

The product of outcome-based undergraduate medical education: competencies and readiness for internship

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ABSTRACT

Introduction: Outcome-based curriculum is adopted at the International Medical University (IMU), Malaysia, where specific learning objectives are laid out progressively under eight major outcomes. We present an outcome-guided, self-reported competency profile of our undergraduate students near the end of their training, focusing on elements that are considered most immediately relevant for their internship.

Methods: Anonymous surveys were conducted on two cohorts of medical students in their final semester at IMU. The surveys covered a range of competencies, including practical skills, ward routines, generic attributes and evidence-based medicine, grouped under the exit outcomes as defined by the university.

Results: A total of 92 students were assessed. In general, the students were confident of their ability on common practical skills and ward routines. They were comfortable with the level of professionalism and personal attributes required for internship, with the prospect of handling unexpected additional tasks and working away from home perceived as the main difficulties. Most students referred to at least three sources of clinical information to answer their clinical queries. However, they referred more to single journals than databases or collections. The majority could critically appraise journal articles to a variable extent, but nearly half took 30 minutes or longer to trace an abstract of interest.

Conclusion: This report demonstrates the strength of outcome-based curriculum in its ability to produce competent students that are well prepared for their internship. Assessing students using this educational approach provides a clear picture of their strengths and weaknesses, and identifies stages in their training where additional inputs are required.

Keywords: clinical competence, internship, medical education, outcome-based curriculum

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INTRODUCTION

The evolution of outcome-based education from concept to practical realisation has spanned over four decades⁽¹⁾. It stemmed from the work of Tyler and Bloom in the 1950s on organising education according to instructions and objectives⁽²⁾. A clear definition was given by Spady in the late 1980s on the process of outcome-based education, as “organising for results: basing what we do instructionally on the outcomes we want to achieve”⁽³⁾. It was proposed that rather than accepting whatever outcomes that may result from a defined way of educational input, the delivery of education may be more efficient, and the graduates made more explicitly accountable, if the educational process is guided by what we hope the students to achieve at the end of their training, i.e. the outcomes⁽⁴⁾. This concept has been greeted by continuing waves of enthusiasm globally, leading to the development of educational guidelines and the revisions of school and national curricula, including those in Malaysia⁽⁵⁾. In the field of medical education, this approach however is still in its infancy.

In Malaysia, outcome-based curriculum in medicine was first adopted by the International Medical University (IMU), Malaysia. When IMU was accorded university status in 1999, the undergraduate medical programme was expanded with the introduction of the clinical phase (Phase II) training in Malaysia. Prior to this, the students only completed the first half of their training (pre-clinical phase or Phase I, first 2½ years) locally in what was known as International Medical College, established in 1992. Upon completion of Phase I, the students continued their undergraduate medical training overseas in various pre-matched universities in the United Kingdom, North America and Australia to pursue their medical degrees. With the introduction of the clinical phase, the students

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had an option of continuing their clinical training locally, and be conferred the MBBS (IMU) upon graduation.

The introduction of the clinical phase in IMU brought forth the need to devise a curriculum. This process involved a revision of the curriculum in Phase I to streamline the programme for the entire undergraduate training. Following consultation with several leaders in the field of medical education, utilising the wide connections IMU had with the partnering universities, the consensus was to adopt an outcome-based curriculum. There were eight major outcomes identified as pillars on which to base our curriculum⁽⁶⁾ (Table I). These outcomes were sufficiently broad to be applicable globally, and were in fact in line with that developed by several other medical schools and medical education authorities in Europe and North America⁽⁷⁻⁹⁾. Within each major outcome, more specific learning objectives were laid out. These learning objectives contain elements specific to the need and the expectations of the local community.

The curriculum in Phase II is delivered via a combination of problem-based learning (PBL), task-based learning and portfolio development, aided by study guides developed for a set of core clinical problems. It builds on the approach in Phase I where the predominant tool was PBL with major emphasis on self-directed learning. The curriculum aimed to equip the students progressively with the essential attributes of a competent and caring doctor. The students were assessed at the end of every posting, while major professional assessments were conducted at the end of semesters three, five, seven and nine. The professional examinations were in the form of objective structured practical examination (OSPE), objective structured clinical examination (OSCE), short answer questions and multiple essay questions, where understanding and clinical application of various elements of the eight outcomes were examined.

There was a recent revision of the major outcomes in IMU following the establishment of Global Minimum Essential Requirements in Medical Education by the Institute for International Medical Education in 2002⁽⁹⁾. The revised outcomes are also shown in Table I, alongside the original outcomes. Despite the revision, most of the learning objectives were retained with some rearrangements according to the new outcomes. The elements and levels of competency expected of our students have therefore remained largely unchanged.

