

***EDITORIAL***

**Curriculum Development of the Faculties of the Health and  
Agricultural Sectors University of Gezira  
15.12.2011 to 15.6.2012**

Omer Ahmed Mirghani, Mohamed El Sanousi Mohamed, Osman Mohamed Elamin Magbool, Mohamed Ahmed Ali Omer, Dia Eldin ElGaili AbuBakr, Abdulla ElFaki Abbas, Imad Mohamed Tag ElDin, Yousif Fadl Alla Mohamed, Ahmed Abdulla Mohamadani, Hashim ElTom, Omer Hassan Arabi.

*The Deans of Faculties:* Haydar Osman Abdulla, Ali Babiker Habour, Yasir Mohamed ElHassan, Magahid Abdul Rahman Yousif, Bakri Mohamed Yousif, Ibrahim ElHag Mahdi, El Sir Abd Elhay Babikr ,Ganim Elzain Salih, El Hadi Mohamed Ahmed.

*Correspondence:* Prof.Omer Ahmed Mirghani. E-MAIL: [editor-gjhs@yahoo.com](mailto:editor-gjhs@yahoo.com)

**1. Introduction:**

The University of Gezira adopts noble goals, community orientation and community development- and it set curricula capable of achieving those goals which are essential for sustainability of its excellence. Periodic development, upgrading and modernization of curricula is a fundamental requirement for all universities; knowledge is growing and changing very fast, also there are rapid changes in community needs and expectations and hence graduates should be equipped with competencies which enable them to contribute significantly and efficiently in the total development of their societies. The University has a wealth of experience in development of its curricula since its foundation and hence it included it as one of the main four components of the University Development Project. The project is sponsored by the Islamic Bank for Development-Jeddah and the Ministry of Finance Sudan and has been launched in December 2011. The Project aimed to develop the Faculties of agricultural and health sectors- curricula, manpower and infrastructure. Those sectors were chosen to be sectors of excellence for students in the Islamic countries. The Vice Chancellor of the University of Gezira formed a committee to manage the whole task of development of all the curricula of the faculties in the health and agricultural sectors; Medicine, Medical Laboratory Sciences, Animal Production, Veterinary Medicine, Applied Medical Sciences, Dentistry, Pharmacy, Health and Environmental Sciences, Agricultural Sciences. The committee set the justifications, determined its strategies and designed the process of its work. The whole task was accomplished in the stipulated time - 4 months.

This article describes how the task was managed and how the curricula were developed: objectives, strategies, methodology and process. It also includes the major development in each curriculum.

**Phase I. 14.12.2011 to 26.1.2012**

This phase included the followings: setting a detailed action plan, formation of curriculum committees in each faculty, provision of relevant references, nomination of experts, writing clear and detailed guidelines for the faculties' committees and organizing a five days training course on curriculum development.

**Phase II. 29.1.2012 to 26.2.2012**

This phase included: reviewing the existing curriculum of each faculty, determine the reference curricula and the society needs, and based on the results of that review the characteristics of the graduate were identified and consequently the deficiencies in the existing curriculum required to bridge the gaps and

## ***EDITORIAL***

achieve the characteristics of the graduate were determined. This phase also included the first workshop which approved the characteristics of the graduate, the tentative degree structure, and the degree awarded.

### **Phase III. 1.3.2012 to 9.5.12**

During this phase the degree structure (curriculum plate) of each developed curriculum was designed (semesters, courses, contact hours, credit hours). All the courses were written in details according to a uniform format. Finally each faculty organized its workshop which approved the developed curriculum. The final report-including all the developed 8 curricula and the details of all the events of the whole task-was prepared by the committee and submitted to the vice chancellor on 15/6/2012.

