Chapter Three

Suggestion of General Frameworks for Curricula and Study Plans

Introduction

The AAFAQ project aims at the advancement of the efficiency of higher education system through the preparation of a long-term, practical, ambitious and futuristic plan with a clear mission for next 25 years. This plan includes an assembly of effective values and scientific criteria for the assessment of achievements and delineating the requirements of the higher education system with its patterns, quality of outcomes and methods of funding. Within the tracks of this project is the conduction of a technical study about health colleges' education aiming at establishing a long-term strategic plan for the development of undergraduate health colleges education at all levels. The critical track is the suggestion of general frameworks for study plans that comply with the market needs and development plans. To achieve this objective, the specification and capabilities (knowledge, skills and directions) that the graduate of health colleges [medicine, dentistry, pharmacy, nursing and applied medical sciences (e.g. optometry and physiotherapy were selected as examples)] should master were delineated. This was specified for each specialty according to the most recent studies and international recommendations, with a full description of basic and essential skills that the graduate should master to be able to carry out what is required from him. Consequently, this will be an important factor for what the study plans should be, in order to suit the desirable outcomes of these colleges.

During the study of the general frameworks of the study plans, the study team has not neglected two important cornerstones in the educational and clinical processes, namely, the students and patients. Studies were conducted using the Dundee Ready Education Environment Measure (DREEM) to measure the educational environment. The survey was distributed to male and female students of health colleges in various

educational levels to get their perception of the educational environment which includes (teachers, teaching methods and in-class and out-class educational environment). The questionnaires were collected later and analyzed using established statistical techniques. In regard to patients, the study team designed structured questionnaires which were distributed to outpatients in King Khalid University Hospital (KKUH), College of dentistry and College of Pharmacy at King Saud University. The aim of these questionnaires was to assess the patients' satisfaction of their physicians, pharmacists, physiotherapists and the nursing staff, and the characteristics that the patients expect to see in these professionals. The questionnaires were collected and statistically analyzed.

During the study, the admission procedures and conditions were touched upon, and the help of some special reports about the admission in health colleges in the United Kingdom and the United States of America was sought where the criteria and conditions for students' admission in these colleges were reviewed. In addition, the help of one of the specialists in electronics methods of teaching was sought to review the new techniques and methods of education including e-learning and its various types, electronic book, multimedia used in modern education, tele-education and whatever that should be made available such as the so-called virtual education.

Finally, through reviewing the literature related to this issue, a detailed conception about the fundamental contents of any curriculum and effective health education strategies was made[1].

[1] References of Introduction:

- Towards a future strategy to provide the best health services to growing population of the Kingdom. A study by: Dr. Abdulrahman Bin Hamad Al-Homaidhi, 1423 H.
- Human development report issued by the Ministry of Economy and Planning (1423 H/1424 H – 2003 G) – Future vision of the higher education in the 8th development plan of the Ministry of Economy and Planning.
- Ways to increase the capacity of enrollment to face the requirements of future development. A paper presented in "The future vision of the Saudi economy in 1440 symposium", Ministry of Planning (13-17/8/1423 H).
- The present-day situation of health workforce and trends of the future. Dr. Othman Bin Abdulaziz Al-Rabeaa. A paper presented in the 4th Gulf medical Societies, 1426 H (12-14/3/2005).

Objectives of the Study

1. Suggestion of general frameworks for study plans and curricula in a way that conform to the modern trends in medical and health related education.
2. Promoting the level of competency of undergraduate health education institutions through the study of students' educational environment and the suggestion of appropriate solutions.
3. Delineating the professional competencies, characteristics and attitudes that the health colleges' graduate should have.
4. Description of policies and mechanisms of admission in health colleges and comparing them with the experiences of some developed countries and the results of scientific research. Also suggesting new effective policies for admission regulations and capacity in health colleges.

Procedures

1. Brainstorming sessions were held at the beginning of study planning in order to specify and clarify the study items and the best methods to achieve its objectives, and to distribute responsibilities.
2. Reviewing the most important literature, references and refereed journal articles that could serve the study was conducted. Also an internet search of some universities, professional organizations and scientific journals' websites was performed. The official statistics and future perspectives of the development plans in the kingdom were also reviewed to make use of them in devising the methodology of study plans.

3. Weekly workshops were held where three consultants were invited depending on their interest and capabilities. Their contribution was evident in the success of committee's task.
4. The help of the expertise of some specialists in issues that contribute to the accomplishment of the work was sought. Professor Jamal Al-Sharhan assisted in writing methods and styles of electronic education and e-learning, Dr. Abulmonem Al-Hayyani reviewed the characteristics and capabilities of the health practitioner, Dr. Hamza AbdulGhani reviewed the literature related to admission in health colleges and the specifications of skills laboratory and Dr. Mohammad Mahdi Belah assisted in the study of future plans of health education and the characteristics of future physician. Finally it was benefited from the expertise of Prof. Ashry Gad Mohammad and Dr. Noura Al-Rowais in the analysis of field study results.
5. Field visits to some authorized personalities such as the visit to the Dean of the College of Pharmacy, the man-in-charge of admission program in health colleges at King Saud University.
6. Two survey studies were conducted to achieve the track's objectives, namely, the study of educational environment of health colleges at King Saud University and the survey of patients' opinions about the performance and characteristics of the health practitioner.

The Cross Sectional Studies

First study: Educational environment of health colleges at King Saud University:

Objectives of the study:

The study aims at investigating the health college's students' perception of educational environment in their colleges and the assessment of their satisfaction about them.

Methodology:

A cross-sectional survey conducted in five health colleges, namely, colleges of medicine, dentistry, pharmacy applied medical sciences and nursing, at King Saud University. The study included a random sample of male and female students drawn in April and May 2006. The Dundee Ready Education Environment Measure (DREEM) prepared by the Medical Education Center at Dundee University in Scotland[1] was used to study the educational environment. The measure is composed of 50 items and the answers are ranging between (Strongly disagree =0) and (Strongly agree =4). The research team translated the measure into Arabic and a pilot study was conducted to verify that the translation fits the measure items (refer to Appendix 1), and a supporting team collected students' data through a self-administered questionnaire.

The questionnaires were manually checked prior to feeding into computer to verify correctness and completeness. The data were fed into computer and analyzed using the Statistical Package for Social Sciences (SPSS). The data were presented as tables including the arithmetic mean, the standard deviation and percentages. The variables forming each of DREEM domains were pooled and compared, in addition to the

[1] Association of Medical Education in Europe. Curriculum, environment, climate, quality and change in medical education: a unifying perspective. AMEE Medical Education Guide No 23: Lynn Bell, 2001

variables between colleges that were also included in the study. The one-way analysis of variance (ANOVA) was used to test the statistical significance of the difference between colleges as well as between sexes at a significance level of 5%. Also, the educational environment inside each individual college was studied using ANOVA and Chi square tests.

According to the recommendations of the measure inventors, the arithmetic mean was interpreted as follows:

(a) The sum of educational environment score:

- Poor educational environment: if the result score was between 0-50.
- Educational environment with Multiple-problems: if the result score was 51-100.
- Educational environment with positive aspects more than negative aspects: if the result score was 101-150.
- Excellent educational environment: if the result score was 151-200.

(b) The score of each domain of the educational environment domains:

Students' perception of learning (maximum =48)

- 0-12 = very poor
- 13-24 = negative perception of teaching
- 25-36 = more positive perception
- 37-48 = good perception of teaching

Students' perception of teachers (maximum =44)

- 0-11 = No benefit out of him
- 12-22 = Needs some training

- 23-33 = Moves in the right direction
- 34-44 = Ideal teacher

Students' academic self perceptions (maximum = 32)

- 0-8 = complete failure
- 9-16 = lots of negative aspects
- 17-24 = leaning toward positive perception
- 25-32 = confident

Students' perception of educational atmosphere (maximum = 48)

- 0-12 = poor atmosphere
- 13-24 = many aspects need to be changed
- 25-36 = more positive atmosphere
- 37-48 = good perception

Students' social self perception (maximum = 28)

- 0-7 = pitiful
- 8-14 = not a nice place
- 15-21 = not bad
- 22-28 = very good socially

(c) Scores of each domain of the educational environment domains:

- Domains with an arithmetic mean of 3.5 or more = positive.
- Domains with an arithmetic mean of 2.1-3.4 = need support.
- Domains with an arithmetic mean of 2 or less = need revision and study.

Results:[1]

The study was conducted on a sample of 505 male and female students at the Colleges of Medicine, Dentistry, Pharmacy, Applied Medical Sciences and Nursing. The age of participants averaged 21.85±1.77 years (mean ± SD), and the percentage of males was 57.1% (Table 3-1).

In studying the educational environment of health colleges, it appeared that the collective score for all health colleges was (100.1 points = positives more than negatives), whereas the score for the College of Medicine was (88.5 points = many problems), the College of Dentistry (97.5 points =many problems), the College of Pharmacy (108.8 points = positives more than negatives), the College of Applied Medical Sciences (106.9 points = positives more than negatives) and the College of Nursing (113.3 points = positives more than negatives).

The study revealed that students' perception of the educational environment in all colleges was as follows:

1. Perception of learning: (21.8 out of 48 = learning is seen as negative).
2. Perception of teachers: (22.9 out of 44 = teachers need more training).
3. Academic self perception: (18.5 0ut of 32 = positive perception).
4. Perception of educational atmosphere: (23 out of 48 = many aspects need to be changes).
5. Social self perception: (15.1 out of 28 = not bad).

It was evident that the College of Nursing was the best college among all investigated colleges in terms of learning (26.8), the level of teachers (24.2) and social

[1] The details of the results can be found in Appendix 3.

aspects (16.3), whereas the College of Applied Medical Sciences was the best regarding the students' academic self perception (20.1). On the other hand, the College of Pharmacy was the best among all colleges in terms of educational atmosphere (25.5) (Table 3-2).

The comparison between male and female students in all colleges revealed that the assessment of College of Applied Medical Sciences' male students was significantly ($p=0.001$) less than that of female students (93.3 for males and 118.9 for females). Although the collective assessment of educational environment for female students in all colleges was slightly better than male students, the difference between them did not reach a statistical significance ($p=0.056$) (Table 3-3).

It is noteworthy to list some of the elements criticized by the students in all 5 domains[1]:

1. The most important criticism of the educational environment in the learning domain was that the learning is not motivating to the students (71.4%) and learning does not emphasize and induce active learning (61.5%).
2. Regarding the teachers' domain, the most severe criticism was that the teachers do not provide the students with feedback about their academic performance (53.3%), and the teachers get angry in the class (59.5%).
3. Concerning the student's academic self perception, the most grueling self criticism was the inability to memorize all what they are supposed to memorize (58.6%) and unsuitability of past educational strategies to be applied in the current year (45.3%).
4. In the educational atmosphere, the most observed difficulties by students were that stress overwhelmed their enjoyment of courses (61.6%), the general

[1] To whom interested to learn more, it is advisable to refer to Table 5-9 in the Appendix.

atmosphere does not encourage learning (61.4%) and the inability to ask all what they need to ask about (60.8%).

5. When dealing with the student's social self perception, it was evident that the students were suffering the most from the nonexistence of a support and assistance system when various stresses occur (81.8%) and the feeling of boredom of courses (72.8%).

In comparing the educational environment at King Saud University with that at King Abdulaziz and Umm Al-Qura universities (Table 3-4), the close similarity was evident in these national universities, but the difference in educational environment was statistically significant in all domains between national universities and Dundee University in Scotland.

Most Important Results:

It is imperative to point out that the study was about the conviction and satisfaction of the students, therefore, the results should be looked at as dependent on the eagerness and expectations of currently enrolled students. Also the main objective of conducting this study was to be an indicator for the points of strengths and weaknesses in the educational environment to urge the college administrators to review the results and to speculate the causes and remedial methods.

Since the nature of the questionnaire gives the opportunity to determine the scores and the performance of each domain, this will facilitate the diagnosis of defects as will be shown in the paragraph below. Collectively, this study reflects the following most important observations:

1. The educational environment in the health related colleges at King Saud University and some other Saudi universities is below the expectations and less than what is supposed to be as compared with some developed countries.
2. There is variability – not big – in paying attention for the educational environment.
3. The female students are more satisfied of their colleges compared with male students.
4. The learning and the teachers' domains are the most frequently criticized among the educational environment domains.

Recommendation:

- It is important to pay attention for the various domains of the educational environment.
- Emphasizing the learning domain through the encouragement of the students for participation and active learning, finding suitable means to acquaint the students with the objectives and the syllabi of courses, and emphasizing the importance of long-term learning.
- Taking care of qualifying teachers scientifically and professionally, intensifying the concepts of patience, tolerance and forbearance among them, and equipping them with communication skills, good preparation and effective presentation skills.
- Fostering confidence and appropriate and effective compassion to the profession among students and perpetually tying them up with their future and specialty.
- Furnishing the appropriate scientific and social atmosphere at the campus and the students' housing to allow the feeling of comfort and enjoyment to prevail during their study.

- Establishing a system for support and assistance for students subjected to various stressors and enhancing the role of academic advising.
- Furnishing appropriate facilities for students to practice social and sports' activities to develop their skills, interests and hobbies.

Table 3-1: Demographic and educational characteristics of the participants in health related Colleges, King Saud University, 2006.

Characteristics	Frequency	Percentage
Colleges		
Medicine	156	30.8
Dentistry	110	21.7
Pharmacy	87	17.2
Applied Medical	77	15.2
Nursing	75	14.8
Sex		
Male	288	57.1
Female	216	42.9
Academic Level		
First	64	12.8
Second	118	23.6
Third	62	12.4
Fourth	134	26.8
Fifth	82	16.4
Sixth	40	8.0
Age		
Mean (standard deviation)	21.85	(1.77)

Table 3-2: Mean and Standard deviation of total DREEM score and its domains in health-related colleges, King Saud University, 2006.

College / Domain	Maximum total score	Medicine	Dentistry	Pharmacy	Applied Medical	Nursing	Total
Learning	48	17.1 (7.5)	21.9 (7.7)	23.2 (8.4)	24.9 (8.9)	26.8 (8.3)	21.8 (8.7)
Teachers	44	22.5 (6.9)	21.8 (6.6)	23.7 (7.1)	23.2 (7.3)	24.2 (7.1)	22.9 (6.9)
Self perception	32	16.0 (5.0)	19.0 (4.4)	19.8 (4.9)	20.1 (5.3)	19.7 (4.7)	18.5 (5.1)
Atmosphere	48	20.3 (8.6)	22 (7.3)	25.5 (8)	25.1 (7.5)	24.7 (8.3)	23 (8.3)
Social	28	14.4 (3.8)	13.8 (4.1)	16.2 (3.9)	16.1 (4.6)	16.3 (3.9)	15.1 (4.2)
Total	200	88.5 (25.4)	97.5 (24.9)	108.8 (26.4)	106.9 (28.3)	113.3 (27.0)	100.1 (27.6)

Table 3-3: Descriptive statistics (Mean and Standard deviation) of total DREEM score according to College and sex, King Saud University, 2006.

College	Male	Female	P-value
Medicine	87.6 (24.1)	90.8 (27.4)	0.52
Dentistry	96.9 (24.1)	98.1 (26.0)	0.83
Pharmacy	108.0 (25.2)	110.1 (28.7)	0.74
Applied Medical	93.3 (27.8)	118.9 (23.3)	0.001
Nursing	114.9 (22.2)	111.4 (32.5)	0.686
Total	97.7 (26.2)	103.3 (29.1)	0.056

Table 3-4: Domain scores for medical schools in King Abdul Aziz University (KAU), Umm Al-Qura University (UQU), King Saud University (KSU and Dundee University (DU)**.

Domains	KAU	UQU	KSU	DU
Learning's perceptions	23 *	25 *	21.8 *	34
Teaching's perceptions	23 *	24 *	22.9 *	29
Academic self-perceptions	17 *	18 *	18.5 *	23
Perceptions of atmosphere	23 *	25 *	23 *	35
Social self-perceptions	14 *	15 *	15.1*	20
Total	102	107	100.1	139

* Statistically significant compared to Dundee University.

** Adapted from: Al-Hazimi A, Zaini R, Al-Hyiani A, Hassan N, Gunaid A, Ponnamperuma G, Karunathilake I, Roff S, McAleer S, Davis M. Educational Environment in Traditional and Innovative Medical Schools: A Study in Four Undergraduate Medical Schools. Education for Health; 17(2):192-203.

Second study: Patients' perception on health practitioner's performance:

Objectives of the study:

The study aims at delineating the professional and attitudinal characteristics that the patients prefer in health practitioners as well as the assessment of the way in which the health practitioner deals with them.

Methodology:

A cross-sectional survey was conducted in the months of Rabi I and Rabi II, 1427 (April and May 2006). The study team designed structured questionnaires for this purpose through reviewing previous related literature and studies. The study was then divided into several domains:

- Patients' perception of the performance and characteristics of the physician.
- Patients' perception of the performance and characteristics of the dentist.
- Patients' perception of the performance and characteristics of the pharmacist.
- Patients' perception of the performance and characteristics of the nurse.
- Patients' perception of the performance and characteristics of the physiotherapist.

The questionnaire of each part was reviewed by specialists in the same field to suggest the necessary modifications, then a pilot study was conducted on a sample of 45 patients and the final modification were instituted (refer to Appendix 2).

The study team trained 5 assistants about data collection and interviewing skills. The data collectors interviewed patients treated by the health practitioners after the treatment session at King Khalid University Hospital and the College of dentistry in King Saud University.

After collection, the questionnaires were reviewed, fed into computer and analyzed using the Statistical Package for Social Sciences (SPSS) software and utilizing Chi-square test to determine the association between various variables at the 5% significance level.

Results:[1]

The study sample comprised 500 patients; equally distributed over the following categories of the health care providers (physicians, dentists, pharmacists, physiotherapists, nurses) at KSU hospitals. Some of the studied population socio-demographic characteristics were shown (Table 3-5). The majority was Saudi nationals (95.33%), equally divided between males and females, and 42.58% of them received post-secondary school education. The mean age of the study sample was 39.88±3.7 years, with a range of 15-95 years.

When asked on the most important five characteristics of their health care providers the following results were found:

The characteristics of the ideal physician most frequently mentioned by the patients were long experience (47.5%), smiling and friendly (43.4%), sympathetic (40.4%), not hurried (36.4%), and explaining patient's problem (35.4) (Table 3-6). A significant difference appears between men and women in their views, with more women requesting these attributes: listening (51.1% of women, 14% of men), answering patients' questions (44.8% of women, 18% of men) and taking care of psychosocial aspects (36.7% of women, 16% of men). However, more men mentioned requesting investigation according to case as an ideal characteristic (44% of men, 20.4% of women). When the relationship between patient's age and his/her views about the

[1] The details of the results can be found in Appendix 4.

characteristics of ideal physician was studied, there was no significant relationship except for sympathy which was valued more by the elderly (53%) then the young (26%).

The characteristics of the ideal dentist most frequently mentioned differ slightly from those reported for the physician. The ideal dentist in the patients' view should have the following characteristics being not hurried (52.4%), smiling and friendly (52.4%), examines well (49.5%), with long experience (49.5%) and explains the problem (46.6%) (Table 3-6). The only significant difference between the male and female patients was examining well (58.8% of men, 38.8% of women). In contrast to physicians, more younger population (55%) chose sympathy as a characteristic of the ideal dentist than the older (24.4%). Older population found these characteristics important: long experience, examining well, and requesting investigations according to case.

In their view of the ideal pharmacists, patients frequently mentioned respectful to his patients (50%), explaining how to use the medicine (50%), Arabic speaking (41%) and smiling and friendly (40%) (Table 3-6). Men were significantly different from women in their preference of Arabic speaking pharmacists (51% of men, 30.6% of women), and explaining how to use the medicine (63.3% of men, 38.8% of women). However, more females mentioned listening (53% of women, 20.4% of men) and taking care of psychosocial aspects (47% of women, 26.5%) as characteristics of the ideal pharmacist. Patient’s age was not significantly related to the required characteristics of the ideal pharmacist.

The ideal physiotherapist should have the following characteristics according to the studied sample: long experience (49%), respectful (41.8%), sympathetic (40.8%) Saudi national (38.8%) and not hurried (37.8%) (Table 3-6). When the patient’s age was

studied, the only significant difference between older and younger individuals was the preference of Saudi physiotherapist (48% of old, 28.6% of young). Female patients selected the following characteristics more frequently than their male counterparts:- sympathetic (52.1% of women, 30% of men), smiling (39.6% of women, 14% of men) and explains how to do the exercises (45.8% of women, 16% of men). On the other hand, men chose the following characteristics in their ideal physiotherapist: Saudi national (52 % of men, 25% of women), with long experience (60% of men, 37.5% of women), and organized (32% of men, 8.3% of women).

Most patients preferred that their nurse is smiling and friendly (60%), taking care of psychosocial aspects (43%), and respectful (41%) (Table 3-6). The only significant difference between old and young individuals studied was the preference of a nurse with long experience (31% of young, 13.6% of old), and a smiling nurse (51% of young, 70.5% of old).

The preference of a health care provider of the same sex was always a significant finding. 50% of female patients considered a physician of the same sex as one of the most important five characteristics of the ideal doctor, about 60% found that an attribute of the ideal nurse and physiotherapist, and only 34.7% and 28.6% chose that as a characteristic of the ideal pharmacist and dentist respectively. About 25% of the male patients selected a health care provider of the same sex as a characteristic of the ideal physician and dentist.

When the patients' level of satisfaction with their most recent encounter with health care providers studied, the majority of the patients were either very satisfied or satisfied (Table 3-7). Only 65% of the patients were satisfied with their pharmacists compared to physiotherapists (94%), nurses (93%), physicians (90%), and dentists (86%).