In the final semester, outcome-based learning is consolidated in a programme termed Senior Clerkship, where the emphasis is on direct participation in patient management, through which actual clinical experience is acquired in preparation for housemanship. The students act as shadow housemen, working on the ground under supervision in a district hospital separate from the main teaching site, developing insights into the functioning of the local healthcare system. In this semester, the development of professionalism and other important generic attributes like team-working are also facilitated by collaboration with colleagues, allied healthcare professionals, patients and relatives. The essential competencies to be acquired during Senior Clerkship, either generic or clinical, are laid out under the headings of the eight exit outcomes. Alongside ward-based training, portfolio development represents a major tool in delivering outcome-based learning in Senior Clerkship. Portfolios are extended write-ups of case history, with reflections during patient encounters recorded as learning issues grouped under eight exit outcomes. They provide the students with a means of focused learning to complement the general exposure in their ward work, and act as documents on which students are assessed in the exit viva. The students are required to write up 14 portfolios in their Senior Clerkship. For each major posting (Internal Medicine, Paediatrics, Surgery and

Table I. The initial and the revised IMU exit outcomes.

Initial IMU exit outcomes	Revised IMU exit outcomes
1. The application of basic science in the practice of medicine	1. The application of basic science in the practice of medicine
2. Diagnosis, management and prevention	2. Clinical skills
3. Problem solving	3. Communication skills
4. The family and community contexts of healthcare	4. Community and family issues in healthcare
5. Self awareness, self-care, personal growth and life-long learning	5. Health promotion and disease prevention
6. Moral reasoning and clinical ethics	6. Professionalism, ethics and personal development
7. Appropriate use of technology	7. Self-directed life-long learning and information management
8. Critical appraisal	8. Critical thinking and research

Obstetrics & Gynaecology), the students are expected to cover all eight exit outcomes at least once among the three portfolios that they are required to produce. There are three major components in the assessment in this semester, each focusing on different outcomes, as shown in Table II.

Although the assessments ensure that the graduates are equipped with the essential attributes required of a competent and safe intern, a detailed competency profile of our students near the point of exit would be valuable as indication of the strengths and weaknesses of our curriculum, and enable continuing improvements to be made. There was previous data evaluating the Senior Clerkship Programme in IMU in terms of student satisfaction and confidence as future interns^(10,11), and also a study on the performance of IMU graduates as interns⁽¹²⁾. A detailed outcome-guided competency profile of our students in Semester 10, as we present in this paper, would complement the previous data and provide a baseline profile for a medical school in Asia that stringently follows the concepts and the delivery of an outcome-based curriculum.

The objectives of this study are to: (a) obtain a competency profile of our medical students in the final semester according to the eight exit outcomes; (b) identify the strengths and deficiencies of our students near the end of their training, thereby suggesting ways to strengthen the delivery of our curriculum according to the eight outcomes; and (c) evaluate the readiness of our students for internship in terms of generic attributes and specific clinical skills.

METHODS

An internal questionnaire survey was conducted on two cohorts of medical students at the final six months (Semester 10, also termed Senior Clerkship) of their five-year undergraduate course. The students were posted at Clinical School Batu Pahat for the entire Senior Clerkship Programme. There were 51 students in the first cohort (September 2004 to February 2005) and 65 in the second cohort (March to August 2005). In the second survey, there were modifications on the questionnaire in response to student, faculty and external feedback, as will be elaborated below and in the Results.

The questionnaire aims to assess student competencies based on elements of the eight IMU exit outcomes. It comprises the following items:

- i. 14 items with multiple responses examining self-perceived competencies as a house officer on common clinical tasks, including practical skills and ward routines, classified under the exit outcome, Clinical skills.
- ii. 15 items with multiple responses on the estimated number of common practical procedures performed throughout the students' undergraduate career.
- iii. Eight items with dichotomous responses (comfortable, uncomfortable) covering various important generic attributes relevant for a junior doctor, classified under Communication skills, Professionalism and personal development.
- iv. Two questions on the students' readiness to assume the role of a house officer, namely: the most daunting aspect anticipated on being a

Table II. The exit outcomes predominantly covered by the three major assessments in Semester 10 (Senior Clerkship), IMU.