## **2. Strategies:**

The committee (the university committee) adopted the following strategies to achieve its goals:

- Setting a detailed action plan including all activities (4 months).
- Early involvement of the deans of faculties and throughout the task; planning, implementation and monitoring.
- Formation of faculties committees.
- Depending primarily on all the academic staff members of the faculties and effectively utilizing their experiences in curriculum development and management.
- Designing a clear, detailed and explicit methodology for curriculum development and adopting a practical and relevant model.
- Developing guidelines to help the faculties committees understand and apply the methodology
- Close supervision, follow-up and support of the faculties committees work through regular meetings and site visits
- Training of academic staff members on curriculum development.
- Conforming to the model curricula of the Ministry of Higher Education and Scientific Research-Sudan.
- Reviewing the existing curriculum and similar relevant curricula; national, regional and international.
- Consulting local and international experts and co-opting them to contribute meaningfully
- Involvement of stakeholders; students, graduates, community leaders and relevant employers and professional councils.
- Continuous liaison with the University administration and responding to its suggestions.
- Uninterrupted continuous work of all the committees for 120 day.

## **3. Methodology:**

The committee developed a detailed methodology of curriculum development and planned a strict schedule for its implementation. The committee also developed 3 sets of guidelines- a set for each phase- to help the faculties committees implement the methodology. The committee adopted the outcome- based approach model described below.

- 3.1. **Assessment of needs** (society, learner, subject matter). Information about these needs are obtained from different sources; the national strategic plan, the University of Gezira strategic plan, professional and scientific organizations and societies, subject matter

## **EDITORIAL**

specialists, University teachers, literature review, professional regulatory bodies, employers, students, graduates, community leaders, national and international experts.

- 3.2. **Review of the Model Faculty Curriculum** Ministry of Higher Education and Scientific Research – Sudan (MHED) of each Specialty and other national and international relevant curricula.

These curricula are critically reviewed and compared to the existing curricula

- 3.3. **Formulation of the educational goals** of the faculty and the degree awarded by it. Based on the assessed needs and review of curricula the rationale and educational goals of the curriculum are set. Consequently the degree awarded upon completion of the curriculum is determined- general, honors, specializations.

- 3.4. **Characteristics of the graduate** (professionalism, cognitive skills, professional skills).

These characteristics are developed in details and are based on the results of needs assessment-society and subject matter. Guided by the characteristics of the graduate (what he will be expected to do) all the curriculum development process should be steered towards achieving those characteristics (what he needs to learn).

- 3.5. **The developed curriculum.**

The relevant curricula, the society and subject matter needs and the characteristics of the graduate are thoroughly analyzed and compared with the existing curriculum and consequently the deficiencies in the existing curriculum are identified and included in the developed curriculum (courses-contents-strategies).

- 3.6. **Preparation of the developed curriculum**

- The degree awarded by the faculty (general, honors, specializations) and the required courses which include all the contents of the developed curriculum (existing courses, amended courses, new courses) are determined.
- The courses required by the University, the faculty and the specializations are determined
- Block courses are preferred to longitudinal courses
- Each curriculum starts with an introduction course exposing the student briefly to the nature of subject of the curriculum, main objectives, methods of teaching and evaluation and the university academic regulations.
- Finally the courses are arranged in a plate in a rigid sequence considering the pre-requisites of each course. The plate includes the titles of the courses, their codes, contact hours and credit hours (theory-practical).

- 3.7. **Course format**

Each course is prepared in a course booklet including; title, code, contact hours, credit hours, semester, pre-requisites, justifications, objectives, instructional methods and methods of evaluation and their weights, resources, references and a DETAILED TIME TABLE.

The detailed contents of the developed course enable the graduate to acquire the desired characteristics, they reflect the fundamental reform in the curriculum and hence authors of the course are expected to make tremendous efforts in selecting those contents. Since the curricula of all targeted faculties are competency based the contents are stated in specific objectives using appropriate action verb e.g. perform, demonstrate.