A large proportion of patients agreed that their last physician was respectful, well-dressed, Arabic speaking and organized (Table 3-8). However, only 62.22% of them reported that the physician prescribed medicine according to case, not looking at them when they talked (42%), and was in a hurry (31%). Patients also found their last dentist respectful, well-dressed, and good listener (Table 3-8). One third of the patients reported that their dentists were in hurry with no eye contact.

The majority of the patients also found their health care providers (pharmacists, physiotherapists, nurse) well-dressed, respectful, Arabic speaking, good listeners, and answering their questions (Table 3-9). Compared to physiotherapists and nurses, pharmacists were more frequently criticized by their patients in their organization, reaction to the patients' problems, answering their question and consideration of the psychosocial aspects. Only 57.14% of the patients found their pharmacists smiling, and reported that they were in a hurry (43.53%). Only one third of the patients said that their pharmacist asked about the disease to confirm the medicine and gave extra information without asking.

Table 3-5: Socio-demographic characteristics of the patients attending KSU hospitals study during Rabi I and Rabi II 1427 H

Characteristic	Categories	No. (%)
Sex	Male	250 (50.50)
	Female	245 (49.50)
Nationality	Saudi	469 (95.33)
	Non-Saudi	23 (4.67)
Education Level	Doctorate Degree	12 (2.54)
	Master Degree	7 (1.48)
	Bachelor Degree	182 (38.56)
	Secondary	132 (27.97)
	Intermediate	49 (10.38)
	Primary	28 (5.93)
	Uncompleted Primary	15 (3.18)
	Read and Write	7 (1.48)
	Read and Can't Write	6 (1.27)
	Illiterate	34 (7.26)

Age	≤ 25 yrs	73 (14.91)
	26 ~ 35 yrs	141 (28.78)
	36 ~ 45 yrs	129 (26.33)
	≥ 46 yrs	147 (30.00)

Table 3-6: The most important five characteristics of the ideal health care provider in the patients' view at KSU hospitals study (1427 H-2007 G)

Characteristics	No. (%)
Physician:	
1. Has long experience	47 (47.5)
2. Smiling and Friendly	43 (43.4)
3. Sympathizes with patients	40 (40.4)
4. Not hurried	36 (36.4)
5. Explains patients' problem	35 (35.4)
Dentist:	
1. Not hurried	54 (52.4)
2. Smiling and Friendly	54 (52.4)
3. Examines his patient well	51 (49.5)
4. Has long experience	51 (49.5)
5. Explains patients' problem	48 (46.6)
6. Respects her patients	47 (45.6)
Pharmacist:	
1. Respects his patients	50 (50)
2. Explains how to use the medicine	50 (50)
3. Speaks Arabic	41 (41)
4. Smiling and Friendly	40 (40)
5. Listens to his patients	36 (36)
6. Takes care of psychosocial aspects	36 (36)
Physiotherapist:	
1. Has long experience	48 (49.0)
2. Respects her patients	41 (41.8)
3. Sympathize with her patients	40 (40.8)
4. To be Saudi	38 (38.8)
5. Not hurried	37 (37.8)
Nurse:	
1. Smiling and Friendly	60 (60)
2. Takes care of psychosocial aspects	43 (43)
3. Respects his patients	41 (41)
4. To be Saudi	37 (37)
5 Sympathizes with you	37 (37)
6. Speaks Arabic	36 (36)

Table 3-7: Patients' satisfaction with their most recent encounter with health care providers at KSU hospitals study (1427 H-2007 G)

Level	Physicians No. (%)	Dentists No. (%)	Pharmacists No. (%)	Physiotherapists No. (%)	Nurses No. (%)
Very Satisfied	55 (56.1)	53 (55.8)	14 (14.14)	56 (57.14)	42 (42)
Satisfied	33 (33.7)	29 (30.5)	50 (50.51)	36 (36.73)	51 (51)
Unsatisfied	4 (4.1)	5 (5.3)	15 (15.15)	4 (4.10)	6 (6)
Very Unsatisfied	4 (4.1)	1 (1.1)	13 (13.13)	1 (1.02)	-
Can't decide	2 (2.0)	7 (7.4)	7 (7.07)	1 (1.02)	1 (1)

Table 3-8: Patient who agreed on some of the characteristics of the last physician/dentist seen at KSU hospitals study (1427 H-2007 G)

Characteristics		Physicians No (%)	Dentists No (%)
1.	Respected you	96 (97.96)	82 (96.47)
2.	Dressed well	95 (96.90)	83 (96.51)
3.	Speaks Arabic	95 (96.94)	83 (92.22)
4.	Listened to your problem	91 (92.86)	91 (95.79)
5.	Organized in his/her work	91 (95.79)	75 (89.29)
6.	Requested the investigations in the right way	89 (92.71)	69 (92.00)
7.	Answered your questions	92 (93.88)	81 (86.17)
8.	Requested the proper investigations	86 (87.76)	74 (89.16)
9.	Examined you well	80 (85.11)	85 (90.43)
10.	Was of the same sex	80 (91.95)	66 (83.54)
11.	Reacted to your problem	89 (89.90)	70 (84.34)
12.	Gave enough information about the disease	81 (82.65)	75 (84.27)
13.	Has long experience	82 (88.17)	61 (81.33)
14.	Smiling and friendly	84 (84.85)	74 (80.43)
15.	Took care of psychosocial aspects	78 (81.25)	62 (84.93)
16.	Took vital signs	82 (85.42)	40 (71.43)
17.	Prescribed medicine according to case	56 (62.22)	66 (89.19)
18.	Knows you well	35 (36.84)	31 (47.69)
19.	Was not looking at you when you talk	29 (42.03)	26 (37.14)
20.	Was in a hurry	19 (31.15)	19 (32.76)

Table 3-9: Patient who agreed on some of the characteristics of the last pharmacist/physiotherapist/nurse seen at KSU hospitals (1427 H-2007 G)

Characteristics		Pharmacists No (%)	Physiotherapists No (%)	Nurses No (%)
1.	Dressed well	85 (89.47)	97 (98.98)	96 (98.97)
2.	Respected you	82 (87.23)	94 (96.90)	95 (97.94)
3.	Speaks Arabic	91 (92.86)	95 (97.94)	87 (89.69)
4.	Listened to your problem/queries	76 (81.72)	95 (96.94)	95 (95.00)
5.	Answered your questions	71 (79.78)	94 (96.91)	89 (91.75)

6.	Was of the same sex	82 (90.11)	93 (96.88)	68 (80.95)
7.	Organized in his/her work	65 (69.89)	93 (97.89)	93 (98.94)
8.	Has long experience	68 (77.27)	87 (94.57)	85 (91.39)
9.	Reacted to your problem	56 (63.64)	90 (94.74)	96 (96.97)
10.	Smiling	52 (57.14)	90 (92.78)	89 (90.82)
11.	Took care of psychosocial aspects	48 (55.81)	79 (84.95)	92 (92.93)
12.	Not looking at you when you talk	28 (32.56)	21 (25.30)	36 (41.38)
13.	Knows you well	7 (9.86)	33 (38.82)	15 (19.23)
14.	Examined you well	N/A	90 (95.74)	94 (96.91)
15.	Gave enough information about disease	N/A	77 (81.05)	33 (68.75)
16.	Was in a hurry	37 (43.53)	20 (23.26)	N/A
17.	Did the required exercises well	N/A	92 (95.83)	N/A
18.	Prescribed the exercises according to case	N/A	90 (92.78)	N/A
19.	Gave medicine according to case	83 (87.37)	N/A	N/A
20.	Answered your queries about the medicine	78 (82.11)	N/A	N/A
21.	Gave enough information about the medicine	67 (78.82)	N/A	N/A
22.	Asked about the disease to confirm the medicine	25 (31.25)	N/A	N/A
23.	Gave extra information without asking	24 (31.17)	N/A	N/A

Literature Review

I. Competencies and characteristics that the health practitioner (physician, pharmacist, physiotherapist, etc) should possess upon graduation

Ideally, each university should has to develop it's own learning outcomes using the Delphi technique, interview with recent graduates, critical incident survey and the behavior event interview in addition to literature review and consultations with experts. The outcome should represent the needs of the society. Many individuals will be contributing to the specification of the outcomes. Members from the community will participate in its implementation. If done in this way the staff and others will have ownership and are more likely to help in its implementation. However, we will use the learning outcomes as found in the literature as an example.

One needs to answer the following question:

What are the main problems of the health system in Saudi Arabia?

1. Expensive, highly technical tertiary care hospitals in the main cities while the hospitals in the smaller cities and towns provide low quality services.
2. Weak community Health Services due to inefficient (salary-based) PHC system.
3. Doctors working in the PHC centers are not trained for the job.
4. The media is not contributing significantly to promoting patients' education.
5. The main health problems namely Road Traffic Accidents (RTA), psychological morbidity, obesity and chronic metabolic diseases like Diabetes Mellitus, Hypertension and Hyperlipedemia and smoking were not tackled properly by the health system. There is no clear vision in the strategy to decrease their impact on the community health.

One of the lessons learned form Brown university experience is the development of assessment committees. Their role is not to directly assess students but provide oversight and support to the course leaders in implementing the curriculum. The committees will monitor and approve the assessment to make sure that both the course and the assessment are structured and conducted to enable students to reach the college outcome goals. They are useful to guarantee the success of the mission. Another important issue is the clear communication of the outcome learning goals and the course structure and goals. The use of the study guide is very important in this regard. Without a good study guide the link between the course and the final outcome may be lost. The good study guides review the content area to be covered and therefore provide the students with advanced organizer for their study. This is best presented in the form of a concept map of the areas to be studied. A list of expected learning outcomes may be included. These can be classified using the three circle model described by Harden et al. (1999) – with the inner circle covering "what the student should be able to do", in the middle circle 'the approach to doing it" and the outer circle "the development of the individual as a professional".

1- Essential Common Recommendations for Required Competencies in Health related Colleges Graduates:

Knowledge:

- The scientific facts should stay confined.
- The central part of the curriculum (core curriculum) should include the basics of knowledge and skills and the required directions.
- A part of the curriculum should be elective (about one quarter of the curriculum), i.e. elected by the student himself.

Major Skills:

- First aid and cardiopulmonary resuscitation skills.
- Evidence-based medicine skills.
- Communication skills with patients, their relatives and colleagues. These also include referral and dealing with medical records.
- Self-learning and life-long learning skills.
- Other basic skills such as computer skills and problem solving skills.

Behavioral (Attitudinal) Objectives:

Attitudes and behaviors that suit future responsibilities of students (as health workers) towards patients, colleagues and society should be developed.

1. Awareness of the importance of the following general issues:
   - Reflection on practice, be self-critical and carry out an audit of his work and that of others.
   - The student should recognize his personal and professional limits. He must also realize that consulting with collaegues and asking for help are important for the sake of patient and the learner alike.
   - Accepting constructive criticism and feedback.
   - Considering medical ethics when taking any decision.

2. Awareness of the importance of work environment: The graduate must be aware of the rules, regulations and economic framework related to work environment as well as the national health care and its regulations which include:
   - The care is patient centered.
   - Quality assurance and scrutiny (inspection) systems.

- The importance of health and safety issues in health care, and fighting infections.
- Risk assessment strategies and management.
- The importance of team work for various health professions.

3. Awareness of ethical and legal issues related to:

- Protection of patient's rights and considering his or her own welfare over any other consideration such as keeping his secrets.
- Provision of appropriate health care to patients with special needs (mental or physical disabilities).
- Dealing with issues of providing or withholding treatment (as in terminal cases).
- Responding to patients' complaints and answering their questions.
- Providing information that enables the patient to take his own decisions and consequently taking approval.

4. Awareness of the importance of issues related to health: The graduate should be aware of the issues and techniques involved in studying the effect of diseases on individuals and communities, including:

- Assessing community needs in relation to how services are provided.
- Genetic, environmental and social causes of, and influences on the prevention of, illness and disease.
- The principles of promoting health and preventing disease, including surveillance and screening.
- Understanding the cultural and social environment in which medicine is practiced, and reproductive health and growth.

- Understanding social and cultural values, and differing views about healthcare and illness.
- Taking account of patient's understanding and experience of his condition and its effect on him and his family, and exploring patients' fears and concerns.

To achieve these important common educational outcomes, one must consider the following:

- The core curriculum must be the responsibility of clinicians, basic scientists and medical educationalists. The role and the needs of the students must also be considered.
- Teaching and learning systems must take account of "modern educational theory" and research, and make use of modern technologies where evidence shows that these are effective. Schemes of assessment must take account of best practice, support the curriculum, make sure that the intended curricular outcomes are assessed and reward performance appropriately.
- There must be effective supervisory structures which use an appropriate range of expertise and knowledge.
- Selection, teaching and assessment must be free from unfair discrimination.

2- Required Competencies after the Completion of College of Medicine's Curriculum

Based on educational and pedagogic objectives included in the British document "Tomorrow's Doctor" (1993), it is feasible to divide these objectives into 3 major parts:

1. Knowledge objectives.
2. Skills objectives.

3. Attitude objectives (Behaviors).

After the completion of the Bachelor program in the College of Medicine, the male/female student should have the following competencies:

1. Knowledge objectives:

- The graduate should have the ability to acquire knowledge and understanding of basic and clinical sciences, and relevant parts of behavioral and social sciences. These sciences should be integrated and the evidence from every source should be critically evaluated to provide a firm foundation for medical practice. The graduate must know about and understand normal and abnormal structure and function, including the natural history of human diseases, the body's defense mechanisms, disease presentation and responses to illness. This will include an understanding of the genetic, social and environmental factors that determine disease and the response to treatment including the biological variation. The graduate must also have an understanding of scientific research methods, including both the technical and ethical principles used when designing research.
- **Knowledge and understanding of the principles of treatment including the following**:
    - How to use evidence to evaluate effectiveness.
    - How to take account of patients' own views and beliefs when choosing treatment options.
    - The effective and safe use of medicines.
    - Providing surgical and perioperative care.
    - Recognizing and managing acute illnesses.
    - The care of people with recurrent and chronic illnesses and people with mental, psychological or physical disabilities.

- Rehabilitation for advanced and untreatable diseases and terminal illnesses..

2. Skills objectives (required skills):

- **Clinical and practical skills needed effectively and safely including:**
  - Taking and recording a patient's history, performing a full physical examination, and conducting the necessary analysis to make clinical decisions based on the evidence that have been gathered.
  - Assessing a patient's problems and forming plans to investigate and manage these, involving patients in this process.
  - Calculating drug dosages and writing safe prescriptions.
  - Carrying out procedures involving venepuncture, inserting a cannula into peripheral blood vessels for venous and arterial blood sampling and giving intravenous injections.
  - Demonstrating competence in cardiopulmonary resuscitation and carrying out basic respiratory function tests, administering oxygen therapy.
  - Inserting a nasogastric tube and performing bladder catheterization.

- **Communication skills Practice: The graduate must be able to communicate clearly, sensitively and effectively with patients and their relatives regardless of their cultural or ethnic backgrounds, and colleagues from a variety of health sectors. These communication skills include:**
  - Mastering communication with patients of special needs or with physical disabilities as well as communicating with individuals who speak a different language.

- Communicating in different ways, including spoken, written and electronic means.
- Dealing with difficult situations such as breaking bad news or treating violent patients and those with severe mental disabilities.

- **Evidence-based Medicine Skills:** In addition to the evaluation of studies and research skills, the graduate should be able to search for information relevant to his specialty. The graduate should also have the capability of analyzing data using the basic statistical techniques to improve the practice and problem solving skills.
- **Teaching Skills:** The graduate must be familiar with a range of teaching and learning techniques and must recognize their obligation to teach colleagues. They must understand the importance of audit and appraisal in identifying learning needs for themselves and their colleagues.
- **General Life skills: These include time management, determination of priorities effectively and the use of computer skills.**

3. Attitude objectives (Behaviors):

The same as previously mentioned in the general behavioral objectives for the graduates of health colleges.

3- The Required Competencies after Completing the Dentistry Undergraduate Program

After completing the whole undergraduate program, the Dentist should acquire the following Knowledge, Skills and Attitudes:

Knowledge: The candidate should be able to:

- Recognize the importance of biomedical sciences which form the basis for understanding human growth, development and health.
- Apply their knowledge and understanding of biomedical sciences, oral biology and bio-molecular sciences in the management of their patients.
- Apply their knowledge of the etiology and processes of oral diseases in prevention, diagnosis and treatment.
- Describe the importance of oral biology, to include detailed knowledge of the form and function of teeth and associated structures, in health and disease.
- Describe the modern developments in bio-molecular sciences that may have impact upon the practice of dentistry.
- Describe human diseases and pathogenic processes, including genetic disorders, and the manifestation of those diseases which are particularly relevant to the practice of dentistry.
- Describe diseases and disorders of the oral cavity and associated structures, their causes and sequela together with the principles of their prevention, diagnosis and management.
- Identify the sources of infection and the means available for infection control.
- Describe medical emergencies that may occur in the dental surgery and their prevention and management, including basic life support and resuscitation.
- Describe the importance of communication between dentists and patients, their families, other health professionals and the public in general.
- Describe the medico-legal and ethical principles upon which the practice of dentistry is based.
- Describe specific dental topics including behavioral sciences, biomaterials science, pain and anxiety control, dental public health, oral and maxillo-facial surgery, oral

medicine, oral microbiology, oral pathology, oral radiology, orthodontics, pediatric dentistry, endodontics, pharmacology and therapeutics, preventive dentistry, restorative dentistry.

- Describe when, how, and to whom to refer a patient for specialist advice or treatment.
- Describe the system for the delivery of health care in the KINGDOM with special reference to oral health care.
- Describe oral health needs of different sections of the community, such as those with special needs.
- Describe the broad principles of scientific research and evaluation of evidence that are necessary for an evidence-based approach to dentistry.
- Describe the importance of clinical audit, peer review, continuing professional education and development and lifelong learning.
- Describe the importance and principles of evidence-based practice for the assessment, planning, delivery and evaluation of ongoing care.
- List predisposing and etiological factors that require intervention to promote oral health.
- Describe the pattern of oral disease in society and be able to contribute to health promotion.
- Describe the importance of the safe and effective management of patients.
- Describe the implications of obtaining informed consent.

Skills: The candidate should be able to:

- Communicate effectively with patients and colleagues.

- Obtain and record a relevant medical history which identifies both the possible effects of oral disease on the medical well-being and the medical conditions that affect oral health or dental treatment.
- Assess and appraise contemporary information on the significance and effect of drugs and other medicaments, taken by the patient, on dental management.
- Identify the common signs and symptoms of oro-facial pain, anxiety and apprehension in his or her patients.
- Recognize signs of physical, emotional and substance abuse in his or her patients and seek advice from appropriate authorities.
- Perform a physical and oral examination to include head and neck, oral hard and soft tissues, vital signs, and recognize disease states and abnormalities including detrimental oral habits.
- Establish and maintain accurate patient records.
- Derive diagnoses by interpreting and relating findings from the history, clinical and radiographic examinations and other diagnostic tests.
- Prescribe, take and process appropriate intra-oral and dental panoramic radiographs.
- Assess the level of anxiety in adult and child patients and have experience of using recognized psychological inventories.
- Manage fear and anxiety with behavioral techniques and, when appropriate, with conscious sedation techniques.
- Identify and manage dental emergencies and appropriately refer those that are beyond the scope of management by a primary care dentist.

- Restore teeth to form, function and appearance with appropriate materials, using techniques that preserve the health of the pulp and avoid the unnecessary loss of tooth tissues.
- Manage diseases and conditions involving the pulpal and periapical tissues in both primary and permanent teeth.
- Manage and integrate the procedures necessary to provide biocompatible, functional and aesthetic dental prostheses (fixed and removable) in sympathy with patient requirements or needs as well as identifying cases suitable for dental implants and be able to refer them to the concerned clinician.
- Identify and manage the etiological factors associated with the disordered occlusion.
- Manage basic dento-alveolar surgical procedures, including intra- and post-operative complications and recognize when it is appropriate to refer for specialist help and advice.
- Manage the health and care of the supporting structures of the teeth including soft and hard tissues.
- Recommend and prescribe appropriately pharmaco-therapeutic agents, monitor their effectiveness and safety, and be aware of drug interactions when needed.
- Implement and perform satisfactory infection control measures to prevent physical, chemical or microbiological contamination in the practice of dentistry.
- Make appropriate decisions about the health of patients.
- Demonstrate time management and organizational skills.
- Demonstrate problem-solving skills relating to qualitative and quantitative information.
- Demonstrate computation skills involving word processing, data manipulation.

- Demonstrate sufficient learning skills to sustain lifelong learning and continuing professional development.
- Evaluate patients for fitness to undergo routine dental care, modify treatment plans to take account of general medical status, and recognize those patients who are beyond the scope of their management.
- Provide basic life support for medical emergencies.
- Assess the need for, and provide, preventive procedures and instruction in oral health methods that incorporate sound biological principles in order to preserve oral hard and soft tissues, and to prevent disease.
- Select and use appropriate materials for the treatment of oral diseases.

Attitudes: The candidate should be able to:

- Appreciate the uncertainty, ambiguity and limits of knowledge.
- Demonstrate an investigative approach to academic subjects and clinical practice which integrates theory and practice to identify and solve problems.
- Understand their role within a multi-disciplinary team.
- Show an appropriate professional attitude towards patients and colleagues.
- Demonstrate an awareness of the legal, ethical restraints and constraints.
- Apply flexibility in addressing clinical problems of an unfamiliar nature.
- Accept constructive criticism.
- Recognize and take appropriate actions to help incompetent, impaired or unethical colleagues and their patients.
- Understand the role of psychological development in the management and treatment of the child patient.

- Recognize their role in and responsibility for improving the general and oral health of the community through treatment strategy, education and service.
- Recognize their duty of care to manage the oral health of patients with special needs (including the additional considerations for the dental team) and involve the patient's care where appropriate.
- Manage the dental health care needs of those who may be considered to be socially excluded.
- Adhere to health and safety legislation as it affects dental practice.
- Recognize the importance of infection control and prevention in the practice of dentistry.
- Arrange and use the working practice environment in the most safe and efficient manner for all staff and patients.