Assessment	Grading	Exit outcomes covered
Community and family case study	Pass/fail	<ul style="list-style-type: none"> ♦ Community and family issues in healthcare ♦ The application of basic science in the practice of medicine ♦ Health promotion and disease prevention ♦ Communication skills ♦ Professionalism, ethics and personal development
In-course assessment (Logbook)	Scaled grading: 6 points in final grading (1 - incompetent to 6 - excellent)	<ul style="list-style-type: none"> ♦ The application of basic science in the practice of medicine ♦ Clinical skills ♦ Communication skills ♦ Self-directed life-long learning and information management ♦ Professionalism, ethics and personal development
Exit assessment (Portfolio grading and exit viva)	Global assessment (Unsatisfactory, borderline, satisfactory, excellent)	<ul style="list-style-type: none"> ♦ The application of basic science in the practice of medicine ♦ Clinical skills ♦ Communication skills ♦ Health promotion and disease prevention ♦ Self-directed life-long learning and information management ♦ Professionalism, ethics and personal development ♦ Critical thinking and research

house officer (multiple responses); and whether longer training would make them better prepared (dichotomous response: Yes or No).

- v. For the second cohort of students, four additional items that assess the information-seeking behaviour of the students and their practice in retrieving and appraising clinical evidence. These include the following: (a) the first and second sources of clinical information; (b) the frequency of accessing common online sources of clinical information; (c) the speed in tracing the abstract of an article of interest; and (d) confidence in critically appraising journal articles. These elements are grouped under Critical thinking and research in the IMU exit outcomes.

Data were collated and analysed, and charts were constructed, using Statistical Package for Social Sciences (SPSS) for Window version 11.0 (Chicago, IL, USA) and Microsoft Excel 2003.

RESULTS

There were 92 respondents in total. 42 out of 51 students (82%) from the first cohort, and 50 out of 65 (77%) from the second cohort, returned the questionnaire. The overall inter-rater reliability of the items in this questionnaire (95% CI of intraclass correlation coefficient) ranges from 0.86 to 0.94. Cronbach's α is 0.90.

For self-perceived competence on practical skills and ward routines, the students were asked to rate ten practical skills and four ward routines on a five-point scale. The scale was qualified with statements indicating various levels of competence, as follows:

1. Do not have a clue.
2. Know in theory but not confident at all in practice.
3. Know in theory, can perform some parts in practice independently, and needs supervision to be readily available.
4. Know in theory, confident in practice, need sources of supervision at least to be contactable.
5. Know in theory, competent in practice without any supervision.

With the exception of practical procedures in children and those performed rarely in this country like lumbar puncture, our senior students are expected to be competent at least at Level 3 in all other items. The majority rated three or four for both practical skills and ward routines, with the exception of procedures in children and lumbar puncture. Notably, around two-thirds of the students rated one or two for lumbar puncture (Table III).

For the estimated number of practical procedures performed, the numbers were grouped into a five-point scale, reflecting the spread of the frequencies

Table III. Distribution of self-perceived competence on practical skills and ward routines.

Practical skills (Exit outcome: clinical skills)	Number who responded	Mean rating	Standard deviation	Mode
Initiating resuscitation in hospital settings	90	3.31	0.77	3
Intravenous line insertion (adult)	91	4.14	0.69	4
Intravenous line insertion (child)	91	3.03	0.85	3
Blood taking (adult)	92	4.42	0.67	5
Blood taking (child)	92	3.38	0.97	3,4*
Assisting operations	91	3.49	0.75	3
Lumbar puncture	92	2.41	0.89	2
Administering intravenous medications	90	3.97	0.80	4
Administering intramuscular medications	89	4.12	0.82	4,5*
Administering per rectal medications	90	3.86	0.94	4
Prescribing intravenous fluids	91	3.54	0.86	3
Prescribing common medications	91	3.87	0.78	4
Handling blood containers (selecting appropriate tubes and labelling)	91	3.92	0.75	4
Ordering common radiological investigations (e.g. radiographs, computed tomography)**	50	4.00	0.76	4

* multiple modes exist

** item added for the second cohort

for undergraduate students in performing various common procedures, as follows:

1. None.
2. Between one and five times.
3. Between five and ten times.
4. Between ten and 20 times.
5. More than 20 times.

With the exception of practical procedures in children and those performed rarely in this country like lumbar puncture, our senior students are expected to have performed at least one to five times (Level 2) in all other items. The responses are shown in Table IV. There were variable response rates across the items. There was a wide range in the number of practical procedures performed, with the majority having performed between one and ten times.

The experience of lumbar puncture and giving PR medications was limited, as was that to procedures in children or neonates (Table IV).

For the generic attributes relevant for a junior doctor, students were asked to indicate whether they were comfortable or uncomfortable with the following generic tasks, which are classified under Communication skills, Professionalism and personal development in the exit outcomes. The responses are shown in Table V. Most students were comfortable with the generic tasks assessed. Coping with unexpected additional tasks and working independently away from home were identified as the tasks that most students were uncomfortable with.

