn in their own time and without stress and anxiety.

2. Create a 'virtual platform' for broader learning process as patients can be engaged in simulated scenarios or activities.
 - With the advanced technology in multimedia system, direct communication with patients through live systems can be organised during actual learning and teaching activities. Students from various areas can come together virtually to learn about the same scenario through such system.
3. Use 'care bundle approach' in acute simulated clinical scenarios or intensive care.
 - The steps that need to be followed to complete each task will determine success of patient care?
 - It could be carried out as virtual learning or face to face simulated teaching in a controlled environment.

13.22 Simulation in Teaching-Learning in IMU

In order to adopt simulation-based teaching, establishment of the infrastructure, acquisition of learning resources, and training of the educators are necessary. In addition, there should be budget allocation for maintenance of the equipment and other resources. Thus, heavy investment is required for the setting up and maintenance of a simulation-based teaching centre. For instance, in Australia a capital funding of \$46 million and recurrent funding for 2010–11 of \$48 million was invested to further develop stimulation-based education capacity (Weller *et. al.*, 2012).

The Clinical Skills & Simulation Centre needs to be further upgraded with the proper resources and effective IT support to ensure smooth running of simulation teaching-learning activities. The education resources required include plastic models for partial task training, mannequin-type simulators, screen-based virtual-reality simulators, and simulated or standardised patients (Akaike *et. al.*, 2012). In addition, recruitment of the appropriate teaching and support staff is needed to ensure effectiveness of simulation-based

teaching. It is strongly recommended that nurses play a bigger role in simulation of teaching-learning activities. It should be realised that clinical experience alone is not a proxy for simulation instructor effectiveness, and simulation instructors and learners need not be from the same healthcare profession (McGaghie *et. al.*, 2010). Visits to our PMS (e.g. St George's University) and medical schools in the region (National University Singapore) where simulation teaching has been successfully implemented would be beneficial to our faculty. Experts from PMS may be invited to come for short attachment with IMU to train our faculty.

Besides the mannequins and other equipment, the use of simulated patients should be continued as a teaching modality in simulation-based education. Simulated patients are still relevant in the teaching and assessing of skills such as communication skills (e.g. history taking). Proper training of the simulated patients is crucial to ensure the session is effective. The pool of simulated patients may include part-time actors, as practised in UK partner schools. In addition, teaching resources such as case scenarios, real experiences and course content (e.g. video and journal articles), and assessment tools such as test scores and exam blueprints need to be developed.

The pedagogy of simulation-based education and their benefits should be disseminated to faculty to get their buy-in. Interdisciplinary team-based learning is important for the success of simulation-based education, and this will also further promote inter-professional learning, which is emphasised in IMU educational philosophy. An interdisciplinary team training programme that incorporates proven methods of team management needs to be established.

The effectiveness of simulation teaching should be regularly assessed and may form part of Medical Education research projects. The IMU Centre of Education (ICE) should conduct relevant training to enhance the research capacity of our faculty in designing the appropriate research questions regarding simulation teaching-learning. Some of the gaps

in understanding of stimulation-based medical education research that warrant further research include aspects on feedback, curriculum integration, outcome measurement, skill acquisition and maintenance, mastery learning

and instructor training (Table 13.1). Thematic research programmes based on the questions raised should be formulated (McGaghie *et. al.*, 2010).

Table 13.1 Gaps of understanding in simulation-based education that warrant further research (adopted from McGaghie *et. al.*, 2010).

Stimulation features	Gaps in understanding / Research questions
1. Feedback	<ul style="list-style-type: none">• What model of feedback?• What dose of feedback?• How to gauge quality of feedback?• Feedback adaptation to educational goal?
2. Curriculum integration	<ul style="list-style-type: none">• What is the best mix of learning modalities?• How and when to best integrate with other modalities?
3. Skill acquisition and maintenance	<ul style="list-style-type: none">• What are the mechanisms of skill maintenance?• What determines the conditions of skill decay: person, context and tasks?
4. Mastery training	<ul style="list-style-type: none">• What are the sources of variation in time to mastery standard: cognitive aptitude, motor skill, professional experience?• What is the level of resources needed?
5. Team training	<ul style="list-style-type: none">• What approaches should be used to determine the appropriate clinical team composition and assembly?• Are team members interchangeable?• What are the factors that affect team skill maintenance?
6. Instructor training	<ul style="list-style-type: none">• Should simulation instructors be certified for various devices?• What are appropriate mastery learning models for simulation instructors?• Should the training be specific to simulation or general teaching skills?