4- The Required Competencies after Completing the Physiotherapy Undergraduate Program[1]

After completing the whole undergraduate program, the Physical Therapist should acquire the following Knowledge, Skills and Attitudes:

Knowledge: The candidate should be able to:

- Describe the important concepts of the biological, physical, social, psychological and clinical sciences that are specifically relevant to the practice of PHYSICAL THERAPY.

[1] References

1- NEW ZEALAND COLLEGE OF PHYSIOTHERAPY. http://nzsp.org.nz
2- American Physical Therapy Association (APTA). http://www.apta.org

- Describe the professional and personal scope of their practice.
- List the criteria for effective communication with the patient, client or other users.
- Describe how professional principles could be expressed and translated into action through a number of different approaches to clinical practice and how to select or modify approaches to meet the specific therapeutic needs of individual patients or clients.

Skills: The candidate should be able to:

- Communicate effectively with patients and colleagues.
- Maintain records appropriately. This includes ability to keep accurate, legible records.
- Handle the records and all other clinical information in accordance with applicable legislations, protocols and guidelines.
- Practice the job using the appropriate skills.
- Be able to make referrals where and when necessary.

Attitudes: The candidate should be able to:

- Demonstrate an understanding of the need to establish and maintain safe practice environments.
- Demonstrate an ability to work, where appropriate, in partnership with other professionals, support staff, patients, clients and other users including their relatives and helpers.
- Contribute effectively to work undertaken as part of a multi-disciplinary team.
- Recognize the professional and personal scope of their practice.

- Understand the need to use only accepted terminology which includes abbreviations in making clinical records.

5- The Required Competencies after Completing the Optometry Undergraduate Program[1]

After completing the whole undergraduate program, the Optometrist should acquire the following Knowledge, Skills and Attitudes:

Knowledge: The candidate should be able to:

- Describe the broad and integrated knowledge of the theoretical and applied principles of the anatomical, physiological and perceptual aspects of the visual system.
- Describe the ocular and systemic disease to a level necessary for them to function as effective primary care optometric practitioners.
- Describe the key knowledge of optometry and vision science leading to the achievement of key competencies.
- Describe the current research in optometry and vision science.
- Describe the primary health care function offered by optometry.
- Describe the methods used for correcting refractive errors by procedures altering dimensions of the eye.
- Describe the occupational visual standards so that they may offer appropriate advice to patients.

[1] References

1- Quality Assurance Agency for Higher Education- http://www.qaa.ac.uk/academicinfrastructure/benchmark/honours/optometry.asp
2- General Optical Council - http://www.optical.org/index.shtml
3- American Optometric Association - http://www.aoa.org/

- Describe the evidence-base for common clinical interventions

Skills: The candidate should be able to:

- Communicate effectively with patients and colleagues.
- Apply established analysis and enquiry techniques to optometry.
- Conduct appropriate tests and investigations of visual status in a safe and effective manner.
- Make appropriate decisions about the ocular health of patients.
- Demonstrate an ability to apply research findings to practice.
- Demonstrate critical skills for the evaluation of new concepts, procedures, techniques and products relevant to optometric practice.
- Demonstrate the ability to maintain clear, accurate and appropriate records**.**
- Demonstrate numeracy skills to evaluate data generated through audit and research.
- Demonstrate time management and organizational skills.
- Demonstrate problem-solving skills relating to qualitative and quantitative information.
- Demonstrate computation skills involving word processing, data manipulation.
- Demonstrate sufficient learning skills to sustain lifelong learning and continuing professional development.
- Evaluate critically the relevant literature.
- Ability to critically evaluate and analyze, data generated at work and clinical research findings.
- Be able to dispense satisfactorily to patients..

- Demonstrate an investigative approach to academic subjects and clinical practice which integrates theory and practice to identify and solve problems.

Attitudes: The candidate should be able to:

- Appreciate the uncertainty, ambiguity and limits of knowledge.
- Understand his or her role within a multi-disciplinary team.
- Show an appropriate professional attitude towards patients and colleagues.
- Demonstrate an awareness of the legal, ethical and commercial restraints and constraints within which optometry operates, including legislation relating to the use and supply of ophthalmic drugs.
- Demonstrate an understanding of the role of optometry as a primary health care profession within the framework of the health care delivery system.
- Appreciate the major issues relevant to the future development of optometric practice:
- Apply flexibility in addressing clinical problems of an unfamiliar nature.

6- The Required Competencies after Completing the Nursing Undergraduate Program[1]

After completing the whole undergraduate program, the Nurse should acquire the following Knowledge, Skills and Attitudes:

[1] References

1. Nursing competencies: the artistry of nursing. Victoria Hird. http://www.ciap.health.nsw.gov.au/hospolic/stvincents/1995/a05.html
2. Australian Nursing Federation - Competency Standards for Nurses in General Practice. http://www.anf.org.au/

Knowledge: The candidate should be able to:

- Describe and define the theoretical and applied principles of anatomy, physiology, genetics, immunology, microbiology, pharmacology and nutrition**.**
- Apply knowledge of pathophysiology and its relation to nursing practice for particular health problems.
- Describe physiological changes that occur throughout different stages of the lifespan.
- Describe how knowledge of pathophysiological processes may inform health promotion strategies.
- Describe the contribution of the social sciences to an understanding of health variables: e.g., psychology, sociology, epidemiology, health and social policy.
- Describe the psychophysiology of stress and its implications for nursing practice and health promotion.
- Describe the principles and elements of effective and therapeutic communication and interpersonal skills in relation to patients, relatives and colleagues.
- Describe the importance and principles of evidence-based practice for the assessment, planning, delivery and evaluation of ongoing care.
- Describe research-based evidence applicable to different patients.
- Understand the principles of management and clinical governance within healthcare organizations.
- Demonstrate knowledge of the principles of risk management applied to different clinical situations.

Skills: The candidate should be able to:

- Communicate effectively with patients and colleagues.
- Carry out drug calculations and administration of drugs by appropriate routes.
- Report changes in patient information/data appropriately.
- Make appropriate decisions about the health of patients.
- Practice the required psychological and social caring skills required of patients, clients or groups.
- Demonstrate an ability to apply research findings to practice.
- Demonstrate critical skills for the evaluation of new concepts, procedures, techniques and products relevant to nursing practice.
- Demonstrate the ability to maintain clear, accurate and appropriate records**.**
- Practice the required clinical and practical skills, including the safe moving and handling of patients, basic life support, and those skills necessary to intervene in emergency and challenging situations.
- Demonstrate time management and organizational skills.
- Demonstrate problem-solving skills relating to qualitative and quantitative information.
- Demonstrate computation skills involving word processing and data manipulation.
- Apply nursing methods, protocols and care pathways to appropriate care situations.
- Demonstrate sufficient learning skills to sustain lifelong learning and continuing professional development.
- Critically evaluate research evidence.

Attitudes: The candidate should be able to:

- Appreciate the uncertainty, ambiguity and limits of knowledge.
- Demonstrate an investigative approach to academic subjects and clinical practice which integrates theory and practice to identify and solve problems.
- Understand his or her role within a multi-disciplinary team.
- Show an appropriate professional attitude towards patients and colleagues.
- Demonstrate an awareness of the legal, ethical restraints and constraints.
- Apply flexibility in addressing clinical problems of an unfamiliar nature.

II. Basic contents of the curriculum

Ten Questions to be asked when designing a curriculum: [1]

i. What are the needs in relation to the product of the training program?

ii. What are the aims and objectives?

iii. What syllabus should be included?

iv. How should the content be organized?

v. What educational strategies should be adopted?

vi. What teaching methods should be used?

vii. How should assessment be carried out?

viii. How should details of the curriculum be communicated?

ix. What educational environment or climate should be fostered?

x. How should the process be managed?

In 1986, Ronald Harden from Dundee University, Scotland summarized the most important questions that should be taken care of when planning any training program or study plan. The questions included several tracks and visions that can be applied to various educational programs either in the undergraduate, the graduate or training programs.

The goal of plans and curricula is organizing and integrating regulations and cultural courses to convey the accumulated human expertise.

The Questions included the following:

1. What are the needs in relation to the product of the training program?

Prior to planning to any curriculum, it is important to know the job market and society needs of this program. To determine the actual needs, there are several mechanisms:

[1] Harden RM. Ten questions to ask when planning a course or curriculum. Medical Education; 20(4): 356-365.

A. The wise man mechanism: The teachers in this traditional mechanism determine the need through meetings and group sessions or by referring to references and specialized books in this field.
B. The study of practice errors: This is performed through conducting studies and research to identify defects and shortcomings in the needs of the current curriculum, and investigating the erroneous field practices, and consequently, formulating the necessary needs accordingly.
C. The study of critical events: A group of qualified persons describe health events they suffered from or previously faced and identify defects and shortcomings in them as well as their benefits.
D. Analysis of tasks undertaken by actual practitioners: This is performed through observation of the work of practitioner and documenting the tasks that he undertakes.
E. The study of morbidity and mortality statistics.
F. The study of distinguished practices: The necessary skills and competencies for the profession are analyzed through the practice of distinguished practitioners.
G. The analysis of current curriculum including the syllabus and methods of assessment: This is achieved through the study of tasks undertaken in health institutions with similar orientation and syllabus.
H. Observing new graduates: The new graduates are asked to write their comments about the program regarding matters included or not included in the curriculum.

Generally, the smart-man mechanism is the most commonly used in determining the needs of the curriculum, with the possibility of performing more than one method to achieve this.

2. What are objectives and goals of the training program?

Prior to its application, the objectives of each program should be clear and approved. The main objective for the health college is probably the graduation of competent practitioners who are qualified in a way that complies with the community needs and the ability to pursue education. Therefore, the objectives of the curriculum must detailed information about what is needed from the graduate after the completion of graduation requirements.

The distinguished curriculum is the one in which the needs of society and work market meet with objectives, where there is no existence for objectives that do not serve the outcomes and all the needs of the graduate have been satisfied through the established objectives. Although the realization of this is difficult in many instances, it is the duty of the planner of the curriculum to consider this issue.

3. What is the syllabus of the program?

This issue is one of the most important and, at the same time, the most difficult issues since it is not easy in medical education to determine the minute details of the curriculum in terms of comprehensiveness and the accepted depth in all of its parts.

Generally, deciding the syllabi of any curriculum requires the following:

a. The direct contribution of this part of the curriculum in achieving the objectives of the program. For instance, if the skill of measuring blood pressure is necessary for the graduate, then the way to achieve it is to teach the graduate how to use sphygmomanometer.

b. The building blocks and basic rules of knowledge and skills that should exist to reach to the expected outcome of the program. For instance, learning the

anatomy and various functions of the heart have a direct relationship with the symptoms of heart diseases and the ability to treat them.

c. Self development leading to the development of the student's cultural competencies and critical thinking.

d. The role of this part of the syllabus in facilitating the understanding of other contents of the curriculum. For example, the inclusion of an introduction about radiography in the syllabus of the anatomy course will contribute to understanding of applied anatomy.

4. Organization and order of the content?

The order of syllabi in this stage is determined by observing the objectives and the role of each part in achieving the understanding of other parts. For example, starting with basic health sciences and the normal structure of the body contributes in understanding of the possible abnormalities in various organs, and perhaps starting with abnormalities could be the way to know the normal structure and functions, and so on.

One of the important questions in this side is: when is it considered appropriate to teach a certain skill or certain knowledge? Also, should the teaching of this part be as an intensive unit or spreading it in the curriculum over a long period of time? One of the important issues also is assigning of the teacher and the department responsible for covering this part.

5. What are the educational plans (strategies) that should be adopted?

The choice of the strategic plan is not a simple issue. It needs a decision based on strong basis. It includes the following:

a. Centered-education: is it student-centered or teacher-centered teaching? Student-centered teaching gives the opportunity for the student to actively participate in learning and application of curriculum as well as when and where to learn and the techniques that should be followed. Teacher-centered education depends on the teacher in teaching and learning.

b. Should problem-solving or information acquisition techniques be used? During the problem-solving technique, the student is acquiring information through dealing and solving problems designed for this purpose, whereas the information acquisition technique depends on the direct presentation of the information.

c. Is the curriculum combined or specialized (separated)? The combined education is dealing with combining various specialties so that it appeared as one system not separate systems (circulatory system, respiratory system, etc.), whereas the separated curriculum presents each specialty independently without considering the body structure (e.g., anatomy, biochemistry, pathology, etc.).

d. Is it community-centered or hospital-centered curriculum? The community-centered curriculum deals with health of the community issues and learning is practiced within the community boundaries, whereas the second type is practiced around the hospital in terms of learning and application.

e. Is the syllabus mandatory or elective? In elective curriculum, the student is given a wider opportunity to choose programs, specialties or syllabi he is willing to learn provided that he is familiar with the core curriculum.

f. Is the curriculum ordered, planned or opportunistic? In the ordered curriculum, the syllabus is already organized and ordered by the departments and colleges, whereas in the opportunistic curriculum, the student is learning depending on

the wishes, likings and expertise of teachers and the cases he sees are those encountered by accident.

6. What are the teaching methods that should be used?

It is important here to specify two issues:

a. Students' groups that should be divided and taught. They include:

- Teaching all students in lectures and others.
- Small groups of students and discussion roundtable groups.
- Self learning for each student.

Although group lectures for all students are important, the contact of small groups of students with teacher is more effective in learning the skills and procedures. In any case, each method requires a different educational style. The benefit of self learning is that the student selects the place, the time and the method of learning. Generally, combining the three methods is beneficial and effective in learning.

b. Tools and methods of teaching: The use of multiple methods for teaching such as slides, real-time video movies, presentation instruments, computers, printed references, mannequins (doll lay figures) and real patients, etc, is considered effective in delivering information. Some tools can be used in all lessons while others are probably not suitable for some other lessons. Therefore, it is important for the choice of the presentation tool to comply with the nature of the lesson. The value of teaching is greatly dependent on the presentation tool used and how it is used. The choice of teaching tool depends on the objectives and goals of the course, availability of facilities and the expertise of teachers in using various tools.

7. How to assess student performance.

It is imperative for each successful curriculum to fairly and impartially assess the students as well as evaluate the curriculum or the course itself. There are four aspects that should be pointed out in students' assessment issue. These are:

a. Assessment mechanism: There are many tools for assessment such multiple-choice questions (MCQ), essay questions, short essay questions, oral tests, clinical tests, objective structured clinical examination (OSCE) and periodical reports of the class teachers. Generally, it is imperative to select the most appropriate assessment tool. This depends on the available facilities and the expertise of faculty.

b. Selection of Evaluator: The question that comes to mind is: who is the evaluator? Is the course teacher the evaluator or somebody else? Also the estimation of the student' self learning marks are important for those who want to adopt self learning principle.

c. Assessment timing: Is it a continuous assessment or only at the end of the semester?

d. Criterion for success or failure and grades: In some courses the student is assessed on the basis of success/failure only based on the ability of the students to comprehend the course material. In other courses, the results of the students are distributed to different grades according to their levels and answers.

The other aspect of assessment is the evaluation of the course material and the curriculum: the acquisition of information is one of the most items in the course and curriculum assessment although it does not fully reflect it since there are other factors that could lead to students' information acquisition other than curriculum perfection. The

curriculum planners should analyze the means through them the curriculum can be evaluated without neglecting the students' feedback testimonials.

8. How to connect the details of the curriculum and its declaration?

It is imperative for any curriculum to find mechanisms to connect it with the teachers who will apply it and the students who will benefit from it. This is usually achieved through course schedules and syllabi. The other method to achieve this is through the presentation of objectives and goals. There are other methods to connect the syllabus and curriculum such as concept mapping method via a scheme showing the general outlines of the curriculum and connecting between them.

9. What is the nature of supportive educational environment (Academic atmosphere)?

The educational environment has a great impact on the outcomes of curricula; therefore, it should be taken care of and should be thoroughly studied since it motivates learning and studying, and reflects the social solidarity between the students. It is necessary for the educational environment to be supportive and encouraging to the students to build the good learning and studying skills and enhance professionalism, modesty, honesty and respecting deadlines. The favorable educational environment encourages the students to be social and to work with team spirit. The existence of supportive services such as the library, skills laboratory, anatomy museum and Internet and computer services in addition to providing a study guide to facilitate the educational processes.

It is important to use one of the criteria and tools (such as the one used in this study) that could be used to measure the educational environment and determine points of defects to treat whatever possible to treat to achieve the program objectives.

10. How the educational process is managed?

To guarantee the efficiency of the curriculum, it is important to specify an authority responsible for its planning, revision, development, and monitoring. Also it is important to set appropriate mechanisms to accept and activate thoughts and innovative suggestions. It is imperative for the role of each individual in the educational process to be clear: what is the role of the chairman of the department? The course teacher and curriculum committees? Are responsibilities given to individuals or committees? Who is the representative of the committees? What is the role of the student in the development and revision of the curriculum? Is it necessary to have a representative for the students in each committee?

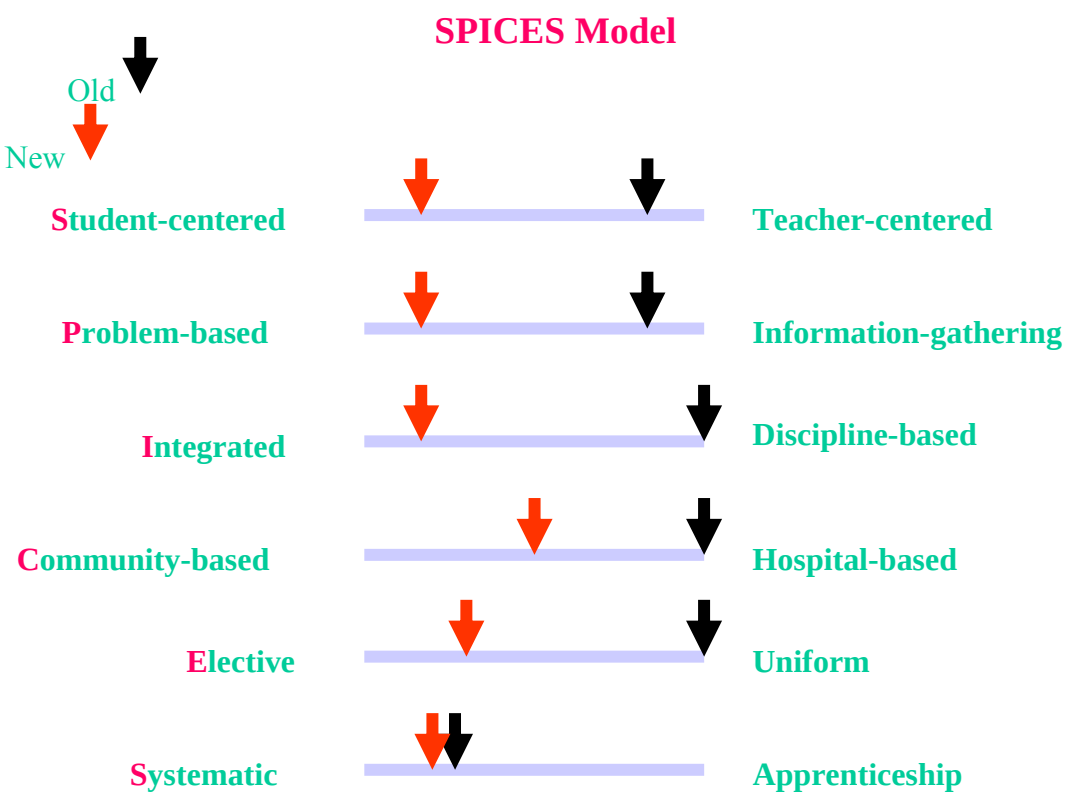
All of these issues among other issues should be approved and a decision should be taken in the light of expertise, available facilities and scientific evidences.

III. Curriculum Strategies

The six dimensions of the SPICES model:

Six educational strategies have been identified relating to the curriculum in the medical education. Each issue can be represented as a spectrum or continuum. The factors supporting a move towards each end of the continuum will be presented for each strategy. This can be used in curriculum planning, in tackling problems relating to the curriculum and in providing guidance relating to teaching methods and assessment. Each school, however, has to decide where it stands on each issue and to establish its own profile.

The acronym "SPICES" in derived from the first letters of each strategy.



1- Student centered

The benefits for the change to the left (student-centered) are:

1. It better meets students' needs and fills gaps of knowledge and other competencies.
2. It may reduce repetition of topics discussed in other departments e.g. Medicine Department may teach topics taught in Family Medicine e.g. irritable bowel syndrome, Iron deficiency anemia and diabetes.
3. Student-centered curriculum prepares students to be life-long learners.

However, there are difficulties in implementing a student centered model, Here are some:

1. Teacher's lack of experience and motivation.
2. Student's lack of experience.

2- Problem-based curriculum.

Problem Based Learning (PBL) vs. traditional curriculum:

Compared with conventional instruction, PBL (as suggested by the findings of Albanese and Mitchell) is more nurturing and enjoyable; PBL graduates perform as well, and sometimes better, on clinical examination and faculty evaluations. Further, faculty tends to enjoy teaching using PBL. However, PBL students in a few instances scored lower on basic sciences examinations and viewed themselves as less well prepared in the basic sciences than were their conventionally trained counterparts. PBL graduates tended to engage in backward reasoning rather than the forward reasoning experts engage in, and there appeared to be gaps in their cognitive knowledge base that could affect practice outcomes. The costs of PBL may slow its implementation in schools with class sizes larger

than 100. While weaknesses in the criteria used to assess the outcomes of PBL and general weaknesses in study design limit the confidence one can give to conclusions drawn from the literature, the authors recommend that caution be exercised in making comprehensive, curriculum-wide conversions to PBL until more is learned about i. the extent to which faculty should direct students throughput medical training, ii. PBL methods that are less costly, iii. cognitive-processing weaknesses shown by PBL students, and iv. the apparent high resource utilization by PBL graduates.