- 3.8. **Educational strategies**

## **EDITORIAL**

A number of educational strategies has been adopted by the University since its foundation; community orientation, community based education, integration of sciences, student centered learning, problem based learning, team work, staff development, interprofessional training, social accountability and total quality management. These strategies are reviewed and adopted throughout the stages of curriculum development.

### **4. Process: steps in development of the curricula**

#### **4.1. Step 1: Early involvement of the deans of faculties.**

In its first meeting the committee reviewed the task and identified its objectives. Then it designed a detailed 4 months action plan. Shortly after that the committee met with the deans and they agreed on the followings: the action plan, the formation of curriculum committees at the level of the faculties and departments, provision of copies of the existing curricula and the model curricula of the Ministry of Higher Education and Scientific Research and other national and international relevant curricula and nomination of national and international experts. The committee and deans managed to accomplish all the above mentioned tasks in 4 weeks.

#### **4.2. Step 2: Training course on curriculum Development 22-26.1.2012**

The course (5 days) was designed, implemented and evaluated by the committee. It aimed to train the faculties' teachers in developing a new curriculum matching with the international accredited standards and understanding the concept of total quality management. Fifty four teachers were trained and 8 experienced professors participated in the teaching.

#### **4.3. Step 3: Faculty committee work 1.2.2012-26.2.2012**

The thrust of work fell on this committee. All the faculty teachers, the local expert (s) and a representative of the

University committee participated in the work. Guidelines were set by the University committee to help the participants achieve the objectives of this phase: determining the degree awarded, setting the educational goals of the Faculty and the characteristics of the graduate, identifying the deficiencies in the existing curriculum (contents and courses) and suggestions to rectify them in order to attain the characteristics of the graduate, designing a tentative degree structure (curriculum plate). The guidelines were mentioned in the methodology.

The faculties' committees worked continuously for four weeks and all issues were exhaustively discussed by ALL teachers. The University committee visited all the faculties and participated in the work; clarifying the methodology and giving technical advice. The products of the work was edited and prepared for presentation in the first workshop. Prior to the workshop all the presentations were revised extensively in a joint meeting between the University committee and faculties' committees.

#### **4.4. Step 4: First workshop 26.2.2012 (168 participants)**

## **EDITORIAL**

The purpose of the workshop was to discuss the outcomes of the faculties' committees work, make accepted amendments and approve them. A uniform format was used by all faculties; historical background, previous reviews, degree awarded (current and proposed), educational goals of the faculty and characteristics of the graduate, deficiencies identified, proposed degree structure (curriculum plate), references and experts.

All the faculties' teachers and a number of experts participated remarkably in the workshop. Significant changes (courses, contents, strategies) were introduced in all curricula presented and were convincingly justified. The degree awarded by some faculties (Animal Production,

Health and Environmental sciences, Medical Laboratory Sciences) was radically changed from general to early specializations. The pharmacy curriculum was modified to be clinically oriented. Followings are some of the workshop recommendations

- Designing a detailed timetable for each course
- Starting the curriculum with an introduction course
- Involvement of stakeholders in curriculum development
- Intensifying the practical component in all courses
- Early exposure to clinical sciences in the faculties of the health sector.
- Approval of the proposed curricula

### **4.5. Step 5: Writing the courses** and preparing the developed curricula 26.2.2012-11.4.2012

Guided by the recommendations of the first workshop the, authors of the courses wrote them in the approved format and finally the faculties committees developed the curriculum. The inputs of the University committee and the experts were of immense benefit to the authors.

### **4.6. Step 6: Final workshops** 11.4.2012-22.4.2012

Each Faculty organized its own workshop. All workshops were organized in a uniform format; presentation of the developed curriculum, small groups work and approval of the final version including all the amendments. All the faculties' teachers, local and international experts and stakeholders participated in the workshops.

A series of successful workshops which created a unique educational atmosphere conducive to innovation and strengthening the University excellence

### **Step 7: Final report**

The report includes all the details of the committee's activities and all the developed curricula. It was presented to the vice chancellor at a formal meeting on 15/6/2012.