13.23 Specific Recommendations

13.23.1 Medicine

1. Upgrading of CSSC CS: convert second floor completely to CSSC, with bigger rooms for teaching practical skills, clinical skills using simulated patients and simulated teaching using manikins. There is a lot of potential for the utilisation of CSSC if the inadequacies are addressed.
2. More undergraduate communication skills training using the standardised patients available in our “patient bank”, encompassing ethics and professionalism and any other areas.
3. Acute medical or obstetric emergencies: Students practise these skills at their own time using the simulation lab where the scenarios are already available in the system.

4. The sessions can be recorded and replayed with or without the teachers: to improve learning.
5. Training of professionals especially procedural and practical skills using simulation. Surgeons can come and train the surgical skills they need to sharpen on their own. We provide the facilities.
6. Offer skills training to private and public hospitals for nurses, house-officers, medical officers and even specialists.
7. We can provide the facilities, help coordinate courses that other institutions want to conduct.

13.23.2 Dentistry

1. The curriculum should be modified to include simulation in all areas that it are deemed necessary.
2. Simulators like DentSim and Simodont have great potential for an improved student learning experience, as do virtual world software like Second Life. While newer technologies are emerging even now, older ones are in a continual upgrading process and it is envisaged that there will be a definitive improvement in simulations within 5 years. However, given the evidence of the effectiveness of these current simulators, it should be recommended that IMU invest in students' learning experience and supplement the existing simulations with the current technology available at hand. This will also go a long way in enhancing skills of our students as well as ensuring patient safety at every level.
3. Virtual worlds like Second Life be incorporated in teaching – learning activities where they could provide most benefit.
4. Collaborations be created with other schools in Malaysia as well as worldwide (including Partner Schools) to enhance opportunities for inter-professional learning.

13.23.3 Nutrition & Dietetics

1. Need for more research to validate simulation as a teaching-learning strategy.
2. Need for more research to validate simulation in assessment/evaluation method in the field of dietetics. This is because many dietetics programmes have not fully utilised this method for clinical skills assessment compared to real life patient assessment.

13.24 Conclusion

Virtual hospitals based on simulation-based training have the potential to initiate entirely new educational applications in healthcare. Evidence-based practices can now be activated with protocols and algorithms, which can be practiced safely with the help of simulation scenarios. However, a vital component towards this will be to ensure integration within the curriculum of each programme. Resources have to be identified and acquired early on, whilst faculty will have to be engaged and trained. Teamwork within the pedagogy in a simulated environment will enhance and supplement the didactic instruction, and ensure better outcomes for a safe patient experience. Interprofessional education within differing healthcare specialties will benefit from the virtual environment and with the adoption of simulation as a standard of training and certification, healthcare systems may be seen as becoming more responsible and ethical by the community. Case scenarios in various virtual settings train doctors and healthcare professionals of the future to support care of patients by harnessing technology, promoting patient-centred care, patient safety, integrated, boundary-less care, and in overcoming many of the shortfalls in the present system of healthcare.

Example Gilbert Program in Medical Simulation: Simulation Casebook: Harvard Medical School Draft of the 1st edition (2011), updated 3/2/1. See Appendix 1 below.

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13.26 Appendix

Example Gilbert Programme in Medical Simulation:
Simulation Casebook

Harvard Medical School Draft of the 1st edition (2011),
updated 3/2/12

Anterior Myocardial Infarction

I. Target Audience: Medical Students, Residents

II. Learning and Assessment Objectives

Participants are expected to understand the scientific and humanistic issues underlying the disease assessment and treatment plan, and to critically consider and deploy the therapeutic options described.

Participants should provide a concise presentation of the patient to each physician consultant who participates in the exercise. Debriefing sessions by on-site clinical faculty is essential to discuss critical thinking and knowledge pathways, and to provide a forum for individual and team reflection on learning and practice goals. While the case descriptions are written with medical terminology, it is important that the provider and patient (i.e. the simulator) engage in authentic dialogue with lay terminology to reflect an actual patient encounter.