The desired status is towards **problem-based curriculum** for the following reasons:-

1. It prepares students for clinical practice through fostering their problem solving and decision-making skills.
2. Better prepare students to be self-directed and life-long learners. This is important as the half-life of medical information is short (5-10 years). They would be more able to cope with the changing environment.
3. More likely to discuss important topics that are likely to be faced in the future as physicians.
4. When used in conjunction with small-group work, it encourages team working.

Some challenges in implementing PBL approach are:-

1. Lack of materials and resources to support this approach.
2. Lack of teacher experience and motivation.
3. Work overload of teachers.
4. Student insecurity

3- Integrated Approach.

The reasons for this **Integrated approach** are:-

1. It promotes a holistic view to patients' problems.
2. It encourages team working, shape students' attitudes and promote staff collaboration which better prepares students for future practice.
3. It reduces knowledge fragmentation.
4. It reduces repetition of topics discussed by different departments.

4- Community-based vs. Hospital-based

What is meant by community-based and community oriented medical education (COME)?

COME is an approach to medical education. It is an education which is focused on population groups and individual persons taking into account the health needs of the community concerned (Network of community-Oriented Educational Institutions for Health Sciences, First Meeting, 1979).

How are some schools moving towards community orientation?

According to Fulop in Tutorials in Problem-based Learning, graduates of medical programs should be able to

- Respond to health needs and demands of the community.
- Stimulate a healthy lifestyle and self-care.
- Educate the community.
- Orient all the community towards health promotion and disease

Prevention.

- Work with health teams.
- Continue lifelong learning.
- Prevent disability.

In other words – ‘a community oriented education ‘.

Community basis:

“Often the most valuable and unavailable technology is the technology of providing efficient, effective, basic primary health care”.

The Kellogg Foundation

One of the main strategies for facilitating community orientation has to be a community based (CB) program. In any community there is a network of facilities providing health care within the individual’s life setting and it is essential for students to benefit from community-based activities at regular intervals throughout their curriculum. A program is considered community based if ‘it consists of an appropriate number of learning activities in a balanced variety of educational settings’.

This in no way attempts to denigrate the importance of secondary or tertiary services; rather it is an attempt to redress the balance.

Advantages of community-based education

- It encourages teamwork.
- It can provide early exposure to patterns of health.
- It allows students to understand the needs of the community and to contribute to the care of the chronically sick.

- It relates theory to practice in the context of where students will be required to work on graduation and allows observation of the relationship between organic, psychological and social dimensions of health and illness.
- It enables students to establish closer communications with their communities by studying health, disease and disability in a natural context.
- It confronts students with the reality of care and the uncertainty at the centre of clinical practice.
- It helps students acquire the competencies required, given the facilities available.
- It links service to education at community level and raises standards of care, particularly in the areas of communication, information management, and patient education, as it treats them as specific techniques to be learned.

What is the ultimate aim of COME?

Parameters	Traditional practice	Community-oriented practice
Primary focus	Sick individual	Community health
Target population	Sick and disabled	Total population
Setting for training medical interest	Hospital training	Hospital, health centre, agencies
Practice	Initial intervention therapeutic procedure	Involves patient in care decision
Problem-solving Process	Differential diagnosis of medical disease	Assessment of patient needs – social, psychological, physical
Objective of practice	Focus on curative	Focus on prevention
Health development	Hospital	Where development most appropriate

This is probably because such a change involves a radical shift in thinking with medicine being less and less about prescriptions and more and more about optimal choices specific to the particularities of each situation.

Students need to learn to diagnose, not only disease but the health system with its complicated structures and processes, to treat not only with prescriptions, but to enable communities to make the most appropriate choice. What is needed is a handing back of some responsibility for health care to the community.

Undergraduate medical education should teach the basic skills required to go on to postgraduate training or to enable doctors to practice as generalists in primary health care. To achieve this, medical schools will have to transform their specialist training into a community-oriented, generalist education.

As far back as 1912 it was stated by Abraham Flexner that 'the physician's function is fast becoming social and preventive rather than individual and curative. Upon him society relies to ascertain the conditions that make positively for physical and moral well-being.

As for basic sciences, COME programs are usually integrated and in most of them students continue to learn their basic sciences throughout the whole period of their studies. The teaching/ learning of basic sciences is therefore not limited to the first 2 or so years of medical studies and, what is more, they are learned with relevance to medical practice and not in isolation. In this way, students become more motivated to study them. The study of basic sciences within the context of the clinical sciences is supported by many recent studies (e.g. Patel and Dauphinee 1984; Balla et al. 1990; Coles 1990) to help learning them with ability to use them when needed. In the traditional curriculum, students may consider basic sciences as a hurdle and once they were over it to clinical sciences they forgot all about it. The new approaches are in fact in favor of basic sciences. In Gezira,

University, Sudan for example, the basic scientists actively participate in the final certifying examination, both in its theoretical and practical components.

Advantages of Community-based curriculum.

1. A significant proportion of students will have their future practice in the community.
2. Students will have a better appreciation of the differences between the two settings (hospital and community-based).
3. Student's understanding of the health system outside the hospital.
4. The community is a more appropriate setting to learn about prevention.
5. Early and undifferentiated presentation of health problems in the community which is more appropriate setting for presentation.

5- Elective vs. Uniform

Advantages of elective curriculum:

1. It reduces the curriculum overload: The core curriculum should not necessarily include all the information needed to be a surgeon, a psychiatrist and a neurologist but the essential competencies needed for the first year resident in the residency programs (vocational training programs) of most specialties.
2. By adding electives, students could select areas of particular interest or need.
3. Special study modules also facilitate for students to study individual disciplines for career development.
4. It provides students with increased responsibility to plan their learning and for decision making.
5. It may change the attitudes of some students e.g. an elective course on nursing skills may promote future staff collaboration and team working with nurses.

6- Systematic vs. Apprenticeship based

Reasons for preferring a more systematic approach are:

1. The core competencies will be covered during the rotation.
2. Better utilization of the time.
3. It would encourage students to actively look for cases and learn important topics and concepts.
4. It may motivate trainers and tutors to help students to achieve their goals.

Position on the SPICES Continuum:

Each medical school has to decide where it stands on the SPICES continuum. Many of the newer schools have taken up a position to the extreme left on all of the parameters while more traditional schools may be regarded as being on the extreme right.

The question sometimes asked is which is the correct stance? Some would argue that a position on the left is more appropriate to meet current needs and that one should aim to have SPICES in the curriculum. Others would argue that the position to the right is more appropriate and that this model has, by and large, stood the test of time. Such views are equally unhelpful.

The 'newer' education strategies or SPICES offer the teachers many advantages. To continue with traditional approaches ignores the changes that are taking place in medical practice and may lead to an increasing discrepancy between the health care delivery system and the medical curriculum. However, too many spices in food may make it unappetizing

and inedible; so too in the curriculum, where too many SPICES may make it equally unacceptable.

The SPICES analytical technique described is useful in a number of situations:

1. The review of an existing curriculum by a curriculum committee or other group. For example, the SPICES model may help to assess whether the curriculum relates to the perceived objectives or aims of the school. The SPICES model can provide a measure of the extent to which the stated aims of the school are a reality or simply a disguised form of science fiction.
2. The development of a new curriculum. The issues reviewed in the SPICES model can provide a framework around which a more meaningful discussion about curriculum planning can take place.
3. The tackling of specific questions or issues relating to the curriculum. This may relate to the teaching of one subject or topic; for example, the behavioral sciences or one aspect of the curriculum such as research. By considering each of the six issues in relation to the question a better understanding may be achieved and more meaningful decisions taken. For example, a commitment by the school to emphasize research training for its students would suggest the position it should take on each of the issues. The curriculum would tend to be more student-centered, and more problem-orientated. A decision as to whether the curriculum should be integrated, or community-based, would depend on whether one wished to encourage interdisciplinary and community-based research. A core curriculum with some elective opportunities would provide students with more opportunities for research.
4. Decisions about teaching methods. Decisions in relation to each of the SPICES issues have implications for teaching methods within the school. For example, a more

student-centered curriculum will require access to resource material and the organization of small group work.

5. Decisions about assessment. Consideration of the issues may also provide points to the most appropriate methods of assessment. For example a community orientation should be reflected in the assessment procedures and integrated courses should not be assessed by discipline-based examinations.

IV. Quality Assurance[1]

Quality refers to the standards that must be met to achieve specified purposes to the satisfaction of customers. The purpose of teaching is, of course, learning. So quality of teaching is its' fitness for the purpose of promoting learning.

Quality assurance is a process whereby a manufacturer or producer guarantees to a customer or client that the goods or service concerned will meet standards consistently. Universities are trying to assure their customers, whether students, employers or grant-awarding bodies, society or its' representatives that their service is up to scratch.

The following are characteristics of quality assurance wherever it occurs:

1. The specification of standards for whatever is conceived as the product or service.
2. The identification of critical functions and procedures that will be necessary to achieve these standards.
3. Constant recourse to the consumer to set and monitor the accomplishment of standards.
4. Documented clarity with regarding to both the standards to be achieved and the procedures that must be followed to achieve these standards.
5. Monitoring that standards are being met and procedures followed, and taking action to remedy or rectify shortfalls coupled with a regular review of the appropriateness of standards and procedures.
6. The total involvement of all personnel and a commitment to development and training.

[1] References

1. Ellis R (1993) Quality Assurance for University Teaching: Issues and Approaches, pp3-15, in Quality Assurance for University Teaching, edited by Roger Ellis, the Society for Research into Higher Education and Open University Press. ISBN 0335 190251.
2. Stewart A. Quality Assurance in Medical Education. Center for medical education, Tay Park House, Dundee, U.K.
3. Adelman C and Alexander RJ (1982) Institutional Evaluation: Definitions, Practices and Issues, pp-5-30, in The Self-Evaluating Institution – Practice and Principles in the Management of Educational Change. Methuen, London and New York, ISBN 0-416-32750-8.

There is, of course, no point in teaching unless somebody, other than the teacher, learns from it. So whatever standards are set for, teaching would have to relate in some systematic way to the effect of that teaching on desirable learning in students.

What is the role of the health teacher in the organizational arrangements and operational procedures of a QA scheme:

The greatest asset of the health colleges is their teaching staff. The quality of teaching and learning depends very heavily on the abilities of the teaching staff.

The health teacher could perform some or all of the following roles to foster the college QA scheme:

1. Provider of a high quality teaching and facilitation according to the curriculum plan and up to the specified standards and guidelines. The process of improvement could be enhanced through making use of feedback from students, colleagues, external examiners and self-evaluation.
2. Active member or coordinator of one or more of the QA groups or committees. He/she will collect and analyze the evaluations and questionnaires submitted from many sources and will write or discuss reports that will be submitted to higher committees (groups). He/she will advise and exchange opinions and ideas with other committee members.
3. Advocate to the QA scheme through observing the process of teaching and the educational environment in the college and acting through taking the appropriate actions.
4. Motivator of the teaching staff colleagues, administrators and students to cooperate for the smooth progress of QA tasks. This could be through role model, advice or exchange of ideas or teaching medical education topics like assessment tools, teaching principles and theory and supervision skills.

5. Researcher: Participate in longitudinal studies to provide data needed to evaluate the educational process and outcome and identify some indicators of success.
6. As a member of the Faculty Development Program committees or instructor of some of its activities. The aims of the Faculty Development and Review scheme are to help teaching staff to develop as individuals by fostering their professional development in order to enhance job satisfaction and performance, thereby improving the performance of the medical college and ensuring quality in medical education. The on-going programs of faculty development are concerned with teaching and learning, assessment and evaluation, educational media, research methodology, research and technical writing, management, and information technology. These programs are offered either locally, through the Medical Education Unit in each college, or nationally, through the Center for Medical Education, as appropriate.
7. Faculty Evaluation: Each Chairman of Department will hold an annual meeting with each member of his staff to discuss with them their strong points and points for improvement. The teaching staff has to fill a pre-designed form before the meeting. Each faculty will be evaluated annually by his undergraduate and postgraduate students.

Purposes of faculty evaluation include:

1. To help the individual instructor to improve as a teacher.
2. To provide information for decisions about tenure, annual salary increases and responsibilities.
3. To help improve the quality of teaching and other objectives of the medical school.

V. Electronic Learning (e-Learning)

The use of the new technology and E-learning in the Undergraduate curriculum[1]

The e-learning concept:

The e-learning is style of learning in which the learner uses modern communication environments that includes computers and networks. The educational medium of e-learning includes multimedia comprised some text, pictures, graphics, sound, animations or all of them as well as the electronic libraries and search mechanisms. The e-learning could be online or offline. It depends on three important technical sources, namely, the Internet, Local area network (LAN) and compact disks (CD's).

Al-Moussa (1425 H) defined e-learning as "a method of learning using modern communication mechanisms including the computer and its networks and various multimedia such as sound, pictures, graphics, search mechanisms, electronic libraries and the use of various types of technology to disseminate information to learner in the shortest time, the least time and the most benefit possible".

Types of e-learning:

E-learning can be divided into two major divisions: online and offline e-learning.

Properties of e-learning:

The use of e-learning technology in colleges, institutes and universities will save lots of money that could have been spent for concrete building equipped with instruments and

[1] References

1. Jamal Abdulaziz Al-Sharhan. Educational Tools and Innovations of Educational Technology (Arabic text). 3rd Ed., Al-Homaidhi Printing Press, Riyadh, 2003.
2. Jamal Abdulaziz Al-Sharhan. Electronic book, electronic school and the virtual teacher (Arabic text). 2nd Ed., Al-Homaidhi Printing Press, Riyadh, 2001.
3. Jamal Abdulaziz Al-Sharhan. Electronic Eduaction Technology (Arabic text). First Ed., Al-Homaidhi Printing Press, Riyadh, 2006.

apparatus, and the needed land space etc. Online-learning provides an interactive learning environment between the learner and the teacher and vice-versa, and between the learner and other learners. The e-learning allows conducting practical experiments step by step, and gives the opportunity to continue in experiment during an open period of time. Online-learning gives the student the freedom of morning or evening studies or joining training sessions of some study programs during the summer vacation.

Justification for using e-learning:

1. Investment in human education and development of his skills and knowledge.
2. Possibility of education, training and qualifying the learners without leaving their place of work.
3. The e-learning contributes to improving and enriching the standard of education.
4. The establishment of real communication between the teacher and the student, and reaching to curricula easily.
5. The encouragement of self learning and accounting for inter-students variability. The student also can learn step by step or jumps over the learning stages that he considers easy and inappropriate to his educational level.

Benefits of e-learning:

1. E-learning provides electronic information in an interactive electronic environment between the teacher and the learner.
2. E-learning uses modern communication means for the presentation of material and educational programs to serve a large number of learners.
3. E-learning assists in expanding the opportunities in educational institutions.

4. E-learning assists in the communication between students and teachers, between the students themselves or between the students and the educational institutions due to ease of electronic communication.
5. E-learning assists in solving the problem of crowdedness of classrooms and the lack of available facilities. The new technologies assisted the growth of self learning to suit learner's needs.
6. The curricula and educational programs in e-learning are subjected to many studies where these are supervised by specialized teachers so that the learner will be able to read and comprehend the course material independently.
7. E-learning allows the teacher to minimize the routine and administrative load in classroom compared to traditional education.
8. The modern technologies assist through e-learning in solving educational problems such as the shortage of teachers and specialized professors with distinguished educational competence.

Traditional and E-learning Environment:

The educational environments are classified into two types:

1. An educational environment where there is contact between the teacher and the student, and includes the following:
    a. Traditional classrooms.
    b. Traditional classrooms supported by modern technologies such as computers and Internet in the classroom.
2. An educational environment where contact is achieved through information and communication technologies and include:
    a. Virtual synchronous classrooms:

This type of e-learning is considered as a type of tele-education where the teacher synchronously meets with the students through the Internet, i.e. at the same time via chat rooms or video and audio conferences

b. Virtual asynchronous classrooms:

The teacher and students in this type of tele-education do not meet through the Internet at the same time but it depends on Internet menus at different times.

Frameworks of e-learning:

1. Communication technology: we have to determine the required infrastructure of telephone communication network and Internet network in as well as determining the required number of equipments and applied educational software needed by learners in the e-learning system.
2. Educational process: we have to determine who is the learners' category? What they will learn or what are the contents of material that they will study? What are the means that will be used to present the scientific material? What is the certificate that they will obtain? And so on.
3. Services: we have to determine the services that should be provided to learners in the educational institution, and what are the modern methods to improve the performance of learners? And how to effectively achieve the objectives of the educational institution?
4. Site design: The quality of site design is an important factor in enticing learners and attracting their attention toward the pathways of the e-learning institution. The learner can move between many educational pathways in the well-designed site with its high quality production of pictures, animations, figures and tables. Of

course this site will attract the attention of learners and provoke their enthusiasm toward learning without any feeling of boredom. The opposite could happen if the educational site of the institution is otherwise.

5. Educational and administrative cadre: A staff of teachers and administrators who are proficient in computers and communication networks should be available. In addition, teachers should be able to teach through electronic education system. The technical staff requires computer and network skills and knowledge of some computer software related to the electronic school system.
6. Assessment:

   The assessment of electronic education system should be through the results obtained by the system master from the teachers, students and technical and administrative staff in the educational institution in which problems are diagnosed and points of weakness and strength are identified.

The role of teacher in e-learning:

The e-learning has changed the role of the teacher from the presenter to the role of advisor and supervisor of the educational process taking into consideration the following:

1. Determining educational objectives clearly.
2. Determining the e-learning materials need to be known.
3. Receiving students' answers and knowing their results.
4. Encouraging students for self-education and accounting for interindividual differences.
5. Flexibility in modifying or updating the contents of the e-learning study material.
6. Possibility of transferring the scientific information to students quickly through e-mail as an example.

7. Possibility of using multimedia in supporting the study material through the use of movies, animation, pictures, graphics, figures, tables and data.
8. Assessing the educational process in general or the possibility of instant assessment of the learner.

E-Learning center:

The e-learning center depends fundamentally on computer network and communication network connected to the World Wide Web (WWW).

Types of e-learning centers:

1. Self-controlled e-learning center: The learner can control the study program according to his scientific needs in his suitable times.
2. Live e-learning center: It depends on the presentation of educational material to the learner directly since it allows the direct interaction between the student and the teacher through direct chatting for instance.
3. Direct and indirect e-learning center: This center is one of the important centers that combine direct and indirect learning. This center changes the traditional classroom image manifested in conventional explanation and presentation by the instructor, as well as listening and memorizing by the students to a direct and interactive learning environment through the availability of a computer for each student and the use of the intelligent blackboard instead of the traditional blackboard in explaining the study material that contains various multimedia.

Objectives of e-learning center:

There are some objectives related to the e-learning center. These include:

1. The center is a rich educational environment with a multitude of electronic resources that serve the educational process and encourage learning.
2. The center provides e-learning materials and programs for all courses to benefit from them inside and outside the classroom through the Internet.
3. The center provides the study material as an e-learning package that can be accessed anytime anywhere.
4. The center provides communication to many websites that can be used in the educational process since they contain much different information.
5. The center assists in the scientific connection between the students, teachers and the e-learning institution away from study times through Internet connection to the e-learning institution site.
6. Benefiting from the opinions of teachers and students in designing the site of e-learning institution and benefiting from all their incoming critiques.

Educational environment of e-learning center:

A. Basic components:
    1. Teacher.
    2. Learner.
    3. Technical support staff which requires the following:
        a. Specialization in computer and computer networks.
        b. Knowledge in some computer programs:
            - TCP/IP Networking.
            - Data communication Networking – LAN & WANs.
            - WWW, e-mail and FTP server experience.
            - Operating system programs used server.

4. Technical support officer
5. Central administrative staff.

Elements of e-learning center:

Admission and enrollment – study courses – direct learning – e-library – scientific activities – electronic assignments – electronic exams – e-mail – administrative and educational aspects – general follow-up.

Advantages of e-learning center:

1. It provides an interactive environment between the student and the teacher.
2. The flexibility in accessing the center's website.
3. It develops learner's self learning through student's efforts in teaching himself.
4. The ease of accessing the center's website and benefiting from electronic information in enriching the level of learner and improving the level of his intellectual competence.
5. The teacher has an important role in supervision and advising.
6. E-learning promotes self-independence.

Criteria for the assessment of e-learning programs:

There are a set of criteria that should be considered when assessing e-learning programs. These include:

Educational program design – Curriculum – Interactive teaching method – Incentive – Enthusiasm – Teaching media – Audio – Computer – Storage – Assessment.

Multimedia:

Concept of Multimedia: Multimedia is a term that includes software and hardware. These are defined as a set of information in the form of text that includes the following elements: digital photos - Audio – Animation – Video clips.

Advantages of Multimedia in education:

1. Supporting and enhancing the educational process through the presentation of information by various techniques for different knowledge resources.
2. Computer-enriched learning.
3. Making the learning process enjoyable and interesting through the presentation of attractive photos, graphics, audio, various video effects and animations.
4. Presenting information in an attractive and brief way through the explanation of concepts by using 3-dimensional (3D) graphs that clarify and simplify lots of information.
5. Some software specialists of technicians, researchers and others can create various subjects that include a number of multimedia using readily available software in local market.
6. Numerous multimedia including graphics, figures, audio, and other supporting educational media that the teacher can use in teaching a course using LCD and data show connected to computer and displaying them to students.
7. It gives the program user a great deal of privacy that allows him to experiment and use the program without embarrassment or fear of others.
8. The user has the opportunity to use simulation through multimedia software that includes practically and physically difficult-to-run operations due to high cost.

9. Multimedia has an active role in training where it contains a special training environment that combines interactivity and the advantages of computer.