## **5. Task management**

The whole task was under the patronage of the VC who formed the committee and facilitated its activities at all stages. The task was managed jointly by the committee, the deans, the faculties'

## **EDITORIAL**

committees and the University of Gezira Development Project Unit. The committee designed the action plan and methodology, developed the guidelines, organized a training course, provided technical support to the faculties' committees and organized the workshops. The committee visited each faculty three times, met with the teachers and participated in their work. The deans coordinated the work at the level of their faculties. The development project unit sponsored the whole task.

### **6. General features of the developed curricula.**

All the developed curricula share the following features: strong commitment to the University Philosophy-community orientation- detailed description of the characteristics of the graduate, adopting effective learning strategies(student centered, emphasis on practical component, integration of sciences, early exposure to speciality subject matter, inter -professional training), multidisciplinary courses, block courses, detailed time-table for each course, an introduction course at the beginning of each curriculum, continuous supervision of students at all stages of curriculum and involvement of stakeholders.

### **7. Special features of each developed curriculum <sup>(9)</sup>**

#### **7.1. Faculty of Health and Environmental Sciences <sup>(32,33,34,35,36,37,38,39,40)</sup>**

- **(Final workshop 11.4.2012 ).**
- 7.1.1 The Faculty was founded in 1994 and ever since the curriculum has not been reviewed.
- 7.1.2 Degree awarded by existing curriculum (1994)
- B.Sc. (General) in Public and Environmental Health, 8 semesters 147 credit hours.
- **7.1.3 Major development:**
- The Faculty adopted the specializations system in response to the society needs.
- Degree awarded by the developed curriculum (2012).
- B.Sc. (Honours) in Public and Environmental Health:  
specialiations: Food Safety, Epidemiology, Health Education, Environmental Health.
- 10 semesters (8 general and 2 specialiation)
- Total Credit hours= 191 (23 university requirements, 133 faculty requirement, 35 specialiation requirement).
- Examples of content development; new courses introduced: Water Safety and Hygiene, Communication Skills, Environmental Psychology, Occupational Health, School Health.

#### **7.2. Faculty of Dentistry- Final workshop on 12.4.2012 <sup>(5,6,7,8,9,10)</sup>**

- 7.2.1 The Faculty was founded in 2001 and ever since the curriculum has not been reviewed
- 7.2.2 Degree awarded by the existing curriculum and the developed curriculum (2012). No change: Bachelor of Dentistry: 10 semesters. Credit hours: Existing curriculum: 228, and the Developed curriculum: 238 (23 University requirement and 215 Speciality requirement)
- 7.2.3 **Major development**
  - 60% Dentistry and 40% basic and clinical medical sciences
  - Integration of basic, clinical, community and dentistry sciences.

***EDITORIAL***

- Early clinical exposure to dentistry sciences
- Emphasis on the anatomy of head and neck, the central nervous system, histology and biochemistry
- Examples of content development; new courses introduced: Dental Materials, Comprehensive Patient Care, Microbiology and Immunology.

**7.3. Faculty of Applied Medical Sciences: Final workshop**

**23.4.2012.**

7.3.1 The faculty was founded in 1998; Nursing Sciences, Anaesthesia and Intensive Care, Health Psychology. Only the Nursing Sciences programme was reviewed in 2008.

7.3.2 Degree awarded by existing curriculum:

B.Sc. (General) in Applied Medical Sciences specialization: Nursing Sciences, Health Psychology, Anaesthesia and Intensive care. 8 semesters- Credit hours=154.

Direct admission to specialization from the Ministry of Higher Education and Scientific Research- Sudan.

**7.3.3 Major development**

- Establishment of two new specializations; Physiotherapy and Respiratory Therapy.
- Training; 60% practical and 40% theoretical.
- Adoption of inter professional training approach.
- Integration of basic and clinical sciences. - ***Degree awarded by the developed curriculum (8 semesters)*** B.Sc. (Honours) in Nursing Sciences.