Critical Actions Checklist:
DONE CRITICAL ACTION

- _ Telemetry monitoring
- _ Patient history
- _ Physical examination
- _ Supplemental O2
- _ IV Access

- _ Immediate ECG and portable CXR (within 10 minutes of start of case)
- _ Obtain appropriate laboratory studies: cardiac biomarkers
- _ Administer immediate aspirin
- _ Administer pressor agent
- _ Administer anticoagulation medication
- _ Consult cardiology for further treatment

III. Environment

- A. Simulation room set up: Emergency Department
- B. Manikin set up:
 1. High fidelity patient simulator
 2. No moulage needed
 3. Lines needed
- C. Props:
 1. Code blue cart
 2. Lab values (see Appendix A)
 3. Images (see Appendix B)
- D. Distracters: none

IV. Actors

- A. Nurse: facilitate scenario
- B. Consultants (optional for higher level residents who can provide interpretation on their own)
 1. Radiologist: reads chest x-ray
 2. Cardiologist: reads ECG, recommends treatment plan

Case Narrative

PATIENT: 60 year old

CC: Chest pain, “There is an elephant sitting on my chest.”

HPI: Use lay terminology as the voice of the patient
Patient complains of crushing substernal chest pain radiating to his neck and jaw on the left side.

Symptoms started one hour ago during a business meeting. Patient had to excuse himself from the meeting as he became obviously diaphoretic and pale.

Patient reports nausea and lightheadedness after the onset of the “crushing” chest pain. Patient denies fevers, chills, vomiting, and palpitations. Patient reports mild shortness of breath and one previous episode of chest pain that lasted about 15 minutes one week ago that resolved spontaneously while he was in Japan.

PMHx:

Hypertension

MEDICATIONS ALLERGIES

Lisinopril Codeine
Shellfish

PSHx:

Hernia repair, age 22

SOCIAL Hx:

EtOH: Occasional
Tobacco: Denies
Illicits: Denies
Occupation: Ambassador to the U.S.
Additional: Married

FAMILY Hx:

Father: Gastric cancer, expired age 80

ROS:

(+) Chest pain with radiation to neck/jaw, mild shortness of breath, diaphoresis, nausea, lightheadedness
(-) Denies palpitations, vomiting, headache, blurred vision, numbness/motor weakness, abdominal pain, urinary symptoms, or fever/chills

PHYSICAL EXAM: Those signs not demonstrable by the mannequin should be verbalised when students perform / verbalise the examination manoeuvre

HR BP Temperature (°C) O2 Sats (RA) RR

110 88/60 37.5 92% 24

GENERAL: A&OX3, moderate distress

HEENT: PERRL/EOMI

NECK: Supple, no JVD

CV: 2/6 systolic apical murmur, tachycardia

PULM: Diffuse rales all lung fields

ABD: Soft, NT/ND, + BS

EXT: No C/C/E, palpable pulses all extremities

NEURO: WNL, MAE X 4, grossly intact

LABS: See Appendix A

Amylase/Lipase Level Comprehensive Metabolic Panel

Arterial Blood Gas Hepatic Panel

Basic Metabolic Panel X Lactate/Cortisol Level

Cardiac Markers X Thyroid Panel

Coagulation Profile X Toxicology Screen

Complete Blood Count (CBC) Urinalysis

CBC with differential X Urine HCG

Additional Labs: none

IMAGES: See Appendix B

Angiogram ECG X

CT Scan, with contrast MRI

CT Scan, without contrast X-Ray X

Echocardiogram Ultrasound

Additional Images: none

CONSULTS:

Cardiology – Dr Jones: ECG will be read as STEMI in leads V1-V6 and leads I and AVL. Cardiology will recommend preparing the patient for cardiac catheterisation: aspirin, Plavix, heparin, and "... if it's safe in light of the patient's vital signs," B-blocker and nitroglycerin. Indicate that the catheterisation team will need about 20 minutes to get in and that the patient must be stabilised prior to catheterisation.

Cardiologist asks the students to tell the patient that they will need to have a cardiac catheterization.

If vitals have not been stabilised, tell participants to call back after blood pressure and other vitals improve. If participants ask about increasing the pressure safely, recommend pressors (dopamine).

Radiology – Dr Smith: CXR shows diffuse pulmonary edema consistent with congestive heart failure.