Uses of multimedia in training:

Many reasons lead to the importance of using multimedia in education and training to satisfy the society's needs of qualified personnel and trainees in various scientific and technical fields. Of these reasons, the rapid increase in information growth and proliferation of science with its multitude of disciplines and specialties. In contrast, few specialized teachers, the slowness of feeding information using modern technologies and the imbalance between the number of teachers and the students are observed. All of these reasons urged those who are responsible for educational and training institutions to launch new tools and styles of education that satisfy society's needs and promote and encourage self learning in all scientific fields by the use of computer as an interactive tool for education and training. Therefore, many institutions and companies resorted to training and qualifying their employees continuously using multimedia to save funds, even some of them used modern technical innovations to reduce manpower and to minimize overhead spending. This means that a limited number of employees could perform the work and many complicated tasks to maintain competitive perseverance with international firms and corporations.

Electronic Book:

The electronic book, one of the modern technologies that imposed a new reality in teaching and training methods, has appeared as a result of the information revolution that we see in the modern era. The electronic book contains many electronic pages that are called the

"text". It also includes some pictures, video, sounds and sound effects. The electronic book was dubbed this name because its contents are stored on a CD-ROM.

Comparison between traditional print and electronic book:

1. The electronic book came to solve the problems of printing and publication on a large scale.
2. The electronic book reduced the number of steps needed for printing such as the montage and the preparation of the master copy. All of these steps were combined in one step.
3. Canceling the role of skilled workers in printing, montage, design and drawing through the use of computers and software.
4. High speed in preparing and finishing the scientific material with guaranteed efficiency and ease of updating information.
5. The low cost of electronic book which is about one tenth the cost of traditional printing.
6. The ability to distribute the electronic books allover the world.
7. The ability to search the text for a particular word to know its location or frequency.
8. The ability to publish the electronic scientific material using the well known communication means such as the Internet, etc.

Distance Learning:

Distance learning is broader in its meaning than correspondence learning. Distance learning uses the printed word as well as other modern communication means such as television stations or satellites to broadcast the scientific material to faraway distances

where no teacher is needed or a classroom is available. What only needed are a tutor and an educational institution to supervise the educational process between the tutor and the apprentice.

Advantages of distance learning:

1. The study programs of distance learning are subjected to several studies for its preparation and supervised by specialized professors to enable the learner read, understand and comprehend the study material independently.
2. Distance learning allows the enrollment of large number of students regardless of age or grade.
3. Distance learning uses modern communication means in broadcasting study programs to serve large number of learners.
4. Distance learning allows a two-way communication between the student and the educational institution through teachers and advisors.
5. The modern technologies through distance learning allows independent self growth to suit the individual needs and requirements where the learner progresses in his learning activities according to his capabilities, intellectual abilities and family and occupational circumstances, etc.

Virtual Reality (VR):

The virtual reality technology deals with information and alternative expertise presentation to accurately simulate reality. It is similar or very closely similar to reality and depends on rationality, systems and the use of graphics for information presentation utilizing science fiction.

It is defined as panoramic shows related to the three senses, namely, the eye, hearing and touch through the use of hands in dealing with computer by presenting information, pictures, 3D graphics, audio and animation to form a virtual world similar to the real world.

Applications of virtual reality:

There are many applications for virtual reality and one of the most important applications is the virtual medical imaging where medical imaging of patient's organ is used via computer to avoid diagnostic endoscopy procedure. The results of magnetic resonance imaging (MRI) and computerized tomography (CT scan) are fed into computer to form an accurate 3D picture of the intended organ. An angled beam of light is directed through the organ to visualize it via the computer using special graphic software. This allows the surgeon to see a clear and accurate picture of the organ environment that enables him to study tumors locations or injuries and consequently speculates the appropriate treatment. The information and pictures appears on computer screen away from the patient's body without using any invasive endoscopic procedure. Scientists also developed a new procedure to diagnose colon and intestinal cancer without any surgical intervention or insertion of diagnostic instruments. This was achieved via virtual reality technology using the computer. The new procedure does not require any anesthesia or surgery and can be performed in 2 minutes where the colon is inflated by carbon dioxide gas to fully extend it and open it, allowing doctors to discover malignant tumors. Segments of the colon are then scanned by CT scanner and the 3D pictures of the colon are displayed using computer software showing the details of any inflammation. The suspected area of the colon can be magnified and the colon can be virtually dissected and rotated to examine the gut walls. In addition, a virtual endoscope can be inserted in the colon lumen to examine its interior.

This technology will exempt patient from the suffering he might encounter if the real endoscope was used.

Advantages of virtual reality in education:

a. Using virtual reality, we can generate artificially realistic or imaginary environments that can be interactively explored as the case in the natural environment.
b. The simulation using virtual reality is an excellent alternative for reality in teaching and training students. It is devoid of dangers that could happen in real life training such as flight simulations.
c. The ability to visualize concepts and status and introducing the student to situation he usually hardly see in reality.
d. By the mean of virtual reality technology, medical students and physicians can perform physical examination probing the deepest parts of the human body to get acquainted with its anatomy and organs.
e. The virtual reality is an effective technique in transferring technical information using pictures and diagrams which are more accurate for certain technical operations.
f. Virtual reality allows the students to conduct practical experiments step by step.
g. The use of virtual reality technology in classrooms will lead to the encouragement of students to overrun their lecture passivity.

VI. Clinical Skill Laboratory in Medical Education

The first Clinical Skills Laboratory (CSL) was established in 1976 in Maastricht, the Netherlands, Limburg University. It has then spread to become an integral part of a clinical competence [(1)]. Around the world, several medical schools and other health care professions have integrated CSLs in their curricula [(2)].

A CSL is "a facility in which students and qualified staff learn clinical, communication, and information technology skills to a specified level of competence prior to or coordinated with direct patient contact" [(2)]. The purpose of the CSL is to support the acquisition, maintenance and enhancement of the clinical skills of students in health care professions. They provide hands-on learning experience for the practice of clinical skills, which are deemed essential for effective and safe management of future patients. In addition, these labs help to ensure that all students have the necessary learning opportunities and appropriate assessment before approaching real patients [(2)]. Within this non-threatening and safe environment, patient volunteers, simulated patients, manikins and information technology are employed to provide hands-on learning experiences for the practice of the essential clinical skills. The skills laboratory helps to ensure that all students have necessary learning opportunities and appropriate assessment and feedback before approaching real patients [(3)].

The shift of patient care from hospital to the community and home and the shorter and more secure patients in the outpatient's wards made teaching clinical skills in inpatients and outpatient more difficult. Although health care teaching has shifted to ambulatory care, many clinical skills are not suitable for teaching in the outpatient setting. In hospitals where patients are available for teaching, using sick patients as teaching aids is far from ideal. It was found that a substantial proportion of medical students enter their internship

year without any basic skills experience [4]. This affects the quality of care interns provide, weakens the confidence of nursing and medical staff in new graduates, and poses a significant source of stress for many junior doctors [4, 5]. Other report showed that relying solely on clerkships to provide students with skills training is inadequate.[6] Others also have shown that medical students typically acquire their basic skills on the ward from interested registrars in an ad hoc opportunistic manner. Subsequently medical graduates often enter their internship without ever having received any formal training in some basic skills.[7,8]

With the constrains of patients in the medical education, many developments in health care delivery, medical and nursing education have led to the proliferation of CSLs or centers in many schools. These labs have the advantage of being effectively used in the undergraduate and postgraduate education, continuing medical education and continuing professional development in addition to other health specialties education. In CSL, a variety of standardized clinical approaches are used for students to receive complementary training in a systematic, safe and protected way using effective educational strategies appropriate to their educational needs and level of experience.

Simulated Patients and CSL:

CSLs cannot be well equipped without the presence of a good bank of simulated patients (SPs) in the proper setting. SPs are used to help training students to recognize illness, to take history, to break bad news, to counsel and develop a caring attitude and to learn examination techniques. SP's have the opportunity to role play a number of illnesses such as back pain, eye problems and hearing problems. Training programs have been specially developed for this purpose.

The University of Dundee's Simulated Patient (SP) Program began in 1997[9]. SP's have provided a very valuable role in the development and training of healthcare professionals for the Schools of Medicine, Nursing and Midwifery and Dentistry and Allied Health Professionals. The Clinical Skills Centre, where the program is based, offers a real clinical setting for students to learn. There are consultation rooms, demonstration rooms and ward areas as well as video recording and video teleconferencing facilities. SP's are recruited and trained to portray diseases and medical conditions and are then used to test students in a clinical setting.

A number of medical schools had used standardized patients in the instruction of medical students in the following skills including [10].

- history-taking
- doctor-patient communication skills
- general physical examination skills
- specialized physical exam skills, such as the gynecologic or urologic exam

Importance of Simulated (Standardized) Patients:

- Convenience – SPs provide the cases at the time and in the place they are needed by the students and teachers.
- Direct comparisons of competence – SP evaluations allow a direct comparison of students' clinical skills. Previously, direct comparisons among students could only be done in the cognitive domain.
- Compression/expansion of time – Use of SP simulations allows students to have a longitudinal experience with patients and to follow a case in a compressed time frame.
- Safe practice – Simulations allow students in the clinical situations that they could not manage alone in a real clinical setting.

- Efficient use of physician faculty time – A physician can train a number of SPs who can then teach/evaluate students. This leaves the physician free to concentrate on specific areas where his/her expertise is most useful.
- Well formed SP are reliable and accurate in their evaluation of students' performance.
- Increase clinical examination validity and reliability in order to make a general estimate about clinical competence.

Advantages of CSLs: [2,11,12,13]

1. It is a setting which allows students to learn at their own pace in a non-threatening and safe environment.
2. Allows early practice of difficult, painful and embarrassing procedures in a supervised environment with enjoyable and valuable educational experience.
3. Students can afford to make mistakes without the risk of emotional reaction to real patients.
4. Using manikins, students can repeat procedures as often as they like.
5. Students' educational needs can be met, and their fear and anxiety of real clinical encounter can be alleviated.
6. They can also focus on individual skills in a controlled manner.
7. Learning in a CSL provides standardized experience to all trainees.
8. The social and ethical problems are overcome when students learn intimate examination skills in the CSL.

9. Most skills labs are equipped with video recording of history taking on SPs. Using SPs in CSL is consistent, reproducible and adjustable to match the stage of training of the

learner. Unlike real patients, they are available when and where needed and can be used for several candidates consequently without risk of altering their presentation.

10. Video recording of interviews allows feedback on history taking and interviewing skills, which improves their communication skills in practice and allows students to reflect on their own performance.
11. The CSL provides a wide range of learning skills for undergraduate students and builds confidence in their capabilities.
12. CSL allows a longitudinal integration between basic and clinical sciences, which is ideal for an undergraduate health specialties curricula.
13. CSLs are flexible for use in different settings and for different purposes. They could be used for undergraduate and postgraduate education. They could be used to teach cognitive, psychomotor skills and attitudes, variety of clinical skills, patient problems, professional and ethical issues. Students could participate in self-directed learning and self-assessment.

Disadvantages of CSLs: [2,11,12,13,14]

1. The main disadvantage of the CSL is its high cost of purchasing, maintaining and updating of materials and equipment. It can be very expensive if high fidelity systems are used.
2. In CSL's where teaching takes place by analyzing pre-recorded videotapes and using CD ROMs, there is always a risk of technical problems.
3. Although the use of SPs was proven to be a useful learning aid, some clinical signs are impossible to simulate.
4. Students are generally fascinated with the hospital environment and are more keen on real patients. This can affect their enthusiasm on learning in the CSL.

5. Skills which are not taught correctly will continue to be poorly practiced. Clinical skills sessions may follow traditional education models if not well designed.
6. Students may feel little worried at the start of CSL implementation due to adoption of unfamiliarity with new education approach.

Conclusion:

In summary, the CSLs are not luxuries but necessities for all medical colleges. Most of our medical colleges are having these CSLs, but are not well equipped; lack some essential equipments, staffs and facilities. Recognition and acceptance of the importance of CSL in students' skills training by college authorities, staff and students are the key in its implementation. Appropriate planning, management and resources are also required to ensure proper setting-up. For academic and professional effectiveness, frequent and continuous evaluation, staff training and student support system should be part of CSL. A skill laboratory needs to be an integral part of the curriculum and relevant to education and training objectives. A successful CSL should be flexible and tailored to the local needs.

References:

1. Sebiany A M. New trends in medical education. The clinical skills laboratories. Saudi Medical Journal 2003;24 (10): 1043-1047
2. Ledingham McA, Harden RM. Twelve tips for setting up a clinical skills training facility. Med Teach 1998; 20: 503-507.
3. Hamo IM. The role of the skills laboratory in the integrated curriculum of the faculty of medicine and health sciences, UAE University. Med Teach 1994; 16: 167-177.
4. Culhane A, Kamien M, Ward A. the contribution of the undergraduate rural attachment to the learning of basic practical and emergency procedural skills. Med J Aust 1993; 159: 450-452.

5. Tong S. Leather, oranges, dead pigs and needle stick injuries. Med J Aust 1996; 166: 683-687.
6. Remmen R, Derese A, Scherpbier A. Can medical schools lie on clerkships to train students in basic clinical skills? Med Educ 1999; 33: 600-605.
7. Taylor M. Undergraduate procedural skills in Victoria: Is it adequate? Med J Aust 1997; 166: 251-254.
8. McMahon DJ, Chen S, Mac Mallan DG. Formal teaching of basic surgical skills. N Z J Surg 1995; 65: 607-609.
9. http://www.dundee.ac.uk/clin skills/links.php
10. Barrows H. An overview of the uses of standardized patients for teaching and evaluating clinical skills. Ac Med 1993; 68 (6): 4430453.
11. Bradley P, Bligh J. One year experience with a clinical skills resource centre. Med Educ 1999;33:114-120
12. Hamo IM, Das M, Lanphear J. The skills laboratory as viewed by medical students. Annals of Community-oriented Education 1994; 7: 309-315.
13. Al-Yousuf NH. The clinical skills laboratory as a learning tool for medical students and health professionals. Saudi Medical Journal 2004; 25 (5): 549-551.
14. Issenberg SB, McGaghie WC, Hart IR. Simulation technology for health care professional skills training and assessment. JAMA 1999; 282: 861-866.
15. Harden RM, Sowden S, Dunn WR. Educational Strategies in curriculum development: Med Edu. 1984; 18 (4): 284-97.

VII. Teaching & Learning

It will be discuss under the following headings:

- Teaching Practice.
- Feedback for teachers "Assessment of the quality of teaching".
- Evidence-based Medical Education (BEME).
- Clinical Teaching.

A. Teaching Practice:

The key principles of build teaching practices are:

Before the session:

1. Teachers should set clear objectives for the course and make sure that they match with the contents and assessment methods. Learning is not conducted in vacuum. Learners have needs, goals and purposes which provide important motivators for learning and for the setting of future goals. Many decisions about what to learn result from long-term goals which may have been established much earlier. The advantages are clear to both teachers and learners; the learners may add or remind the teachers of other objectives; they may refine the objectives stated by the teachers. The students are more likely to be interactive with the teachers during the discussions and satisfied with the outcome as they will not have some assumptions about certain topics to be covered which are not part of the course objectives. It will be easier to evaluate the course if the objectives are clear. The possible obstacle is that when the courses are taught by a group of teachers (some of them are not updated or educated about the principles of learning and teaching), it maybe difficult to reach a consensus between the groups.

2. Curriculum Content

a. The students should have a say in the curriculum content. When the material to be learned is personally relevant, and when learners are responsible for their own learning, learning outcome improves. Significant learning, it is argued, only takes place when learners choose what they want to learn, how they meant to learn it and when they want to learn it. The advantages are i-the learners will be more satisfied, motivated and active ii-the curriculum will cover only important areas and topics likely to be met in real life. The possible disadvantages are that i- the teachers require more work and efforts to prepare the content selected by the students ii- some teachers may feel insecure or uncomfortable to discuss those topics iii-the curriculum may not include essential material for the course. For this reason, the curriculum content should stem from negotiations between students and teachers or course organizers.

b. The topics of discussion should build on what the students already know. The activation of existing knowledge is a starting point for switching on to the correct wavelength. For people to acquire something new; it must be meaningful. The job of the teacher is to show how new material fits in with what has gone before, and to indicate in what ways it is new or different. There is ample evidence to suggest that students often have problems with material simply because they do not have the understanding of pre-request concepts or principles (schema activation). A pre-test to assess understanding of pre-request concepts and principles is a good practice. The basis for this is learning with understanding (part of the cognitive theory). This principle requires from the teacher early preparation and planning before the session and also in case the pre-test is conducted at the start of the teaching session, he should be flexible to move the direction of discussion and

group work to cover areas of pre-requisite concepts and principles which may represent a challenge and load on the teacher.

3. Teachers should Plan for perceptual stimuli:

One example is to provide the students with handouts before the session requesting some exercises or tasks to be answered and leaving some space in the handouts to be filled out by the students. The advantage of this principle is that it will lay down the structure of the session to the students in advance and provide an appropriate illustration. Furthermore, students are likely to cover the pre-request concepts and principles and increase their cognitive engagement and ultimately improve learning. However, to achieve this goal, it needs early planning and preparation from the side of the teacher.

During the session:

1. **Teachers should make the learning environment non-threatening and safe**. The students should feel secure for questioning and debate. This is an example of theories of motivation, personality and social psychology. The advantage is that learning which involves the emotion and feeling as well as the intellect is the most lasting and most pervasive kind (Carl Rogers 1983). Significant learning only takes place in non-threatening environments. The disadvantage and possible problems include*:*
    a. Some students may abuse this freedom and be insensitive to the group work and emotions so they may disturb the flow of the discussion and work and cause frustration.
    b. The content and the amount of material covered may be limited.

2. **Teachers should encourage the students to participate actively during the discussion.** Provide students with assignments or activities that call for problem-solving. People learn better if they participated in the discussion and the construction of the model (schema construction) and in summarizing the topic (Schema refinement). Perhaps one of the most useful activities for the students to undertake is to make a summary in their own words of the main thrust of the session and to annotate this in relation to previous learning and possible future applications.

   The schema activation, the schema construction, and schema- refinement model for teaching, coupled with encouragement of students to engage in deeper processing and thinking give us a credible and robust basis for our teaching.

   Other techniques rely on activities that require students to be self- insightful or to use 'meta cognitive' strategies – about their learning. Such, for example, would include: Think –aloud modeling, where the teacher 'meta cognizes' out loud to the class while performing a complex activity, such as composing an essay on an overhead, where all can see and hear the writer in action.

   The advantage of this principle is that learning improves as the quality of cognitive engagement increases and declines as the quality of engagement decreases. Students' active participation during the discussion is enjoyable to both teachers and students. The disadvantage of this principle is that it demands more effort and patience from the teacher and the material covered is less than the traditional teacher- based instructional methods. Some teachers may feel insecure.

3. **Teachers should use reward and reinforcement for the students for some of the well-done tasks and provide them with feedback.** Random positive reinforcement is

probably more effective than encouragement for every task (Skinner). As Hilgard and Bower put it, it is generally found that positive controls (rewards, success) are to be preferred to negative controls (punishment, failure). The principle is apparently simple and is easy for educators to master and put to good use. The disadvantage of rewards is that some students may have a false feeling of security and may overestimate their abilities so this point should be considered. On the other hand, punishment may put down not only the student punished, but also the whole group.

4. **Teachers should be prepared for the differences between students regarding their speed and styles of learning.** The advantages to the students in general and also to the teacher are clear, however the fast learners may be frustrated because of the slow speed of the discussion, this may also limit the amount of material covered and the teacher needs to exhibit patience.
5. **Teachers should serve as role models for the institute values and ethics :** The teacher should be committed and caring for his students. Examples of teacher lack of commitment is setting work and not collecting or marking it. Lack of commitment from the teacher's part encourages surface learning. The student needs not only an intellectual development but also an ethical development and professionalism.
6. **Teachers should develop and stimulate curiosity among their students.** This will hopefully produce a reaction to learning conductive of deep learning. Human beings (curious beings) have a natural propensity for learning. Inquiry methods of teaching either start with existing interests or the student is presented with baffling demonstrations or paradoxes.
7. **Teachers should present the information in structured and organized way:** We need to have carried out for ourselves some forms of topic analysis so that we are aware of how the different parts of the material relate to each other. What needs to

come before and where understanding of one concept is dependent on prior understanding of another?

After the session:

Teachers should develop assessment procedures that measure the organization and utilization of knowledge and examine the thinking process, and deep learning and does not focus on the assessment of information recall and rote learning.

The assessment is a very strong stimulus and motivator for learning and it has a significant impact on the learning and the curriculum. The assessment method should be fair and clear to reduce anxiety and direct learning to the desired outcomes.

B. Feedback for teachers "Assessment of the quality of teaching."

The assessment of the teaching session, whether it is didactic or clinical could be any of the following:-

- Invite one of the colleagues to attend and assess teaching skills (peer assessment).
- Videotape teaching sessions and see it alone or with one of your colleagues or students. This can be a particularly informative technique for evaluating the teaching performance.

Benefits for assessment of the quality of teaching:

1. Identify strong and weak areas in the teaching skills. Some items in the feedback of the students may help to have insight into weak areas in communication skills and attitude.

2. The relationship with the students will hopefully improve.
3. With repetition and feedback, the teaching skills will improve and the benefit will extend to students and trainees.
4. Furthermore, with the involvement of medical students and colleagues, this exercise is expected to disseminate the idea of self assessment and improve the educational climate of the institute.
5. It will support teachers' personal growth and professional development.
6. Promoting better teaching in the ambulatory setting is very important to enrich the students' learning experience and to complement their learning in the inpatient setting.

Problems associated with assessing the quality of teaching:

1. It is time consuming and sometimes boring to look at videotape record of the teaching sessions.
2. The students may give higher scores to their teacher in order to please him or her or because of shyness; this bias might lead to false reassurance.
3. The colleagues that will used for comparison, might be biased as they are not familiar with a teaching methodology so may give high scores.
4. Colleagues might dislike the method of self-assessment and therefore may not cooperate and may affect the relationship.
5. Students may not appreciate the benefit of this exercise and consider it as a waste of their time.