B.Sc. (Honours) in Health Psychology, 184 credit hours

B.Sc. (Honours) in Anaesthesia and Intensive Care, 190 credit hours

B.Sc. (Honours) in Physiotherapy,, 189 credit hour

B.Sc. (Honours) in Respiratory Therapy, 196 credit hours

University requirement in all specializations = 23 credit hours

Faculty requirement in all specializations = 14 credit hours

Specializations requirement (147,153,152,159)

Examples of content development: new courses were introduced: Health Psychology (Learning, Production of Educational Materials, Family Mental Health and Geriatric Psychological Care), Anaesthesia and Intensive Care (Regional Anaesthesia, Anaesthesia for Thoracic Surgery, Cardiopulmonary Bypass, and Organ Transplant).

**7.4. Faculty of Animal Production- Final workshop 22.4.2012** <sup>(11,12,13,14,15)</sup> 7.4.1 The Faculty was founded in 1992. First curriculum established in 1996 and was reviewed and developed in 2002

7.4.2 Degree awarded by existing curriculum:

B.SC (Honours) in Animal Production- without specializations 192 credit hours.

7.4.3 Degree awarded by developed curriculum 2012.

## **EDITORIAL**

- B.Sc. (Honours) in Animal Production specialization: Milk Production and Technology, Meat Production and Technology, Fish Production and Technology, Wild Animal Production, Animal

Nutrition, Poultry Production, Animal Breeding and Genetics Improvement

In all specialization the university requirement = 23 credit hours and the faculty requirement= 128 credit hours

### **7.4.4. Major development:**

- Specializations system
- Admission by MHED for the degree B.Sc. (honours) in Animal Production.
- 10 semesters (first 6 semesters= whole class and last 4 semesters for specializations). Selection for specializations by the end of semester 6.
- Total credit hours 202-206.
- Examples of content development; new courses introduced: Animal Behavior and Husbandary, Farm Structures and Environment Control, Farms Planning and Management, Environmental Physiology, Biotechnology, Applied Physics, Quality Control.

**7.5. Faculty of Pharmacy: (Final workshop on 15.4.2012)** <sup>(16, 17, 18, 19)</sup> 7.5.1 The Faculty was founded in 1992 and the curriculum has not been reviewed since foundation.

7.5.2 Degree awarded by the existing and the developed curriculum (no change): Bachelor of Pharmacy (honours). Total credit hours= 201 (no change): (23 university requirement and 178 Specialty requirement).

### 7.5.3 **Major development:**

- Introduction of early exposure for basic pharmacy sciences.
- Integrated modules in semesters 5,6,7,8 (block courses). Each module is designed around a system e.g - Central Nervous System (CNS), Infectious diseases, Pain, Blood, Cardiovascular system (CVS), Gastro intestinal tract (GIT), Respiratory etc. Each module includes; Physiology, Pathology, Anatomy, integrated with Pharmacology, Clinical Pharmacy and Pharmacy Practice and Pharmacy sciences. The new developed curriculum matches with the international approach of pharmacy- patient oriented pharmacy together with Drug oriented pharmacy.

## **Faculty of Medical Laboratory Sciences:**

**Final workshop 18.4. 2012** <sup>(20,21,22,23,24,25,26,27,28,29,30,31)</sup>

7.6.1 The Faculty was founded in 1998 and the curriculum has never been reviewed since foundation.

7.6.2. Degree awarded by the existing curriculum:

Bachelor of Medical Laboratories Sciences (Honours), 8 semesters, 184-181 credit hours.

Degree awarded by developed Curriculum: Bachelor of Medical Laboratories Sciences (honours) specialization; Medical Parasitology, Histopathology, Medical Micro biology, Haematology, Clinical Chemistry.

- First 6 semesters faculty requirement (121 credit hours), last 2 semesters specializations requirement (40 credit hours).