For the readiness to assume the role of a house officer, firstly, the students were asked, from a series of statements, to identify the most daunting aspect of

Table IV. Estimated number of practical procedures performed throughout undergraduate training.

Practical procedures – estimated number performed (Exit outcome: clinical skills)	Number who responded	Mean rating	Standard deviation	Mode
Intravenous line insertion in adult	86	3.55	1.08	3
Intravenous line insertion in children/neonates	86	2.05	0.99	2
Blood taking in adult	86	4.52	0.78	5
Blood taking in children/neonates	85	2.39	1.04	2
Giving intravenous medication	84	2.70	1.05	2
Giving intramuscular medication	86	2.98	0.98	3
Giving per rectal medication	86	1.85	0.98	1
Assisting all operations	86	2.78	0.99	2
Lumbar puncture: assisting	86	1.51	0.63	1
Lumbar puncture: performing	86	1.08	0.28	1
Taking part in adult resuscitation	86	2.37	0.78	2
Taking part in paediatric/neonatal resuscitation	86	1.51	0.68	1
Urinary catheter insertion (male or female)**	50	2.90	1.00	2
Suturing (minor or major surgery)**	50	2.48	0.93	2
Conducting normal vaginal deliveries**	49	2.88	0.56	3

** items added for the second cohort

Table V. Responses to various important generic tasks.

Generic tasks	Comfortable	Uncomfortable
Referring to seniors	82/92 (89.1%)	10/92 (10.9%)
Functioning as a team member in coordinating work schedules	90/92 (97.8%)	2/92 (2.2%)
Independently finding out the routines in the ward	88/92 (95.7%)	4/92 (4.3%)
Handling advice and criticism from colleagues	84/92 (91.3%)	8/92 (8.7%)
Communicating to colleagues when opinions differ in patient management	82/92 (89.1%)	10/92 (10.9%)
Coping with unexpected additional tasks	75/92 (81.5%)	17/92 (18.5%)
Managing own time on and off work	82/91 (90.1%)	9/91 (9.9%)
Working independently away from home	79/92 (85.9%)	13/92 (14.1%)

being a house officer. They were instructed to mark only one statement. Additional space was provided if the students had identified issues not covered in the statements given. The statements could be classified under different aspects of the IMU exit outcomes, as shown below.

1. Physical demand: difficulty in maintaining patience (Professionalism).
2. Physical demand: difficulty in maintaining clinical judgment (Clinical skills).
3. Confronting the seniors (Professionalism).
4. Handling patients with responsibilities (including communication) (Communication skills, professionalism).
5. Competence required in knowledge and judgment (Clinical skills).
6. Competence required in practical skills (Clinical skills).
7. Time management (Personal development).
8. Having to adjust to different routines in work and in life (Personal development).

The responses are shown in Fig.1. There were no additional remarks other than the statements given as above. From the results, the demand for knowledge and judgment appear to be the aspect found most daunting by our students, followed by the prospect of having to adjust to different routines in work and in life, time management and the effects of physical demand on clinical judgment. When asked whether extending their training at the time of the survey would better prepare the students for their housemanship, out of 85 who responded for this item, 26 students (30.6%) answered “Yes” while 59 (69.4%) answered “No”.

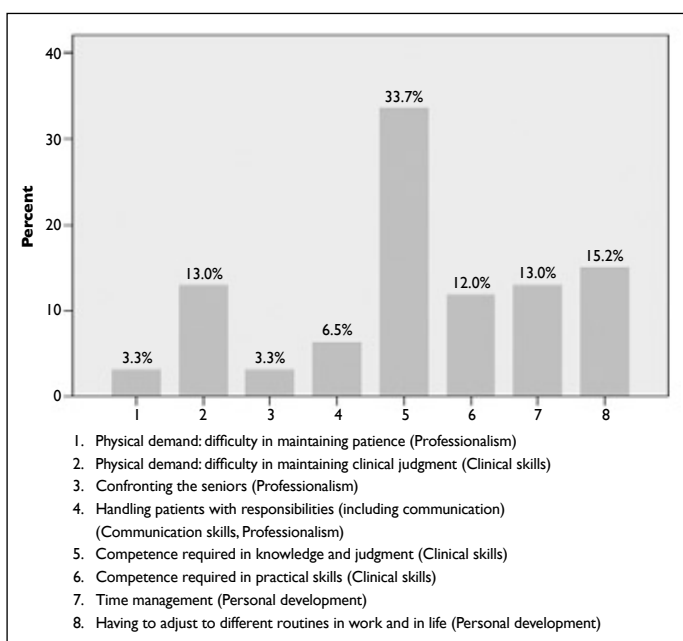


Fig. 1 The most daunting aspects of being a house officer (no. responded: 92).