CLINICAL PROGRESSION:

History and physical, IV/O₂/monitor, and immediate aspirin. Pressors should be started after physical exam and stat portable CXR indicative of cardiogenic pulmonary edema with hypotension. ECG will indicate AMI either after participants' own interpretation or after consultation.
*** If over 500 CC's IV fluids given or supplemental O₂ not initiated within the first 10-15 minutes of case, patient will continue providing history in short one word (monosyllabic) answers and indicate that shortness of breath is getting worse. O₂ saturation will drop:

HR BP Temperature (°C) O₂ Sats (RA) RR

116 88/60 37.5 88% 26

***If Morphine or Nitroglycerin given (sublingual or IV) blood pressure will drop, heart rate will increase but rhythm stays regular, patient will become less responsive:

HR BP Temperature (°C) O₂ Sats (RA) RR

122 68/50 37.5 92% 24

***If B-blockers given, heart rate and blood pressure will decrease, pt will become unresponsive:

HR BP Temperature (°C) O₂ Sats (RA) RR

100 68/50 37.5 92% 24

V. Instructor Notes

A. Tips to keep scenario flowing

1. If students are unsure of pathology, instructor can prompt the students to create differential diagnosis and lead them towards imaging and laboratory studies necessary to confirm diagnosis. Prompting can come in form of a primary care physician calling to check in on their patient.
2. If supplemental O₂ is not provided, nurse can verbalise concern as patient becomes increasingly dyspneic.

B. Scenario programming

1. Optimal management path:
 - O₂/IV/monitor
 - History and physical examination
 - Immediate aspirin
 - Appropriate lab workup: CBC, BMP, cardiac markers, coagulation profile
 - Appropriate imaging: stat portable CXR,

ECG within 10 minutes

- Administer pressor agent
- Administer anticoagulation medication (e.g. Heparin, Plavix, +/- IIb/IIIa)
- Consider administering morphine, B-blocker, and nitrates
- Consult cardiology for further treatment

2. Potential complications/errors path(s):

- Failure to administer O2
- Administering over 500 CC's IV fluid
- Administering large dose of Nitroglycerin, B-blocker, Morphine

VI. Debriefing Plan

A. Method of debriefing: Group with multimedia teaching materials

B. Debriefing materials: See Appendix C

C. Potential debriefing topics

1. Team dynamics

- a. Leadership
- b. Collaboration
- c. Communication
- d. Professionalism

2. Didactic material

a. Presentation

- i. Appropriate differential diagnosis
- ii. Varying presentation of MI in different location Contrast fluid overload requiring + inotropy from anterior MI with preload dependence and need for IV fluids in inferior MI

b. Pathophysiology

- i. Atherosclerotic vs. nonatherosclerotic causes
- ii. Laboratory results: troponin, CKMB levels

c. Treatment

- i. Need for immediate diagnosis and reperfusion for the acute M
"Time is muscle"
- ii. Role of aspirin therapy:
decrease mortality / reinfarction rates
- iii. Role of other antiplatelet therapy
 - Clopidogrel (Plavix) at 600mg dose if emergent CABG not anticipated
- iv. Role of pressors vs. fluids in the anterior MI patient
- v. Role of anticoagulants
 - Heparin: indicated in recurrent / persistent chest pain, AML, positive biomarkers, dynamic EKG changes. Dose is 60U / kg bolus followed by 12U / kg infusion, titrating to apt1.5-2.5 times control
 - LMWH at 1mg/kg BID, adjusted for renal insufficiency
 - *GP IIb/IIIa inhibitor*
- vi. Role of acute beta-blockade and nitrates
 - B-blocker: heart rate control and resultant decrease of myocardial O2 demand to reduce rates of reinfarction, recurrent ischemia and potentially mortality
 - Nitrates: preload reduction and symptomatic relief

- Contraindications in the hypotensive MI patient
 - a. Hold NTG for SBP < 90
 - b. Hold BB if signs of cardiogenic shock
- vii. Treatment options: thrombolytic therapy vs. heart catheterisation (PCI) vs. coronary bypass graft

VII. Development and Deployment

This case, along with its precursors (reference Gordon, below) and variants have been used over several years for a wide range of students, including high school, college, masters/PhD candidates, medical students (preclinical and clinical) and resident trainees. The presentation and progression is tailored to the level of the learner; often the Anterior MI case is paired with the Inferior MI case to allow students to compare and contrast diagnosis, anatomy, physiology, and management. It is commonly used as part of a “train the trainer” curriculum for faculty development in the use of simulation.



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