### 7.6.3. **Major development:**

## **EDITORIAL**

- Emphasis on practical training
- Adopting specializations system first 6 semesters (General) and last 2 semesters for specializations. The graduate can practice as a general lab technician in addition to his specialization.
- Practical 60% Theory 40%.
- New courses; Infection Control, Safety Measures, Record Keeping, Informations Technology, Total Quality Management, Normal Histology and cytology, Diseases Vectors, Basic Genetics, Basics of Haematology Epidemiology and Primary Health Care, General inservice training, Molecular Biology, Drug monitoring and Toxicology.
- Establishment of a separate course for each subject e.g Histology- Disease vectors.
- 

### **7.7. Faculty of Agricultural Sciences:<sup>1,2,3,4</sup> Final workshop 29.4.2012**

- 7.7.1. The Faculty was founded in 1975. The curriculum was established in 1978 and amended three times; 1984, 1996 and 1999.
- 7.7.2. Degree awarded by existing curriculum and the developed curriculum (same) B.SC.(honours) in Agricultural Sciences. Specializations: Crop Science, Horticultural Science, Animal Production, Crop Protection, Agricultural Engineering, Agricultural Economics, Food Science, Environmental Sciences and Natural Resources, Soil and Water Sciences, Agricultural Extension, Pesticides and Toxicology.
- 7.7.3. 10 semesters- 201 credit hours (23 university requirement, 97 faculty requirement 81, Specializations requirement ○ First 4 semesters general and the last 6 semesters for the Specializations.

#### **Major development:**

- In an attempt to cope with the rapid advances in agricultural sciences, new courses were added to the curriculum and most of the existing courses were re-written including a lot of new contents.
- The developed Curriculum emphasizes the practical training and the field training and the methods of their evaluation.

### **7.8. Faculty of Veterinary Medicine (41,42,43,44,45,46,47,48,49) 19.4.2012**

- 7.8.1. The Faculty was founded in 2002, the curriculum was established in 2005 and its first review was in 2011.
- 7.8.2. Degree awarded by the existing and developed curriculum: Bachelor of Veterinary Medicine: 10 semesters, 218 credit hours (23 university requirement, 195 Speciality requirements).
- 7.8.3. **Major development**
  - Field training course was designed and given credit hours
  - Introduction of training in the veterinary clinic (Veterinary Clinical Training).
  - Modernization of courses contents. - Introduction of 14 new courses.

New Courses: Botany, Principles of Drugs Manufacturing,  
Veterinary Administration, Veterinary Ethics and Animal Welfare,

## **EDITORIAL**

Milk Production and Technology, Meat Production and Technology, Protozoology, Entomology, Therapeutic Pharmacology, Systemic Pharmacology, Andrology Reproduction Biotechnology, Fish and

Wild life Diseases, Hygiene and Safety of Foods from Animal Origin, Clinic Practice.

- Change of order of 13 courses.
- Change of names of 21 Courses.
- Change of Weights of 16 courses.
- Change of contents of 70 courses.

### **7.9. Faculty of Medicine: (50,51,52,53,54,55,56,57) 29-30.11.2012**

1. The Faculty was established in 1975 and the first curriculum was developed in 1978. The curriculum was evaluated 4 times.
2. The degree awarded by the existing curriculum and the developed curriculum: Bachelor of Medicine and Bachelor of Surgery (MBBS).
3. The developed curriculum: 5 calendar years, 10 semesters and Credit hours **247**.

#### **4. Major development**

In 1978 the faculty developed an innovative curriculum conforming to the philosophy and goals of the University of Gezira. It was the first of its kind in the Sudan; however the Faculty was able to implement it in spite of the strong resistance from the traditional schools. The curriculum proved to be effective in helping the Faculty attain its main objectives: training, provision of service and conducting relevant scientific research. Being convinced by the success of the curriculum in graduating doctors of very high standard, the majority of medical schools (governmental and private) adopted the curriculum. The faculty made major reform in the concepts of medical education nationwide.