For information-seeking behaviour of the students and their practice in retrieving and appraising clinical evidence, the students were asked to rank six sources of information according to the likelihood of being referred to when they had clinical queries. These included colleagues (friends, seniors, hospital staff and lecturers), textbooks, manuals (including on call guides or pocket guides), journal articles, internet documents (excluding journals) and keeping the queries to themselves. The responses were analysed and charted in Figs. 2 and 3. Fig. 2 illustrates the number who would refer to these sources as the first choice (i.e. Rank 1); while Fig. 3 shows the number who would refer to the sources as the second choice (i.e. Rank 2).

The majority of students referred first to their colleagues for clinical information (Fig. 2). The second sources of clinical information were more evenly spread (Fig. 3), with manuals being the most popular, followed by colleagues and textbooks. Overall analysis shows that other than two respondents who ranked “keeping to themselves” first, no one else ranked this option within the first three choices. This suggests that the vast majority of

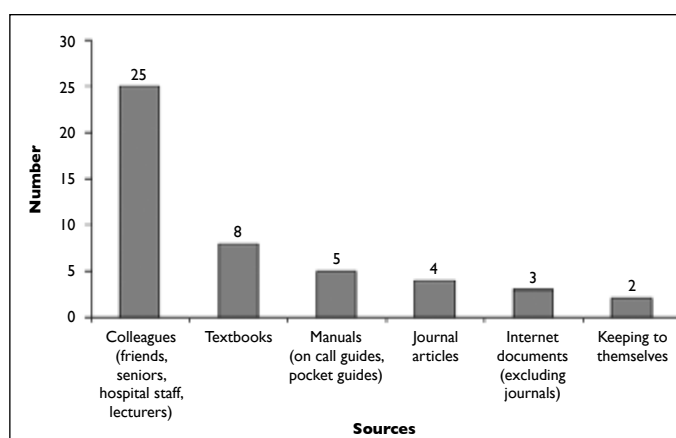


Fig. 2 The first sources of information in response to clinical queries (no. responded: 47).

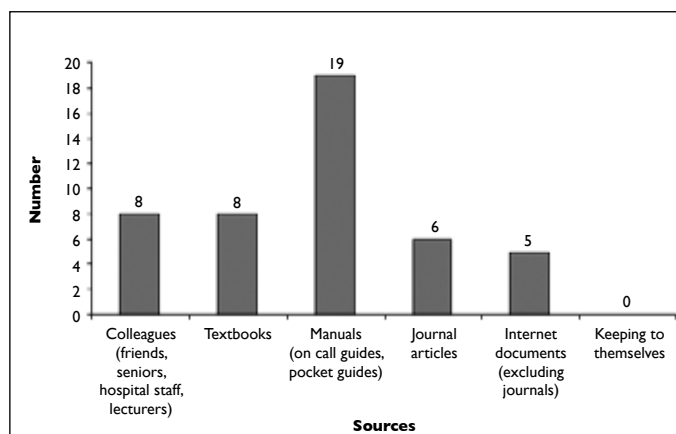


Fig. 3 The second sources of information in response to clinical queries (no. responded: 46).

the students used at least three external sources of information in response to their clinical queries.

The students were then asked to indicate how frequently they had been accessing various sources of clinical information since they commenced Semester 10. The frequencies were grouped into a five-point scale. The charted distribution of frequencies for each collection or journal were grouped. MEDLINE and individual journals, like New England Journal of Medicine and British Medical Journal, were accessed most often, with 60% of the students having referred to either source at least once a week (Fig. 4).

As there was limited library capacity at Clinical School Batu Pahat, especially for medical journals, the search for journal articles was usually performed online. The yield of their searches was mostly in the form of abstracts, as full text subscription to online journals, was also limited. Full text journals were procured from the library at Clinical School

Seremban (200 km away), with some delay before they reached the students. In this survey, the students were asked to indicate how long they took in general in their online searches to trace an abstract of a journal article of interest. The time intervals are divided into a five-point scale (Scale 1: could never trace, Scale 5: less than ten minutes). The majority of students were able to trace the abstracts of interest within one hour, although only six (12%) were able to complete their searches within ten minutes (Fig. 5).