C. Evidence-based Medical Education (BEME):

Research into teaching and learning in medicine' 'has its impact at the bedside, in the consulting room and in the wider community. The need for evidence-based medical education (EBME) is highlighted by many authors who suggest that 'the evidence base is as important in educating new doctors as it is in assessing a new chemotherapy'. The implementation of BEME offers a significant challenge to the traditional culture and practice of medical teachers, particularly in view of its undoubted attractions to the educational bodies desperate to improve efficiency and effectiveness of medical education. Like many radical innovations, BEME seems a commonsense notion to many people until they come to face the myriad practical difficulties of changing attitudes and behavior.

Arguments put forward for the development of evidence-based teaching include:

1. Educational practice is currently frequently governed by traditions and intuition. This presents problems. Van de Vleuten and colleagues (2000) argue that. 'Particularly in education, tradition and intuition can actually be misleading and that empirical evidence often contradicts our suppositions and beliefs'.

   'The realization is growing in Europe and North America that teaching and learning in medical education have come to a fork in the road. The choices are for teachers to continue down the road of opinion-based practices or to take the fork that leads to evidence-based education and a more scholarly approach to teaching and learning. We urge the latter.

2. We are living in a time of change-change in health care delivery and in medical education. We need evidence as to what should be changed with respect to our current

approached to teaching and learning and which new approaches and methods should be adopted and how they can be introduced more effectively.

3. The educational interventions that are proved by research as part of the BEME are more convincing to educators and likely to be adopted easily.
4. Getting the best available approach to teaching is associated with better results and learning from the side of the students as consumers and is a better use of resources.
5. As part of a general trend, there is a move to accountability and quality assurance. This brings with it the need for greater justifications of the approaches adopted in teaching and learning whether in respect of curriculum planning or management, teaching methods or assessment.
6. A move to evidence based teaching will encourage more and better research into medical education. There is a need for collaboration between the teacher and the researcher. 'A closer collaboration between those who use the interventions and those interested in studying them could help to overcome a number of obstacles.

D. Clinical Teaching:

Feature of an effective clinical teacher include group instructional skills, attitudes to patients, applied problem solving, student-centered instructional strategies, humanistic orientation, the subject expertise and a challenging approach.

Modern trends in clinical teaching:

- Move from student centered to patient centered approach
- Move from apprenticeship to Systematic approach
- Multi professional aspects

- Focus on the clinical setting
- Reflective practice.
- Early introduction to clinical practice.

Student centered to patient centered Approach: An example of patient centered approach:

In the last two years of the school, it is advisable that students start the attachments after they had passed through the "skills lab" in the medicine and surgery rotations; they practice history taking among themselves and simulated patients (SP) and physical examination over the models and manikins.

At the start the students will be helped to learn the consultation skills through video and role play among themselves in the presence of a facilitator. The use of trained SP or some computer simulations programs that have immediate feedback will be used too. This will hopefully enable students to practice individual consultation skills safely without affecting patient care. The SP could be requested to provide students with feedback on their strengths and weaknesses in relation to the care of patients

The students will be exposed to teaching clinics (ambulatory care training centre) whereby volunteer patients will be seen in a safe environment without adversely affecting the outpatient clinic flow. This will be under the supervision of an assigned facilitator.

Later on, students will see selected patients attending the outpatient clinic of the hospital and the community health centers. At the start they will observe their teachers; then the teacher would observe his or her students to be able to provide feedback.

Apprenticeship to Systematic Teaching: The learning outcomes (Aims and Objectives) are specified. They will be made known to the students and the supervisors.

A study guide will be provided to the students and teachers alike to ensure that the outcomes and competencies have been achieved by all students. The study guide facilitates the student's learning by acting as an advance organizer by activating their prior learning.

The use of portfolio as a tool for assessment and learning helps to make the learning structured and puts the learning responsibility on the students.

Multi professional aspects: Arranging a lecture or tutorial with a dietician or nurse in addition to a physician for example to medical students to discuss their roles can enable the students to understand other professionals' roles. This will hopefully help them to have a positive attitude and to interact in a collaborative way with the team in the delivery of a high standard patient care.

The students may be requested to sit with two of the health team members to describe their role and how to improve the collaboration with the doctors as part of the portfolio.

Focus on the clinical setting: Students should be encouraged to participate in the consultation and clinical practice as soon as possible but this should be done in the presence of their teachers so that they can discuss the issues raised in the consultation and provide feedback.

Reflective Learning: Competent medical students continually reflect on their clinical practice, critically analyzing and evaluating their own clinical decision making, their interactions with patients and team members. This constant reflection allows learning from every opportunity offered by the clinical environmental. Schon (1991) identifies two types of 'reflection':

- Reflection-in-action.
- Reflection-on-action which happens after the experience enables learning about clinical practice and promotes developments of such practice. Reflection consists on of describing what happen, the feeling, evaluation of what was good and bad?, Analysis and how can the learner do better next time?.

Reflective learning may be facilitated by the following measures:

- A structured logbook: used in random case analysis discussion. The logbook should contain not only a description of the patients but also what was learnt and what further learning should take place and how a similar consultation could better be handled in the future.
- The portfolio should include not only evidence of achievement of a certain learning issue but also reflection.
- The use of short structured discussion that encourages reflection such as the One Minute Preceptor ship which consists of Five Micro skills:

    1. Get a commitment - *What do you think is going on?*
    2. Probe for supporting evidence - *What led you to that conclusion?*
    3. Reinforce what was right - *Specifically, you did an excellent job of…*
    4. Teach general rules – *The key features of this disease are...*

5. Correct mistakes- *Next time this happens try this...*

- The inclusion of videotaped consultations in the portfolio and asking the students to reflect on the strong points and points for improvement in addition to peers and tutor assessment.
- During the discussion, the use of open/ reflective questions and the appropriate use of silence.

Early introduction to clinical Practice:

- As a corollary, the tutors and the students will discuss encountered health problems immediately particularly if they are from the specified learning outcomes. The advantage of this approach is that it is associated with relevance to the topic discussed due to the stimulus of the health problem and the identified learning needs.
- The tutors should recognize that using patients for teaching should not exclude discussion and learning about basic theoretical aspects of disease such as the pathophysiology of diseases.

VIII. Principles and tools of Assessment

1. General rules on Assessment:

1. Assessment of students has a profound impact on their learning. If you want to change the learning process or the curriculum, this could be achieved through introducing changes on assessment. Every act of assessment gives a message to students about what they should be learning and how they should go about it (Boud:1995).
2. It is highly advisable to use more than one method for the assessment of any particular candidate or group of candidates because the different tools tend to complement each other. Furthermore, item writers, will be influenced in their selection of topics for a test when only a certain format is allowed for. They will then neglect certain important topics because they cannot be asked about easily.
3. Criteria for good assessment tools.
    a. **Validity:** Extent to which a test measures what it's supposed to measure. Does the test measure the specific trait/property/ characteristic we intended to measure? Does it serve our purpose/ our intended use? There are different types of validity (content, predictive, concurrent, construct and constructional validity).

Considerations in Assessing Test Validity

Consideration	Questions to be Answered
Content	How well does the content sample the course
Test –Criterion relationship	Predictive validity :How well does the test predict future performance
	Concurrent validity : How well does the test estimate current standing.
Construct	How well test performance reflect psychological attributes?
Consequences	Positive and negative consequences resulting from using test results e.g. narrowing learning

b. **Reliability:** means consistency, repeatability or reproducibility. It asks how precise /stable/ consistent/ dependable are the results?

c. **Educational impact**

d. **Cost effectiveness**

e. **Acceptability**

4. Table of specification: it is highly advisable to have a blueprint (table of specification) to make sure that the assessments covers all the contents and sample from all the domains. For example the internal medicine exam for final year medical students may have a blueprint similar to shown below.

Branches	Health Maintenance	Mechanism	Diagnosis	Management	Total
CVS	3	4	9	9	25
Renal	1	3	4	4	12
Respiratory	2	3	8	9	22
Gyn/Obs	1	3	5	4	13
Preg/delivery	3	2	3	5	13
Skin	1	0	3	2	6
Blood	1	3	3	4	11
Mental	1	2	9	5	17
Nervous	1	5	8	7	21
Total	14	25	52	49	140

2. Different types of assessment:

1. <u>The progress test:</u>

Assessment must focus on the definition and evaluation of student progress to ensure that trainees are 'on track' in achieving the outcome objectives.

A progress test is an assessment tool, administered on multiple occasions, in order to measure progress relative to previous individual test performance. Incremental gains of knowledge and abilities through the curriculum phases are the units of measurement

(Ben David MF. Principles of assessment. In Dent JA and Harden RM. A Practical guide for medical teachers. Elsevier Churchill Livingstone. Edinburgh 2005).

Three main factors may influence students' progress (Brown et al 1995).

- The logical structure of concepts within each discipline.
- The sequencing and nature of teaching and activity both within and outside the school.
- The changing motivation and intellectual growth of the student.

2. Mastery testing:

The purpose of mastery testing is to indicate whether an individual has mastered a given subject, in other words, whether they have attained a 'mastery' level of achievement. Mastery testing requires that 100% of the items are answered correctly. In non-mastery testing, in contrast, a cut-off point of 65%, for example, might be set: attainment of 65% of the tested material is considered sufficient.

The concept of mastery testing stems from criterion-referenced tests, first proposed by (Glaser and Nitko 1971). In criterion-referenced tests, individual performance is judged by the degree to which an acceptable standard is attained in the test material ('assessment to a standard'). This is different from norm-referenced testing in which an individual score is interpreted relative to the scores obtained by others on the same test. Commonly, the purpose of norm-referenced testing is to discriminate between low- and high-performing students. Consequently, norm-referenced tests are used mainly for selection purposes. The tests are designed to include range of item difficulty which usually results in a normal distribution of scores. Norm-referenced tests show up differences between individuals and score variability is built into the test.

In contrast, mastery tests may contain only easy, but essential core items. In an ideal situation all students may attain a score of 100%, resulting in zero variability among scores with no individual differences. However, due to measurement error and other confounding factors, it is reasonable to set the mastery level score at 85%.

Results are usually categorized as 'mastery' or 'non-mastery'. Students who did not attain the mastery level may return to take tests as many times as needed to reach mastery. At the end of the instructional unit all students are expected to achieve the same score.

3. Global rating scales:

Global rating scales are measurement tools for quantifying behaviors. Rates use the scale either by directly observing students or by recalling student performance. Global rating scales are distinguished from other rating forms in that raters judge a global domain of ability for example:

- Clinical skills.
- Communication skills.
- Problem solving etc (ACGME 2000).

When simple recording of discrete behaviors is needed, for example evaluation of taking a blood pressure, a checklist will be a more appropriate method. Specific behaviors are listed, and the rater makes a binary decision, 'yes' if the behavior was demonstrated, and 'no' if the behavior was not demonstrated.

Both checklists and global rating scales are commonly employed in methods such as the objective structured clinical examination (OSCE). For some checklists, where little

clinical judgment is required, non-clinicians, usually standardized patients, are employed as raters. Global ratings fall into two main categories:

- Behaviorally anchored scales.
- Likert scales.

Behaviorally anchored scales.

Smith and Kendall introduced the concept of the 'behaviorally anchored' scale in 1963. the scale is constructed by describing examples of behavior, called 'anchors', from the domain under study, and a group of experts rank the behaviors on a scale from low to high. Numerical values are assigned to each anchor to provide a score.

Behavior descriptions can also be developed, using the critical-incident technique (Rhoton 1989). In this technique, a series of interviews are carried out with students or faculty, investigating, for example, a communication domain. Students are asked to identify incidents where communication was exceptionally good/effective and incidents where it was bad/ ineffective.

The behaviors are then analyzed and aggregated into several aspects of the domain. For each aspect, behaviorally anchored descriptors are developed.

The number of points on the scale is determined by the number of anchors and by the ability of the rater to discriminate among the points on the scale (Spector 1992). In some cases (see, for example, the table below) the scale is grouped into three main anchors, with three scale points assigned to each anchor; this allows the raters flexibility in choosing a point on the scale for each anchor.

The table below is an example of an anchored scale for one aspect of skills in communication with patients, that is, sensitivity to the patient's concerns.

Table Behaviorally anchored scale: communication skills with patients.

Low	**Sensitivity to patient's concerns**	**High**
1 2 3	4 5 6	7 8 9
Lack of sensitivity to patient's problem, does not follow up on patient's concern	Concentrates mostly on the medical problem with some questions related to patient's concern	Is skillful in integrating questions regarding the medical problem and patient's concern

Other aspects of communication with patients might concern empathy or sensitivity to the patient's understanding, for example:

Likert scales

Another global rating technique was developed by Likert (1932). Raters mark behaviors on a continuum, for example from 'excellent' to 'poor'. A numerical value is assigned to the categories. Likert scales are commonly divided into agreement scales (agree – disagree), evaluation scales (excellent-poor) and frequency scales (never-always). The scale points in these three categories are arranged on a continuum from low to high. The number of points may vary based on the construct measured (Spector 1992).

4. Multiple choice questions (MCQ)

This type of tests represents one of the most important examination tools that are commonly used in educational assessment. Proper understanding of this type of examination is essential for the adequate design, management and interpretation of this type of tests. There are different types of MCQs, each type has its own innate advantages and disadvantages. Selecting the most appropriate question type therefore

requires careful weighing of it's pros and cons. The inclusion of the single best answer stimulus rich (with scenarios) MCQ types is advisable as they encourage higher cognitive levels of thinking.

5. Self assessment

Boud (1991) defines self assessment as "The involvement of students in identifying standards and/or criteria to apply to their work and making judgments about the extent to which they have met these criteria and standards**.**

Self assessment is about evaluating ones' own performance and comparing the result with what should be happening. Good professional training equals good self assessment. Students should be encouraged to recognize what is a quality performance and to take more responsibility for each stage of their work. They should be able to establish for themselves how well they are doing in terms of their training goals.

If the students know that accurate self assessment will have a direct effect on the quality of their learning, they will invariably become "users of the' technique". Self assessment can:

1. identify strong and weak areas in student's understanding and skills.
2. identify strong and weak areas in the teaching program.
3. help students perform better as repetition and feedback practice enhance the development of knowledge and skill while discussion and involvement in the development of the rating scale is associated with deep learning.
4. help students critically examine their own work and to realize if it meets the required standards and an appreciation of what "quality work" means.
5. improve the consultation skills for future and present health professionals which is a great gain for the society and is one of the goals of health schools.

6. support teacher growth and enhance student learning and finally it must be viewed as an integral part of professional development.

6. Portfolio

A. Definition of portfolio Evidence Based Medicine (EBM) Report :

A portfolio is a collection of student work, which provides evidence of the achievement of knowledge, attitudes, understanding and professional growth through a process of self-direction over a period of time. The components of the portfolio (the material that the students might include in their portfolios as evidence of achievement of the course outcomes) could be anything that fits the course objectives. For example, for fourth year medical students it could include any of the following:

1. C.V. (optional)
2. Supervisor (trainer) report.
3. Manchester rating scale to assess the clinical skills e.g. history taking and examination. The scale should be completed by the student (self assessment), colleagues (peer assessment) and the supervisor in the clinics.
4. Log of procedures with signatures from a teacher who witnessed the incidence.
5. The Calgary- Cambridge scale to assess the student consultation skills using a video of a consultation with a patient or simulated patients using (tutor/self and peer assessment.
6. Student presentation of a topic.
7. The student learning diary. The students would write their objectives at the start and then reflect on what they achieved. They would answer the following questions 1. what did I learn? 2. What do I still need to learn? 3. What resources did I need to use for further learning? 4. What further learning was achieved?

8. Counseling skills. To assess the counseling skills, the student is requested to present a video for counseling of a standardized patient (SP) who is having a risk factor e.g. smoking or hypertension or a disease for which prevention is important (like diabetes or bronchial asthma).
9. Evidence based Medicine (EBM) Report.
10. EBM presentation.
11. Five cases reports.
12. Professionalism scale.

A. Table of specification (blue print).

One of the important concepts of assessment is proper sampling through the use of table of specification.

Selection of assessment tools versus the course objectives.

Blue Print (Table of Specification)

Learning outcome Assess Tool	Plan management of common problems	Communication and consultation skills	EBM	Personal and professional growth	Attitude and ethics
C.V.					
Supervisor (trainer) rating scale	*	*		*	*
Manchester rating scale	*	*			
Procedures log				*	
The Calgary-Cambridge scale		*			
Student presentation of a topic (either from PUNS and or from DENs)	*		*	*	*
The student learning diary		*	*	*	*
Video of counseling	*	*		*	*

skills					
EBM Report			*	*	
EBM presentation			*	*	*
Five cases reports	*			*	
Professionalism scale				*	*

As it is shown in the blueprint, each portfolio component (assessment tool) fulfills some of the learning outcomes (course goals). It is noteworthy to mention that the CV does not directly cover (assess) any of the learning outcomes (that why it is optional for the students). It may be useful for the reviewer to have an idea about the student interests, hobbies and his past achievements. They may act as a starting point for the discussion. It may be also useful for the students to learn how to present themselves for future needs like application for jobs or training posts.

For the candidate to benefit from such on-going assessment, the portfolio supervisor of each candidate must have regular review sessions to discuss the rating with the student and monitor the student progress towards the curriculum learning outcomes. Supervising a student, who is building a portfolio, is similar to the supervision of Master or PhD students. It also includes a monitoring role.

The assessors rate the student achievement of the learning outcomes on rating scales, anchored with precise and specific descriptors of behavior at each part on the scale. Such rating scale rubrics help benchmark the passing standard in the standard setting process of portfolio assessment.

The strengths of the portfolio are as follows:

i. It focuses on personal attributes through showing evidence of student learning and feedback. Example of this is the student learning diary which include what did I learn, what do I still need to learn and what resources I need to use for further

learning? It contextualizes learning and links experience worth personal interpretation.

ii. It enhances interactions between students and teachers. The interaction is likely to take place in most of the portfolio items (materials). A clear example for this is EBM Report and presentation whereby the student needs to have meetings with their supervisor.

iii. Stimulates the use of reflective strategies. The best example is as mentioned before in the students learning diary.

- Facilitates the use of past experiences to define learning and to recognize progress.

- Stimulates the use of reflective skills in order analyze and synthesize experiences. Students can also describe and analyze learning strategies thus engaging in meta-cognitive processes.

iv. Portfolio allows learners to have ownership of their learning and development. Example of this is the EBM report and the video for counseling skills and consultation skills.

v. In developing a portfolio, the candidate through reflection identifies his/her own learning needs, identify resources for learning and evaluate learning outcomes. These are characteristic of adult learner.

vi. While other methods of assessment are usually compartmentalized. Portfolio allows students to integrate between theory and practice and integration of knowledge, skill and attitude.

vii. The reflection of own performance is one of the important component of portfolio facilitate trainees' learning from their experiences. This reflective learning skill is essential in the general practitioners work.

viii. Building a portfolio indirectly train individual to be systematic in their learning and record keeping. The example of this is student practice audit and log diary in addition to the learning diary.

ix. Students assessment in examination set up, is artificial or simulated, however portfolio is assessment in workplace at the top of the miller's pyramid (does and action). Portfolio assessment is authentic; it holds evidence of individual's skills, ideas, interest, and accomplishments. This could be seen in most of the portfolio components however, the best example is the professionalism scale which is filled by the student, peers, tutors and other team members (360^0 assessments). The other two examples are the video of counseling and consultation skills.

x. Competency in relation to professionalism is best assessed in real situation i.e. in workplace rather than in simulated condition.

The possible disadvantages of the portfolio are:

1. The teaching staff rejection or resistance of the idea. The person who brings of new ideas like portfolio have thought of, reflected and studied the idea for sometime. Therefore his or her understanding and comprehension of the topic should not be assumed to be similar to the people to whom it is a new idea. Furthermore, human beings (in general) do not like changes as it may create stress and sometimes in extreme cases bereavement.

2. Students' anxiety and confusion: This will be more prominent among the first batch of students. This could be minimized through assigning enough time for

explanation and to show them some examples for portfolio and may assign a mentor who is well versed in the topic of portfolio building.

3. Time strain: Adopting a portfolio for assessment may imply more time demand from the teaching staff particularly for reading the portfolio materials and for the oral interview.

   To overcome this problem and learning from Dundee experience, certain items need to be marked before submitting the portfolio folder such as the practice audit and log diary, the counseling video and the consultation skills video and the Evidence Based Report.

4. Students may feel that the portfolio is unnecessarily taking them away from their patients.
5. Integrity and Honesty: Students may use a job that is done by other, their colleagues in previous batching or from the internet. There must be a mechanism for testing understanding through the oral interview.
6. Difficult to standardize the portfolio content, because it is meant to be personalized. However structured guidance may help to control standard to certain extent.
7. Reliability of portfolio assessment generally low as compared to other type of assessment. This is because portfolio assessment is subject to human interpretation and judgment. The intra-rater and inter-rater stability over time in rating the candidate performance is difficult to maintain and reproduce. The reliability of portfolio assessment may be improved with examiners' training and clear definition of criteria.
8. Consequences of low reliability may affect pass or fail decision. While building up the portfolio, it is time consuming for the examiners as well the students.

Which of the learning outcomes could be better be assessed using the portfolio:

All the course learning outcomes could be assessed with the portfolio method. The last two learning outcomes namely personal and professional growth in addition to attitude and ethics are much better assessed using the portfolio.

It is a collection of various forms of evidence of achievement of learning outcomes plus student reflection on his experiences. It usually shows progress over time and the evidence could be at any form photos, cuttings, papers and videos. It encourages self assessment, reflection and feedback

The evidence in portfolios is limited only by the degree of the designer's creativity. Friedman Ben David (2001)

Portfolio and Learning Theories:

Knowles described the characteristics of adult learners ‘‘Androgogy’’. He made the following assumptions on how adults learn:

- Independent and self directing
- Accumulated a great deal of learning
- Value learning relevant with everyday demands
- Immediate problem centered approach
- Motivated by internal drives

All these assumptions apply to adults who volunteer to use portfolio learning. The third and fourth assumptions that he made apply very as learners select not only what they feel is very relevant and is a priority for their work or life but there is immediate application.