Although the original framework of the curriculum was not substantially changed, major development was introduced in it and that was possible because it is dynamic and flexible.

#### **Examples of major development**

Introduction of new courses: professionalism, molecular biology, pharmacology.

Emphasizing the concepts of social accountability and inter professional training.

Re-writing the contents of all the courses; deleting the outdated contents and introducing modern updated contents.

Introducing new training sites; Renal Hospital, Centre of Paediatric surgery, National Institute of cancer, Gezira Cardiac Centre and Gezira Center for assisted reproduction.

## **Conclusion:**

The committee benefited a lot from the reference curricula, the active participation of all the faculties' teachers and the contribution of a large number of renowned national and international experts and that was a major factor in upgrading the 9 curricula to levels comparable to international standards. The developed curricula include the felt needs of the society and the main relevant advances in the subject matter. The process and methodology were simple, clear, feasible and effective and hence they are recommended to be adopted in the future. The committee conformed strictly to the academic regulations of the University of Gezira and that made it possible for the faculties to obtain the final approval of the University Senate.

## ***EDITORIAL***

Eventually the faculties are now implementing modern curricula and all the faculties' teachers are now equipped with a wealth of experience in curriculum development and management.

### **Acknowledgment**

The authors thank specifically the national and international experts whose expertise and support contributed significantly to the success of the work. Thanks to engineers Taj El Sir Hassan Abdul Ati and Abdul Karim Ali Hassan for their generous support of this effort. We acknowledge the remarkable effort of Ustasa Amira Ahmed Omer who managed the secretarial activities efficiently.

### **References:**

1. Model Faculty- Faculties of Agricultural Sector. National Council for Higher Education. Ministry of Higher Education and Scientific Research- Sudan 2011.
2. The National Strategy for the development of the programmes and curricula of higher education- Agricultural and veterinary sciences sector- Syria.
3. The curriculum of agriculture and nutrition (food)- King Saud University-Kingdom of Saudi Arabia (KSA).
4. Curriculum of the Faculty of Agriculture- Alexandria- Egypt.
5. Model Faculty - Faculty of Dentistry Faculties of Health Sector- National Council for Health Higher Education- Ministry of Higher Education and Scientific Research- Sudan
6. Curriculum of the Faculty of Dentistry- University of Khartoum- Khartoum 7. Curriculum of Faculty of Dentistry-Rabat University – Khartoum.
8. The European Society Evaluation of the curriculum of the Faculty of Dentistry King Abdul Aziz University. KSA.
9. Accreditation of the Faculties of Dentistry in Sudan- Sudan Medical Council.
10. The Guidelines of the European Society for Dentistry Learning.
11. Model Faculty- Animal Production- Agricultural, Veterinary, Natural Resources and Environmental Sciences Committee. Ministry of Higher Education and Scientific Research 2004.
12. Model Faculty–Animal Production – Agricultural, Veterinary, Natural Resources and Environmental Sciences- Ministry of Higher Education and Scientific Research 2011.
13. Development and Modernization of the Faculties of the Agricultural Sector Project- Agricultural, Veterinary, Natural Resources and Environmental Sciences- MHED and SR.
14. Report of the committee- Developing Policies for Higher Agricultural Education. Agricultural. Veterinary, Natural Resources and Environmental Sciences- MHED. 2011.
15. The second five years (2012-2016) strategy of the Ministry of Higher Education and Scientific Research- Sudan.
16. Model Faculty- Pharmacy- Faculties of Health Sector MHED and SR- Sudan.
17. Model Faculty of Pharmacy – Arabic Association of faculties of Pharmacy.
18. Accreditation of the Faculties of Pharmacy in the Sudan Medical Council.
19. Guide of the American Board of Accreditation of Pharmacy Education.
20. Model Faculty- Medical Laboratory Sciences- Health Faculties Sector- MHED and SR- Sudan.
21. Curriculum of the Faculty of Medical Laboratory Sciences- University of Khartoum
22. Curriculum of the Faculty of Medical Laboratory Sciences- Sudan University of Sciences and Technology
23. Curriculum of the Faculty of Medical Laboratory Sciences Al Azhari University
24. Curriculum of the Faculty of Medical Laboratory Sciences University of Medical Sciences and Technology
25. Curriculum of the Faculty of Medical Laboratory Sciences El Neilain University
26. Curriculum of the Faculty of Medical Laboratory Sciences University of Shendi
27. Curriculum of the Faculty of Medical Laboratory Sciences International University of Sudan
28. Curriculum of the Faculty of Medical Laboratory Sciences King Fahad University – KSA
29. Curriculum of the Faculty of Medical Laboratory Sciences University of Hellbo Syria
30. Curriculum of the Faculty of Medical Laboratory Sciences University of Atawa- Canada
31. Curriculum of the Faculty of Medical Laboratory Sciences Charles Stewart University
32. Curriculum of the Faculty of Public Health- University of Khartoum- Sudan.
33. Curriculum of the Faculty of Public Health Al Zaeem Al Azhary University- Sudan
34. Curriculum of the Faculty of Public Health Upper Nile University- Sudan
35. Curriculum of the Faculty of Public Health George Washington University- USA
36. Curriculum of the Faculty of Public Health Higher Institute- Alexandria- Egypt
37. Curriculum of the Faculty of Public Health Faculty of Health Sciences- El Sharga- Emirates