For confidence in critically appraising research papers, in the Senior Clerkship programme, critical appraisal of research papers is taught during journal club sessions, with the aid of dedicated worksheets for different types of studies (e.g. therapy, prognosis, diagnosis). This forms part of the teaching in evidence-based medicine (EBM) and represents an element in the exit outcome of Critical thinking and research. The four statements on critical appraisal on which students were asked to rate themselves indicate various levels of confidence, from “Do not have a clue about critical appraisal” (Statement 1) to “Confident in appraising all common types of studies” (Statement 4). The responses are shown in Fig. 6. All students were

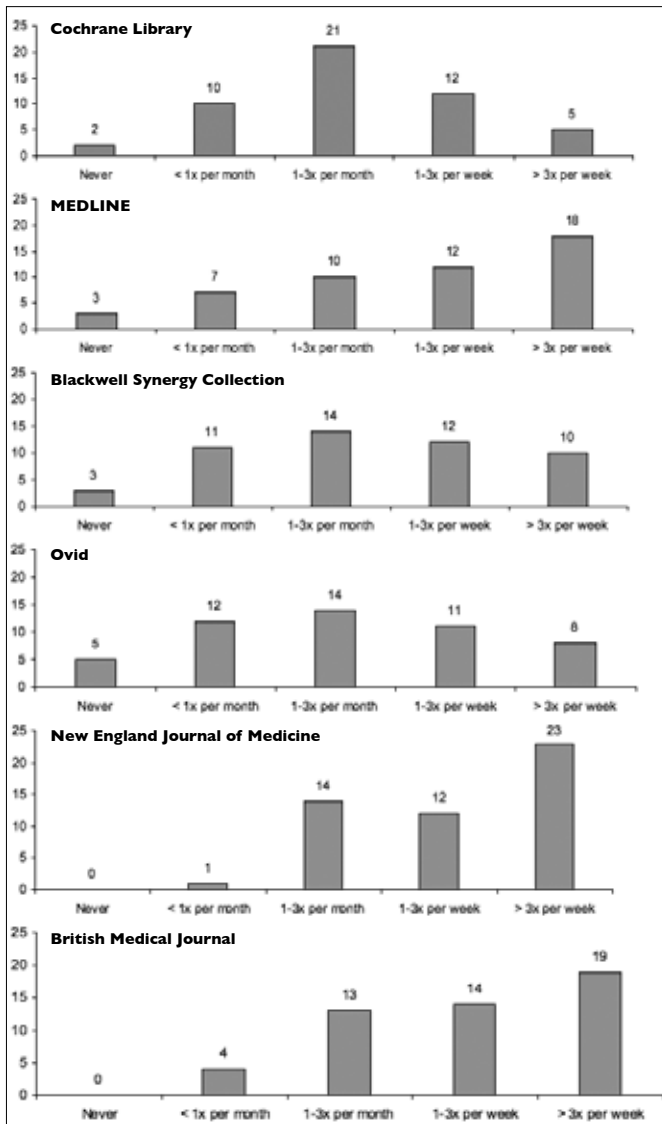


Fig. 4 The frequency in accessing various common sources of clinical information.

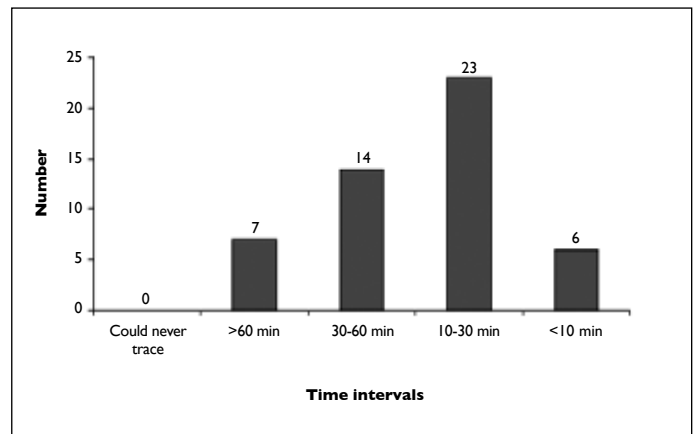


Fig. 5 Time taken by the students in retrieving the abstracts of interest (no. responded: 50).

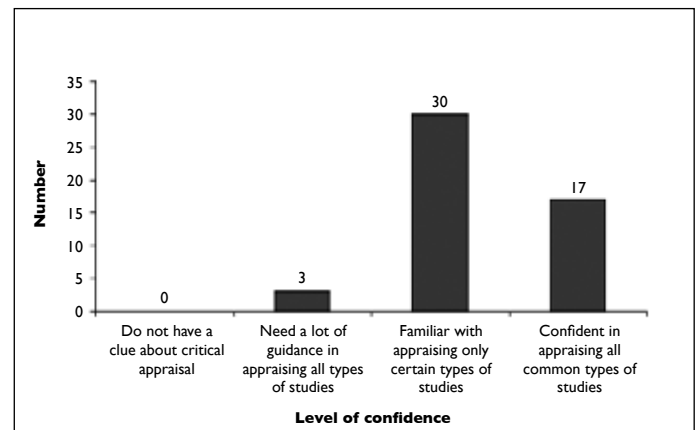


Fig. 6 The confidence of the students in critically appraising research papers (no. responded: 50).

able to perform critical appraisal to some extent. 94% were familiar with appraising at least certain types of studies, with one-third confident in appraising all common types of studies.