The Self directed learning (SDL) theory suggests that learners' tasks are within the learner control and learners accept responsibility for their learning. SDL is associated with deep learning skills and reflection. However, learner requires supportive environment. Portfolio fits with this theory to a great extent. In portfolio, the learner would identify his learning needs and decides the action plan and the strategies to respond to these needs. Later on, he would reflect on the experience and actively construct a new model suitable for his context.

One of the most influencing theories is the Constructivist theory (J. Bruner). It suggests that people learn best when they actively construct their own understanding. Learning is an active process in which learners construct new ideas or concepts based upon their current/past knowledge. The learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so. Schema is the building block of cognition and schema refinement is perhaps one of the most useful activities for the adult learner to undertake. It means to make a summary of what was learnt. This is exactly what happens in the building of the components of portfolio.

The Self efficacy Albert Bandura theory suggests four main sources of learning namely the:

- Performance attainment
- Observation of other people (vicarious experience)
- Verbal persuasion from a credible source (mentor)
- Physiological state

We should utilize from “Bandura theory” the third point “consulting a mentor” and getting feedback in addition to looking at others’ portfolio which is application of the second point “Observation of other people (vicarious experience).

Reflection is probably the most prominent activity of the portfolio building. It simply means revisiting the experiences one experience and extracting lessons and plan for future learning. Schon divides reflection into two parts

- Reflection in action
- Reflection on action

Reflection in action is what takes place at an unconscious level. In order for us to make positive decisions about our learning, reflection must be a conscious process and part of our learning cycle “Reflection on action”. Conscious reflection is a learnt skill and needs practice. It consist from the following processes self awareness, description, analysis, synthesis and evaluation. If you describe the event “what was discussed” and critically appraise your knowledge or practice in relation to the event and demonstrates interaction with the material and possibly a change in your knowledge or skills as a result of this event this strongly suggests that you are the reflective practitioner so often quoted in the literature.

7. The objective structured clinical examination (OSCE):

In order to overcome the poor reliability of clinical examinations, objective clinical examinations were developed in the 1970s and are gaining in use worldwide.

In the OSCE, candidates rotate through a series of stations at which they are asked to carry out a (usually clinical) task. In most stations they are observed (by one or more examiners) and scored as they carry out the task; in others they may interpret clinical materials (e.g. laboratory data, X-rays), write notes or answer questions.

The major difference from other types of clinical examination is that over the course of the OSCE, all candidates are given the same clinical and other challenges and assessed by the same judges using the same preset standards.

In a way, the OSCE is not an examination method; rather it is an examination format or framework into which many different types of test method can be incorporated. There are certain basic ground rules:

Advantages of multiple station examinations

- Since each station can test a totally different content area, the candidate's knowledge and skills over a whole range of topics can be tested. The psychometric evidence is good that testing in less depth over many topic areas gives a more reliable and valid indication of an individual's competence than testing in depth in one or two areas as in the use of long and short cases.
- As they test a wide variety of competencies – knowledge, skills or attitudes over a wide range of content areas, they force the use of different test methods – vivas, writtens, practicals, computer-based as appropriate.
- The breadth of content areas tested and the flexibility in test methods used allow testing to encompass not only knowledge and skills, but attitudes as well, e.g. a station may have a component that requires ethical decision-making.

- They allow the efficient use of limited resources, e.g. every candidate sees the same patient, the same computer and the same set of X-rays, so everyone sees them at different points in time, you need only one set of each.
- Since the items on the checklist and/or rating scale for each station are agreed upon by a group of experts before the examination and a scoring scheme is predetermined, the examination is more objective than subjective (i.e. the judgment of only one person).
- This type of examination, with its formalized marking and scoring scheme, allows specific profiling of each component by performance. This allows each student's performance to be profiled precisely, e.g. station by station, component by component (history-taking, physical examination, data interpretation etc.) and by knowledge, skills and attitudes.
- The real power of this type of examination lies in the ability of those responsible for teaching and testing to examine their trainees with imagination and forethought, in a reliable way, in areas seldom or never tested before.
- With care and planning, most learning objectives for most courses can be tested using this technique with the use of the table of specifications (blueprint)
- The OSCE allows very specific feedback, not only to the candidates, but also to those who taught them and to those who set the examination.

8. <u>Assessment in the middle of the course:</u>

The trend now is not to do the testing at the end of a long teaching. It is to treat the testing as a part of the teaching. The key for the correct answer should be provided but not on the same place to give a chance for thinking before seeing the answer. The Questions at the start may stimulate the learner to think about the answer and to look for it during the subsequent reading. The motivation created will foster the understanding of the topic and

enhance the concentration. Questions in the middle of the text are very useful as a timely feedback. If the student did not get the right answer, this will trigger him or her not only to look for the correct answer but also to reconsider the way he or she is learning. She will look for the reason. Is it because of low concentration? or other knowledge pre-requisite to the learning should have been achieved before attempting to read this chapter. The other benefit of assessment is that the candidate will feel involved and will introduce interaction. Questions at the end of the chapter are useful both as a feedback and stimulus for further learning. We should also remember that assessment usually attracts the attention of the students and have impact on learning so care should be taken in the selection of the questions.

Questions could be in many forms like stimulus rich (with case scenario) or stimulus-free (no scenario) and the response either open- ended or multiple choice format. The use of pictures in the questions is another thing that could be done. The choice of the questions type depends on many factors:

1. The expected learning outcome, for instance if the expected learning outcome is higher cognitive levels according to Bloom's taxonomy of learning objectives, the stimulus rich questions are more appropriate.
2. The familiarity of the author with the different types of questions.
3. The amount of space available for the chapter.

IX. Selection Criteria for Admission to Health Colleges

In many countries, doctors enjoy privileged status which makes entry to health colleges highly competitive. For example, the number of the applicants to the King Saud University Health colleges is around 4500 candidates. The available seats in these colleges are only 1500, which mean that the competition is 3:1. Selecting the "right" students is a challenge for the health schools and the subject of much debate. Most of the health colleges no longer select solely on the basis of high academic qualifications but include varied non-academic criteria like excellent interpersonal skills, evidence of compassion and concern for others, maturity, and a well-informed motivation for the health colleges. The aim is to identify personal qualities in potential students that will allow them to cope with the rigors of the health course and to become globally competent as health practitioners[1].

The In the recent past, the admission to the Saudi Health Colleges depends only on the academic ability i.e. high school passing grade, which should be $\geq$ 90%. On 28/11/1421H it was decided by the Ministry of Higher Education to add the "Achievement Test" which assesses students' the three years high school scientific subjects to the selection criteria.

We need a fair and transparent admissions system, for the health colleges where demand exceeds supply and where it is difficult for staff to select from a growing pool of candidates whose academic scores are high. The admissions systems should strive to use assessment methods that are "reliable and valid".

In this review we will discuss the admission criteria in different schools in Saudi Arabia and internationally. We have identified the stated criteria for admissions, the tools with which such criteria are sought, and the processes by which those tools are applied. The

review of the literature has been done to identify the predictors for good and bad performance. Then the recommendation for the best tools for the admission criteria to predict the best future health practitioners who will perform well in the health colleges and beyond.

Current Admission Process I Saudi health colleges:

The current admissions criteria have been unified for the four health colleges (Medical, Dental, Pharmacy and Allied Medical Science) in some of the Saudi universities. The ratio of boys to girls vary from 1/1, 2/1 to only boys in different Saudi universities. The following four components or some of them are currently used:

1. The academic ability (all applicants should fulfill the high school passing grade ≥ 90%, is the first and mandatory condition) which account for 30% of the weight,
2. The "Aptitude Test" which tests the deeper understanding of the given reading materials and some mathematic problem- solving abilities in forms of MCQs which account for 30% of the weight. This part of the exam is conducted sixth monthly [(2)].
3. The "Achievement Test" based on the three years high school scientific subjects (chemistry, biology, physics, mathematics & English) which consist of MCQs and represents 40% of the weight. Usually, the decision about the student has been taken by the sum up of these three written examinations which are mainly based on the cognitive abilities of the candidate [(3)].
4. A well-structured interview that focuses on personal attributes and attitudes of an applicant by a panel of three interviewers for 20 minutes which may exclude about 10-15% of the candidates already taken for the interview from the first three items in the exam. This interview is resource-intensive and expensive.

The aptitude test and the achievement test are conducted centrally under the supervision of the Ministry of Higher Education. The interview part is conducted by each university where the candidate has applied. The interview and acceptance of a candidate is done individually by the corresponding university. It has been found about 15% of the candidates did not show up after getting the acceptance by a university [4].

Admissions tests used to select medical students in other countries:

In United Kingdom [5], though there is some commonality across medical colleges with regard to the criteria used to select future students: academic ability coupled with a "well rounded" personality demonstrated by motivation for medicine, extracurricular interests, and experience of team working and leadership skills. The processes used vary substantially. Some medical colleges do not interview; some shortlist for interview only on predicted academic performance while those that shortlist on a wider range of non-academic criteria use various techniques and tools to do so. Some medical colleges use information presented in the candidate's personal statement and referee's report while others ignore this because of concerns over bias.

In other European countries [6], there is even greater heterogeneity, for instance, in the Netherlands, medical schools may select a proportion of the candidates via interview and other methods, but the remaining candidates are identified through a lottery among school leavers weighted for academic attainment. The heterogeneity in the selection processes exists both between and within countries.

In the United States, requirements for admission to medical colleges vary from school to school and include minimum academic levels (indicated by undergraduate grade point averages; GPA), performance in the medical college admissions test (MCAT; a

standardized cognitive test which consist of four domains: 1.physical science 2.biological science 3.writing sample 4.verbal reasoning). Most of these colleges conduct well structured and validated interviews to identify one or more of a range of non-academic characteristics, these interviews may last up to ninety minutes in some of the universities. A similar approach to selection is seen among the 17 Canadian medical colleges [(1)].

In both the US and Canada, medicine and dentistry are taken as a postgraduate degrees. This is not the case in most of the world countries. In Australia, admission to medical schools could be in two ways, either as a postgraduate or directly from high school. The methods adopted in selection again comprise a combination of minimum academic attainment, cognitive testing, and interview [(7)].

The period at health school also represents a considerable personal investment of time and money for the student and the society. For both the good of the individual and of society then, it is important to minimize the rate of attrition by optimizing the student selection procedure and having robust mechanisms to early identify and support those who are "struggling" or poor performers, which has been found up to 15% in one of the studies [(8)].

There has been a growing acknowledgment for some years that non-academic personal qualities are just as important and influential to the learning and practice of medicine as academic ability [(9)]. Accordingly, an increasing number of medical colleges require applicants to complete tests that measure qualities, traits and abilities other than academic ability. The oral assessment was found to be reliable and valid tool. Structured interviews have been shown to provide important additional predictive information and higher internal consistency [(9)].

The University of Adelaide, Australia, conducted extensive examination of empirical evidence of the selection process of medical students and adopted a national written examination of reasoning and interaction skills, a structured oral assessment and a threshold matriculation score [10].

The most important purpose of the interview is to gather non-academic information about candidates that would be difficult or impossible to obtain by other means. An innovated protocol "The Mini-Interview" has been proposed and shown to be feasible, acceptable and reliable method to personal qualities of a candidate [11].

Predictors for good performance in the selection procedures: Several studies in the United States report extensive validation of their admission criteria. A study reports a comprehensive summary of the relationships between GPAs and MCAT scores and (1) medical school grades, (2) USMLE Step scores, and (3) academic distinction or difficulty [12]. The results show that the grades were best predicted by a combination of MCAT scores and GPAs, with MCAT scores providing a substantial increment over GPAs. MCAT scores were better predictors of USMLE Step scores than were GPAs.

A meta-analysis of the validity of the Pharmacy College Admission Test (PCAT) & GPA has shown that both the PCAT scores & GPA were moderate to strong predictors of grades earned in pharmacy programs & scores on Licensing Examinations [13].

Reliability and validity has been shown to be higher in structured medical admissions interviews as compared to unstructured and individual interviews [14, 15].

Psychometric tests have been used to measure personality characteristics and abilities rather than learned material. A test battery called the Personal Qualities Assessment (PQA) has been developed by researchers in Australia. The battery consists of 3 tests, of which

the first is designed to measure individual differences in cognitive reasoning ability, the second to identify an Involved (empathic and confident with others) or Detached (narcissistic and aloof) personality trait, and the third to determine ethical/moral orientation. Research by the authors of the PQA indicates the tests have acceptable reliability, and correlation studies with well validated and widely used personality tests and have provided evidence of the construct validity [16-18].

A selection instrument has been developed to assess the candidates' capability to work as part of a team in a problem-based learning (PBL) curriculum, where learning content is explored and mastered in student-centered teams. It was administered during the student selection process, and evaluated for its reliability, validity, fairness and acceptability among the candidates. The instrument found to have good item discrimination and high reliability and was acceptable by candidates. It appears to be well suited to assess candidates suitable for PBL curriculum [19].

Predictors for the poor performance:

In a study in the UK [1], 10-15% of each year's student intake were identified as strugglers or poor performers. Significant independent predictors of students being in this category were negative comments in the academic reference, lower mean examination grade at A level and the late offer of a place. Male sex was a less significant risk factor as was a lower grade at GCSE science. Age at entry to the course and the possession of a previous degree were not predictive.

Un-valid factors to detect the performance:

Personal statements and referees' reports are widely used on medical college application forms to assess motivation, interest and commitment to a medical career. The personal

statement and the referee's report cannot validly be used to identify doctors who will subsequently be dissatisfied with a medical career if the report is positive or in favor of the candidates [20]. But if the reports from headmaster are negative or do not favor the candidate, so it could be a predictor for a poor performance [8].

The only measure of academic performance used for selection of students admitted to the medical schools, is a very weak predictor of success in a medical school[21].

Conclusion:

ii. Saudi universities have come a long way since the days when secondary school results alone where considered good predictors of "success". It was realized that doctors need more than academic abilities. In the view of the international literatures, the tools and procedures for selecting candidates for admission in the health colleges in the country appear sound [22], but they lack the published evidence of validity and reliability and

References of the admission

1. Albanese MA, Snow MH, Skochelack SE, Huggett KN, Farrell PM. Assessing personnel qualities in medical school admissions. *Acad Med* 2003; 78: 313-21.
2. The Aptitude Test: http://www.qiyas.org/exam/abilities_exam.htm.
3. The Achievement Test: http://eservices.ksu.edu.sa/dar/shownews.jsp?id=80
4. Personal Communication (unpublished data).

5. Parry J, Mathers J, Stevens A, Parsons A, Lilford R, Spurgeon P, Thomas H. Admissions processes for five year medical courses at English schools: review. BMJ 2006; 332:1005-1009
6. Coebergh J. Dutch medical schools abandon selection for lottery systems for places. *Student BMJ* 2003;11: 138.
7. Admission to Australian Medical Schools. www.medical-colleges.net/medical.htm.
8. Yates J**,** James D**.** Predicting the "strugglers": a case-control study of students at Nottingham University Medical School. BMJ 2006;332:1009-1013
9. Searle J, McHarg J. Selection for medical school: just pick the right students and the rest is easy! Me Edu2003;37:458–463.
10. Turnbull D, Buckley P, Robinson JS, Mather G, Leahy C, Marley J. Increasing the evidence base for selection for undergraduate medicine: four case studies investigating process and interim outcomes. Med Edu 2003: 37 (12): 1115-20.
11. Eva KW, Reiter HI, Rosenfeld J, Norman GR. The Ability of the Multiple Mini-Interview to Predict Preclerkship Performance in Medical School. Ac Med 2004; 79 (10): S40-S42.
12. Julian ER. Validity of the Medical College Admission Test for Predicting Medical School Performance. Acad Med 2005; 80(10):910-917
13. Kuncel NR, Crede M, Thomas L L, Klieger DM, Seiler SN, Woo SE. A Meta-Analysis of the validity of the PCAT and Grade Predictors of Pharmacy Student Performance. A J Pharm Edu 2005; 69 (3): 339-47
14. Courneya A, Wright K, Frinton V, Mak E, Schulzer M, Pachev G. Medical student selection: choice of a semi-structured panel interview or an unstructured one-on-one interview. Med Teach. 2005 Sep; 27 (6):499-503.

15. Powis DA, Neame RLB, Bristow T, Murphy LB. The objective structured interview for medical student selection. *Med Educ* 1988; 296: 765–8.
16. Bore M, Munro D, Kerridge I, Powis D. Not moral 'reasoning': a libertarian−communitarian dimension of moral orientation and Schwartz's value types. *Aust J Psychol* 2005, in press.
17. Munro D, Bore M, Powis D. Personality factors in professional ethical behaviour: studies of empathy and narcissism. *Aust J Psychol* 2005,
18. Personal Qualities Assessment (PQA). http://www.pqa.net.au
19. Chamberlain SE & Searle J. Assessing suitability for a problem-based learning curriculum: evaluating a new student selection instrument. Med Edu 2005; 39: 250
20. McManus IC, Iqbal S, Chandrarajan A, Ferguson E, Leaviss J. Unhappiness and dissatisfaction in doctors cannot be predicted by selectors from medical school application forms: A prospective, longitudinal study. BMC Med Educ. 2005; 5: 38.
21. de Silva NR, Pathmeswaran A, de Silva HJ. Selection of students for admission to a medical school in Sri Lanka. Ceylon Med J. 2004 Sep;49(3):81-5
22. Admission Requirements of Canadian Faculties of Medicine www.afmc.ca/docs/2005AdBk.pdf
23. Abdullah M. Al-Faisal (Rector of King Saud University). How the university dealt with the problem of admission. 1424 H.

Conclusions and Recommendations

For new health schools and for schools following a traditional, teacher-based curricula and are contemplating curricular reforms, these are our suggestions:

1. Educational Environment:

There are significant problems in the educational environment of health colleges especially in the College of Medicine and the College of Dentistry. These problems are increasingly abundant in the teachers' domain. Therefore, we recommend designing and implementing a faculty skills development program that concentrates on modern teaching methods which encourage students and promote safe, motivating and cooperative educational atmosphere.

2. Students' support system and Mentorship

The health schools decision makers should be convinced about the importance of student support system. It must be appreciated from the start that this encompasses a lot of work and needs plenty of financial and human resources.

A. The first step is to develop an appropriate mentoring (academic advisory) system. This project in itself needs a lot of work, efforts and preparation. Teaching staff who will be selected to be mentors for groups of students should be given some incentives either in the form of reducing their duties or through some financial

incentives. A manual of the policy and guidelines for this mentoring system should be developed and established. The sharing of the resources with other universities should be considered. Sufficient training and preparation should be conducted for the selected mentors and counselors. Another point is a monitoring system that can track students whose performance decline and to look for the causes carefully in order to help accordingly.

B. .Orientation for the new students and for students new to any course. The Student Handbook should address the complementary issues of institutional responsibilities and learner entitlements, reasonable expectations and responsibilities'. These aims include: 1. enable students to gain greater control over their learning experience and learning environment, 2. facilitating informed decision-making, and ensuring that the learner-teacher relationship is embedded in an explicit framework of rights, responsibilities and expectations. A manual should be designed and distributed to the new students in the medical school. This manual should explain the students' rights, the facilities and services available in the university and the medical school and their responsibilities.

C. During the courses, study guides should be developed and each course should have clear objectives and outline and in depth or detailed explanation of their assessment method.

D. Some supporting offices should be opened. The academic (student well being) center is very important. It aims to (1) empower and help students to find solutions for academic and social problems and (2) help students to develop their learning (study) skills. The legal advice office is needed too.

E. The Financial aid center should be used to provide loans to students who have financial difficulties.

F. The students' housing should be developed as possible to make it more convenient, comfortable transport means from the housing to the college is also needed.

G. The library should be opened for longer hours, particularly during the week-ends and in the evenings, and should expand the internet access to the students and increase the subscription to the electronic data-bases. The access to the electronic mail is useful not only for academic reasons but also as mean to contact family and friends to counter the feelings of loneliness and lone sickness should be included.

H. A sport center and cafeteria attached to the health colleges should be made available so that the students can practice some sports and spend free time in leisure activities during the working hours.

I. Cheating should be prohibited as possible through better seating arrangements, warning and punishment to students who attempt such activities. The previous exam papers which are available in the commercial student services centers should be collected and the course organizers should be requested not to use those questions.

J. The restaurants for males and females should be made more convenient.

K. Child care and nursery services should be provided for the female students who have children.

L. Student contact scheme: The Student Contact Scheme was built on the simple premise that for new students one of the best sources of information and help is other students. It aims to help build links between students who are studying at Levels One and Two of the same program. Through regular meetings, it is intended that students will be able to share their experiences and act as a source of information and support for each other.

M. Orientation to the high school students who are willing to join the college. Since, many of the students enter the health field just because they have outstanding grades; it is probably useful to give them chance to discuss relevant information on the health field.

N. Support to the new staff members in the form of:

- Introductory Information: This may be routine information about how the department operates, about the course or about the curriculum, e.g. details about educational strategies, teaching and learning methods, assessment and educational resources available.
- A Guide to the Staff: There may be a need for an in-depth description of various academic and departmental staff. This could embrace the technical, research and administrative personnel.
- Faculty Information: This may encompass knowledge about contract staff and part-time workers.

Research: Research projects and resources may need to be described in some detail.

3. Patients' Perception of Health Practitioners:

When study patients were asked about the most important characteristics that they would like to see in the health practitioner, it was found that most desired characteristics are focused around communication skills. Patients would like to see health practitioner smiling, compassionate, sympathizing with them, respective to patients and not hasty. Therefore, there is a great need to include communication skills as an integral part of the curriculum.