DISCUSSION

The value of outcome-based education did not receive its due recognition at the initial stage of its development. There had been criticisms that this educational approach encourages a rigid and narrow view of education, with limitations in creativity imposed on the teachers and the learners, among others⁽¹⁾. In addition, the development of a new curriculum with specification of the major outcomes and the learning objectives was an arduous task before the establishment of the international consensus guidelines, especially when it involved a change in the education pedagogy and the aged-old curriculum⁽¹³⁾. In Malaysia, this educational approach in Medicine is currently only adopted in newly established medical schools like IMU^(6,14). To demonstrate the effectiveness of this approach, it is important to assess its products on the attainment of various competencies according to the pre-specified outcomes. Logistically it is difficult to conduct a detailed survey on the working graduates from this university, as they are dispersed around different hospitals in the country and overseas. A fair reflection on the competencies of the graduates can be obtained from that of the students near the point of exit, as presented in this paper.

A set of consensus-based requirements for undergraduate students, including those on clinical skills, has been established as the global minimal essential requirements in medical education⁽⁹⁾. The learning objectives developed by IMU under the eight exit outcomes are in line with these requirements⁽⁶⁾. However, within these broadly-defined learning objectives, the expected proficiency in each practical procedure is not explicitly stated. We therefore do not have an established yardstick to measure against in terms of student competencies in practical procedures. Setting specific requirements on practical procedures in a curriculum is problematic, and it has been shown that in many institutions, the amount of emphasis on clinical skills and teaching do not match the requirements⁽¹⁵⁾. This is attributed to the wide variations in the settings where clinical learning takes place, with variable opportunities for a student to acquire these practical skills⁽¹⁶⁾. In addition, studies performed on undergraduate students fail to show good correlation between experience in such skills and competence at the end of their training^(17,18). In this study, the standards on practical skills are set

from our experience of what an average student in IMU can realistically achieve, taking into account the opportunities in different clinics and hospitals that the students are attached to in their clinical years.

We found that the level of competencies for our students in general met the expected standards. The majority was confident in performing practical procedures and ward routines, with reports of adequate exposure during their undergraduate training, except for rarer procedures like administering PR medications, lumbar puncture and paediatric procedures. Although the students' limitations in the proficiency of these procedures are understandable, it is important that they are familiar with the theoretical aspects and have observed them being performed before their internship. One way to achieve this, in the face of limited real-life exposure, is to introduce video recordings of these procedures with relevant instructions, to consolidate what have been learnt on models in the Clinical Skills Unit during the students' earlier training.

Apart from the obvious deficiencies stated above, the students' relative lack of confidence in prescribing intravenous fluid raises some concern, as this is part of daily ward routines that can easily be learnt by following and observing the resident doctors. The finding suggests that the students' focus in the ward might be the acquisition of medical knowledge by following rounds and seeing patients, instead of observing and assisting in daily routines like writing drug and fluid prescriptions. The familiarity to these routines is purported as the emphasis of the Senior Clerkship programme. It would make a significant difference to the confidence of a new intern, and should be enforced in each posting through dedicated sessions, for example, on mock prescription.

The students showed that they were mostly comfortable with the generic tasks that required personal skills and professionalism, and were on the whole ready to function as interns. However, one-third claimed that extending their training at the time of survey would make them better prepared, while two-thirds thought that they were as ready as they could be. Some pointers could be derived from the survey, where "coping with unexpected additional tasks" and "working independently away from home" were identified as the tasks that the students were least comfortable with. It is obvious that these skills could only be scrutinised and further developed through actual work experiences, and are therefore unlikely to be improved by longer periods of undergraduate training. Next, the majority of the students chose "competence required in knowledge and judgment" over others like physical demand as

the most daunting aspect of internship. This reflects their maturity and the priority they place on clinical skills and judgment in patient care. Interpreted together with the findings on practical skills, ward routines and generic attributes, it could be summarised that overall the students were satisfied with their own level of clinical skills, communication skills and professionalism, but they remained tentative on the amount of knowledge and skills required to handle the demands of internship.

Under the major outcome of critical thinking and research, the students' information seeking pattern and ability to retrieve information from relevant sources were evaluated. The results suggest that they were flexible enough to refer to a variety of sources in search of the answers to their clinical queries. Very few preferred to keep the queries to themselves, and none limited their resources to only their colleagues and lecturers. This is encouraging, and suggests that the students do not rely solely on personal opinions to guide practice. Instead, they were aware of the importance of independent learning from the original sources of clinical information.

In Semester 10 at IMU, the five-step process of EBM is learnt, from generating answerable clinical queries at the bedside to critically appraising relevant evidence in journal club, and incorporating the newly appraised clinical information into the subsequent care of the patients⁽¹⁹⁾. The students are expected as their exit requirements to show awareness and competence in the practice of EBM, and have elements of EBM incorporated as learning issues in at least five out of their 14 portfolios. In this survey, the students accessed sources of clinical information regularly, although they tended to perform searches on single journals rather than clinical databases or collections (e.g. MEDLINE or The Cochrane Library). Their confidence on critical appraisal was encouraging, but this was not matched by their efficiency in information retrieval, as over 40% of the students took 30 minutes or longer to trace an abstract of interest.

In IMU, formal training sessions on online search of clinical database had been conducted in the early stage of Phase II training. It is clear that this should be reinforced in Semester 10, when it is perceived to be more relevant. The students should also be introduced to common sources of clinical databases or collections to increase the pool of clinical resources that they could access. This could increase their search efficiency and interest. Apart from search techniques which should improve with hands-on practice, clinical experience is also a limiting factor in search efficiency. With increased

clinical experience, appropriate search keywords would be formulated more easily. As such, while it is reasonable to aim for a search time of less than 30 minutes, it may not be realistic to set any higher expectation for undergraduate students who have limited clinical experience.

In general, the results of this study substantiate the impression and the evaluation of the faculty through logbook assessment, used as the tool for our in-course assessment in Semester 10. The findings confirm the value of this curriculum in its ability to produce competent future doctors with good clinical skills, communication skills and level of professionalism, who are aware of the broader context of healthcare, with insights into their strengths and deficiencies, and with realistic expectations of their work ahead. In addition, they are equipped with awareness and basic skills in practising EBM. This report serves as a template for improving the delivery of teaching, and forms part of an ongoing survey on students to evaluate their competency profiles. It is expected that the delivery of the curriculum and the assessment of competencies in IMU will undergo further fine-tuning, when the assessment of generic attributes like professionalism is made more explicit⁽²⁰⁾, and the assessment of the knowledge and application of EBM is conducted through more objective tools. The challenge remains in determining whether the impact of the learning outcomes followed at the undergraduate level will persist well into the practice lives of the graduates and influence their long-term professional behaviour.

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2007 INTAKE

CERTIFICATE AND DIPLOMA COURSES & MASTERS DEGREE
FROM EDITH COWAN UNIVERSITY, WESTERN AUSTRALIA IN
COLLABORATION WITH METHUSELAH MEN'S HEALTH CENTRE
GLENEAGLES HOSPITAL, SINGAPORE



Aims

- To give students an advanced and contemporary understanding of Andrology and Men's Health in the Singapore-Asia-Pacific Region
- To give students an opportunity to enhance their holistic understanding and clinical skills in managing infertile and impotent men, those afflicted with degenerative / oncologic and other diseases peculiar to men including preventative and intervention approaches in the aging process in men
- To equip the student with advanced clinical and psychosocial skills in the field of Andrology and Men's Health
- To give the student an opportunity to examine and develop best practice models of diagnosis, evaluation, intervention and follow-up strategies
- To give students an opportunity to enhance their interpersonal skills with men in a clinical setting

CERTIFICATE IN ANDROLOGY & AGING SCIENCE

Certificate in Andrology & Aging Science will be offered by Methuselah Centre in Singapore. Students have to complete 3 units and after a qualifying exit examination, it leads to an award of the Certificate which gives exemptions to 50% of the ECU Diploma Course. The Certificate is a stand alone certificate by itself and is wholly administered in Singapore.

Fees in Australian Dollars: \$1,200 per unit

DIPLOMA IN ANDROLOGY & MEN'S HEALTH

Upon completing another 3 units via on-line distance education, the student obtains the Diploma after satisfactory completing relevant assignments from Edith Cowan University. Diploma Course has a clinical component for registered medical practitioners only.

Fees in Australian Dollars: \$1,400 per unit

MASTER IN MEN'S HEALTH & ANDROLOGY

Additional 3 units can be offered to graduates of the Diploma which when completed will lead to a Master of Men's Health & Andrology via on-line distance education.

Fees in Australian Dollars: \$1,800 per unit

- Edith Cowan University (ECU) has signed a Memorandum of Understanding with the Methuselah Centre
- No other University in Australia or the Asia-Pacific Region teaches in these areas of Men's Health studies and Andrology

If interested, please contact us by providing name, profession, contact address and email address

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