4. Essential Common Recommendations for Required Competencies in Health related Colleges Graduates:

Knowledge:

- The scientific facts should be limited.
- The central part of the curriculum (core curriculum) should include the basics of knowledge and skills and the required directions.
- A part of the curriculum should be elective (about one quarter of the curriculum), i.e. elected by the student himself.

Major Skills:

- First aid and cardiopulmonary resuscitation skills.
- Evidence-based medicine skills.
- Communication skills with patients, their relatives and colleagues. These also include referral and dealing with medical records.
- Self-learning and life-long learning skills.
- Other basic skills such as computer skills and problem solving skills.

Behavioral (Attitudinal) Objectives:

Attitudes and behaviors that suit future responsibilities of students (as health workers) towards patients, colleagues and society should be developed.

1. Awareness of the importance of the following general issues:
   - Reflection on practice, be self-critical and carry out an audit of his work and that of others.

- The student should recognize his personal and professional limits. He must also realize that consulting with collaegues and asking for help are important for the sake of patient and the learner alike.
- Accepting constructive criticism and feedback.
- Considering medical ethics when taking any decision.

2. Awareness of the importance of work environment: The graduate must be aware of the rules, regulations and economic framework related to work environment as well as the national health care and its regulations which include:

- The care is patient centered.
- Quality assurance and scrutiny (inspection) systems.
- The importance of health and safety issues in health care, and fighting infections.
- Risk assessment strategies and management.
- The importance of team work for various health professions.

3. Awareness of ethical and legal issues related to:

- Protection of patient's rights and considering his or her own welfare over any other consideration such as keeping his secrets.
- Provision of appropriate health care to patients with special needs (mental or physical disabilities).
- Dealing with issues of providing or withholding treatment (as in terminal cases).
- Responding to patients' complaints and answering their questions.
- Providing information that enables the patient to take his own decisions and consequently taking approval.

4. Awareness of the importance of issues related to health: The graduate should be aware of the issues and techniques involved in studying the effect of diseases on individuals and communities, including:
    - Assessing community needs in relation to how services are provided.
    - Genetic, environmental and social causes of, and influences on the prevention of, illness and disease.
    - The principles of promoting health and preventing disease, including surveillance and screening.
    - Understanding the cultural and social environment in which medicine is practiced, and reproductive health and growth.
    - Understanding social and cultural values, and differing views about healthcare and illness.
    - Taking account of patient's understanding and experience of his condition and its effect on him and his family, and exploring patients' fears and concerns.

To achieve these important common educational outcomes, one must consider the following:

- The core curriculum should be decided by the teachers who are clinicians, basic scientists and medical educationalists. The role and the needs of the students must also be considered.
- Teaching and learning systems must take account of "modern educational theory" and research, and make use of modern technologies where evidence shows that these are effective. Schemes of assessment must take account of best practice, support the curriculum, make sure that the intended curricular outcomes are assessed and reward performance appropriately.

- There must be effective supervisory structures which use an appropriate range of expertise and knowledge.
- Selection, teaching and assessment must be free from unfair discrimination.

5. Ten questions to be answered when planning any curriculum:

When planning and designing the curriculum or course materials for a health college, it is imperative to answer the following questions. This will facilitate and clarify the plan and guarantees the harmonization between vision and application. As an example, the SPICES model (strategy) will facilitate the assessment of the current curriculum and the harmonization between this curriculum and the college objectives and mission. Also this model may constitute a solution to discuss the planning of the curriculum and the assessment system.

The questions are:

1- What are the needs in relation to the product of the training program?

2- What are the aims and objectives?

3- What content should be included?

4- How should the content be organized?

5- What educational strategies should be adopted?

6- What teaching methods should be used?

7- How should assessment be carried out?

8- How should details of the curriculum be communicated?

9- What educational environment or climate should be fostered?

10- How should the process be managed?

6. Which is better PBL or Hybrid curriculum??

Compared with conventional instruction, PBL(as suggested by the findings of Albanese and Mitchell) is more nurturing and enjoyable; PBL graduates perform as well, and sometimes better, on clinical examination and faculty evaluations. Further, faculty tends to enjoy teaching using PBL. However, PBL students in a few instances scored lower on basic sciences examinations and viewed themselves as less well prepared in the basic sciences than were their conventionally trained counterparts. PBL graduates tended to engage in backward reasoning rather than the forward reasoning experts engage in, and there appeared to be gaps in their cognitive knowledge base that could affect practice outcomes. The costs of PBL may slow its implementation in schools with class sizes larger than 100. While weaknesses in the criteria used to assess the outcomes of PBL and general weaknesses in study design limit the confidence one can give to conclusions drawn from the literature, the authors recommend that caution be exercised in making comprehensive, curriculum-wide conversions to PBL until more is learned about, i. the extent to which faculty should direct students throughput medical training, ii. PBL methods that are less costly, iii. cognitive-processing weaknesses shown by PBL students, and, iv. the apparent high resource utilization by PBL graduates.

7. Proposal of a quality assurance scheme that could be adopted in a health school that adopt a traditional curriculum.

In our proposal for QA approach; we are suggesting to divide the college curriculum into four phases rather than into the departments courses in order to reduce the departments' boundaries.

Quality Assurance(QA),Organizational Structure and Operational Framework.

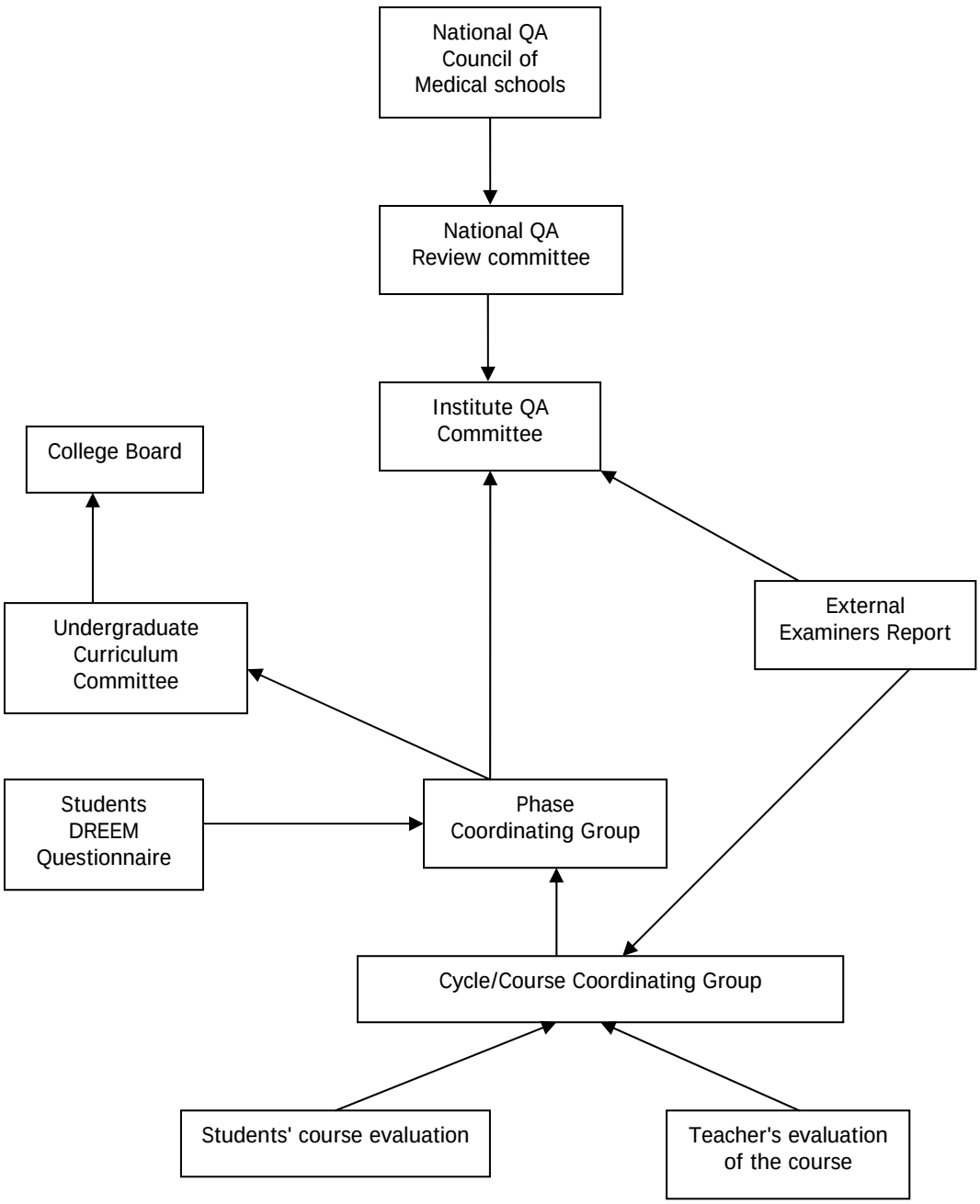


Figure 1: Quality Assurance Organizational Structure and Operational Framework.

Phase-I

First two years in the form of basic sciences.

Phase-II

Third year: Community Medicine – Pharmacology – Forensic Medicine introduction to Medicine and Surgery.

Phase-III

Fourth and fifth years: six clinical rotations, three months each.

Phase-IV

The internship (house officers) years.

Course coordinating groups:

Each phase consists of many courses/cycles that have coordinating groups. One of the teaching staff will act as a coordinator for that group and the members include 3 students plus 2 teaching staff.

The tasks of the course coordinating groups include:

1. Collecting feedback from students, course teachers and external examiners.
2. Analyzing the data and write report including recommendations to teachers involved in the course or to the phase coordinating group.

The phase coordinating group consists of:

- Coordinators of all courses taught in that phase.
- Two teachers involved in the teaching of the phase courses.
- Two students.
- One Statistician or Epidemiologist.

- One member from Medical Education Center.
- One secretary.

Tasks:

1. Collect data from the courses coordinating groups and students questionnaires assessing the education environment like DREEM.
2. Analyze the questionnaire and phase and its qualitative data.
3. Write a report evaluating the phase and its courses with recommendations for improvement and submitting the report to the institute QA committee and the undergraduate curriculum committee.

The institute QA committee:

It consists of the following:

- The Dean of the Medical School
- The Vice Dean for Academic Affairs
- The Director or a member of medical education center
- The coordinator of all the four phases
- 1 member from each phase
- 3 Students
- 2 Interns
- 1 Statistician
- Chairman (or a member) of the Faculty Development Program

The institute QA committee is ultimately responsible for quality control within the college. In effect, that committee ensures that the information available from the phases coordinating groups, student evaluation forms, phase coordinators and the external

examiners was collated, carefully considered and when appropriate used to improve the educational experience for students. It is hoped that this form of feedback loop will provide a powerful force for improving the undergraduate learning experience.

External examiners:

The external examiners will provide feedbacks to both the course coordinating groups and the institute QA committee (Figure 1). It is suggested that each course/cycle should have an external examiner at least once each three years. Their feedback may focus on the following:-

- Course objectives.
- Course curriculum.
- Study guidance.
- Assessment.
- Students' level.
- Student discussion.

The national QA council of medical schools consists of the following members:

- 1 member, a teaching staff from each university.
- 1 member from the ministry of health
- 1 member from the national guard
- 1 member from the private health sector
- 2 members from the Saudi Council For Health Specialties
- 1 member, an external advisor from a national academic body.

All members should be having experience or qualification in medical education or quality assurance.

The role of the national QA council of medical schools is to:

1. Set the academic standards to be met by all the medical schools in the Kingdom of Saudi Arabia. The criteria could be divided into essential and elective.
2. Form the national QA committee.
3. Decide the budget to be provided to the medical schools and the bonus based on the results of their national QA committee evaluation (higher bonus for excellent performance).
4. Publicize their results to the public.

The national QA review committee consists of the following members:

- 2 members from ministry of higher education.
- 1 member from ministry of health.
- 1 member from Shora Council.
- 2 members from the Saudi Council For Health Specialties.
- 2 lay assessors.

Other than the lay assessors, all the other members should be having qualification or experience in the field of QA or medical education.

The committee may assess quality under the following headings:-

- Curriculum design, content and organization.
- Teaching, learning and assessment.

- Student progress and achievement.
- Student support and guidance.
- Learning resources.
- Quality Assurance and enhancement.

8. Electronic Education:

The electronic education became a necessity to comply with the continuous changes taking place in the study of health sciences.

9. Skills Laboratory:

Twelve tips for setting up a clinical skills training facility:

1. Consider the educational, management and financial advantages of extending access to clinical skills learning facilities to students from a broad spectrum of health-care backgrounds and at different phases of their educational development.
2. Reflect on the desired educational outcomes to which learning at the clinical skills centre can contribute. This can be viewed more widely than the acquisition of communication and physical examination skills and competence in practical procedures.
3. Plan to have a mix of staff with a small core exclusively devoted to the centre and others with teaching responsibilities shared between the centre and other clinical settings. The management team needs to be carefully chosen, multi-skilled, flexible, understanding and committed to the corporate goals.
4. Ensure that the clinical skills' setting is optimally attractive to users, designed to meet their perceived needs and utilized effectively.

5. Equipment should be chosen with the needs of the users in mind, maintained in good order and replaced as required. The range and number of these items should be adequate. Do recognize, however, the limitations of simulators, particularly simple ones such as those for vaginal and rectal examination, and their variable effectiveness in demonstrating abnormal pathologies. Although expensive, sophisticated and interactive high-level simulators may be more cost-effective.
6. Simulated patients play an essential role in the clinical skills facility. You may able to recruit them relatively easily by local advertising. Assign a member of staff to be responsible for recruiting, coordinating the training and maintaining the commitment of the simulated patients. Study the different approaches that have been used in training and select the one that best suits your own situation.
7. Develop and maintain a bank of real patients with clinical features. They represent a valuable asset for both teaching and examination purposes.
8. Patients can be useful to students in a number of different ways. Consider how patients can contribute to teaching in the clinical skills facility. There are advantages in involving the community in the development of the next generation of health care professionals.
9. Consider how the clinical skills facility can fit in with the educational strategies of the curriculum as a whole. The SPICES model[15] provides a useful tool for analysis. Consider the learning strategies to be adopted within the clinical skills centre itself.
10. Consider how the clinical skills facility can contribute to the process of individual student assessment and assist, where necessary, in remediation. Evaluation of the clinical skills learning program should be an integral part of the overall educational strategy.

11. Research and development should be an integral part of any clinical skills learning initiative. Scientific evaluation of existing programs should go hand in hand with exploration of new, exciting, effective and relevant methodologies.
12. The clinical skills facility should be an integral part of the institution's overall educational structure and process while remaining sensitive to the perceived needs of individual groups of users.

10. Guiding Principles for Better Education:

A. More emphasis on small group teaching and clinical teaching e.g. ambulatory teaching is needed.
B. Lectures should only give concepts, not the details in order to motivate self-learning and interaction.
C. More emphasis on computer-aided learning (CAL) and simulators in clinical skill laboratories. The libraries should be equipped with the recent periodicals, video, cassettes, CDs, and subscribe to online journals.
D. Emphasis on deep processing and critical thinking is the heart of life-long learning and is a pre-requisite for the Continuing Professional Development.
E. More emphasis on learners' activity, relevance through real patients' examples as stimuli for learning. The use of feedback should be encouraged.

Seven principles to guide teaching practice.

1. The learner should be an active contributor to the educational process.
2. Learning should closely relate to understanding and solving real life problems.

3. Learners' current knowledge and experience are critical in new learning situations and need to be taken into account.
4. Learners should be given the opportunity and support to use self direction in their learning.
5. Learners should be given opportunities and support for practice, accompanied by self assessment and constructive feedback from teachers and peers.
6. Learners should be given opportunities to reflect on their practice; this involves analyzing and assessing their own performance and developing new perspectives and options.
7. Use of role models by medical educators has a major impact on learners. As people often teach the way they were taught, medical educators should model these educational principles with their students and junior doctors. This will help the next generation of teachers and learners to become more effective and should lead to better care for patients.

11. Feedback for teachers:

The assessment of the teaching session, whether it is didactic or clinical could be any of the following:-

- ❖ Invite one of the colleagues to attend and assess teaching skills (peer assessment).
- ❖ Videotape teaching sessions and see it alone or with one of your colleagues or students. This can be a particularly informative technique for evaluating the teaching performance.

12. Best Evidence Medical Education:

The adoption of a BEME approach should encourage teachers and/or teaching planners when contemplating a new educational intervention to:

- comprehensively critically appraise the literature that already exists in an area, and categorize the power of the evidence available, and
- identify the gaps and flaws in the existing literature and suggest (and if possible carry out) appropriately planned studies to optimize the evidence necessary to make the proposed educational intervention truly evidence based.

13. Clinical teaching:

Feature of an effective clinical teacher include group instructional skills, attitudes to patients, applied problem solving, student-centered instructional strategies, humanistic orientation, the subject expertise and a challenging approach.

Modern trends in clinical teaching:

- Move from student centered to patient centered approach
- Move from apprenticeship to Systematic approach
- Multi professional aspects
- Focus on the clinical setting
- Reflective practice.
- Early introduction to clinical practice.

14. Principles and tools of assessment

- The assessment methodology should be conspicuous from the beginning of the courses. It should encourage deeper approach to learning. The students should be encouraged to use self assessment and peers assessment as life long learning skills.
- The OSCE exam should be introduced to all the long clinical rotations or if it is not possible it should be at the end of each year. The option of OSCE exam at the end of the program is another possibility.

  Multiple choice questions should shift towards the single best answer stimulus rich (with scenarios) MCQ types as they encourage higher cognitive levels of thinking.

15. Admission System:

These are some suggestions for improvement in the admission process:

A. The current admission policies of some Saudi universities allocate equal or less seats for female students compared with their male counterpart. The female patients consult more frequently and they are disadvantaged when seen by male doctors.

   As the Saudi conservative community needs more female doctors, we therefore recommend allocating more seats to female students than male students.

B. To continue the four components of the selection of the candidates for admission for the health colleges.

C. To improve the interview by increasing the time and exposure and making it more structured and weighted. It is important to select competent interviewers and increasing their ability by the training; rehearsal and workshops. The "mini-interview" or a similar tool like the "personal qualities assessment" could be

utilized for this purpose. A cost-benefit analysis for the interview is strongly needed [11, 18].

D. It is important to see how well these criteria and tools will perform their functions. We need published data to report inter-correlation coefficients between these criteria to show the reliability. Also to relate these to the outcomes like grades of success or attrition rates from these colleges. A nationwide collaboration could provide opportunities for research to establish more efficient and effective ways of selecting tomorrow's doctors.

E. There is about 15% did not show after getting the confirmed admission from the universities, so centralizing the admission procedures all over the Kingdom could be a solution for this problem.

F. For medical schools that adopt or intend to adopt a PBL curriculum, we recommend assessing candidate's suitability for this type of curriculum and for small group learning.

16. <u>The process of curricular change:</u>

- The leader (dean) influences others working in the school. He or she articulate and advocate the organization vision. He should be on the front. ‘’Chairing the curriculum reform committee is both worthwhile and important’’. This gives a clear message that the curriculum and the academic activities are a priority in the school. It is the leader who traverses the political terrain; others work on the curricular change.
- The dean should form a committee from various disciplines and those who are exposed to current trends of medical education. The committee would identify

the core contents of the curriculum. This committee, not the departments, should be given the authority in deciding the contents.

For more details on the process of change in the curriculum, the reader is advised to look at the following two articles:

1. Curricular Changes in Medical schools: How to Succeed. Carole J.Bland et.al. Academic Medicine 2000,75(6):575-594.
2. Oral Health Care in the 21st Century: Implications for Dental and Medical Education. Hendricson W.D. Academic Medicine 2001,76(12):1181-1206

17. Curricular reforms:

The curriculum reform: The college curriculum should be reformed in a way that facilitates discussion and to convert the instruction method from being lecture based into more participatory exercises. Furthermore, the curriculum should be student-centered. The teaching staff should be encouraged to make the learning environment secure and comfortable to the students. They should be encouraged and trained to provide feedback to students frequently both in the class rooms and clinical training. . The staff should reduce the detailed factual knowledge and keep only the core knowledge and focus on higher intellectual and problem solving exercises. Topics discussed should be those likely to be met in real life. Students should be given more freedom to select the method of learning e.g. using the internet, attending lectures, or attending clinics, labs, watching videos, discussing with colleagues, reading at home or in the library. For all these changes to take place, the support of the faculty development program is needed.

- For a medical, dental, nursing, pharmacy or applied medical sciences' schools to answer the 10 questions discussed earlier.
- The students should have a say in the curriculum content according to their learning needs.
- One third to one fourth of the curriculum should be as electives.

- It is advisable to reduce the class contact hours and leave some time in the schedule for the students' self-directed learning, self study and reflection.
- At the early years of the school, some emphasis needs to be put on generic skills like:

    - Evidence based medicine course to help develop critical thinking skills.
    - Searching skills course to help develop self directed and life long learning skills.
    - Information technology and how to use the library
    - Communication skills.
    - A study skills course for students in which a deep approach to learning is fostered.

18. <u>Faculty training:</u>

- The Faculty development program should organize workshops that prepare the staff to improve their teaching and assessment methods. There is a need to use assessment tools that enhance deep learning and higher cognitive thinking such as OSCEs and problem solving MCQs.

- Faculty developments program should organize workshops that aim to prepare the staff to improve their teaching and instructional skills. The facilitation skills in small groups teaching are needed. The principles of learning theories and their application are important; for example the motivation of the learners through stimuli, relevance of the material presented and individualization. Feedback, activity of the learners, schema activation and interaction are other examples of the learning theories principles. Teachers should enhance deep learning and encourage the use of meta-cognitive skills among their students. All the above can come only at the cost of reducing the amount of traditional content covered.
- The teachers should make sure that the students feel secure to participate in the learning process.