***EDITORIAL***

38. Curriculum of the Faculty of Public Health Health - University of Jaizan KSA
39. Model Faculty- Public Health- Faculties of Health Sector MHED and SR- Sudan 2011.
40. Higher institute of Public Health.
41. Model Faculty- Veterinary Medicine- MHED and SR Sudan
42. Curriculum of the Faculty of Veterinary Medicine University of Khartoum
43. Curriculum of the Faculty of Veterinary Medicine University of Niyala
44. Curriculum of the Faculty of Veterinary Medicine Sudan University for Sciences and Technology
45. Curriculum of the Faculty of Veterinary Medicine Bahr El Gazal University
46. Curriculum of the Faculty of Veterinary Medicine Davis University USA
47. Curriculum of the Faculty of Veterinary Medicine Cairo University Egypt
48. Curriculum of the Faculty of Veterinary Medicine Asyoot University Egypt
49. Curriculum of the Faculty of Veterinary Medicine Pitra Malaysia.
50. FMUG self-evaluation report 2008-2009. Mission & objectives, page: 3-4).
51. Abdel Rahim I.M., (1989). Six strategies for effective & relevant medical education as adopted in Gezira Medical School. Saudi Medical Journal 10, 391-395.
52. (FMUG self-evaluation report, 2008-2009. The Educational Programme – 2.1. The principles guiding the design of curriculum, page: 6).
53. FMUG self-evaluation report 2008-2009. The Educational Programme – 2.8. The curriculum structure of the school, page: 10).
54. Graduates booklet – Dean of Academic Affairs, U of G
55. Seefeld, M., Ahmed, B. O., Mustafa, A. E., Ali, M. M. & Ali, G. M. (1989).The approach & major findings of the programme evaluation of Gezira University Medical School, innovation, 10th. Year. World Health Organization Eastern Mediterranean Region Health Services Journal of the; No 6, 32 – 38.
56. Abdel Rahim, I.M., Mustafa, A.E., and Ahmed, B.O. (1992). Performance evaluation of graduates from a community-based curriculum: The housemanship period at Gezira medical school. Medical Education; 26(3): 233 – 240.
57. Merghani, O A and Elsaousi, M E (2007). Problem Based Learning in the Faculty of Medicine-University of Gezira. Gezira Journal of Health Sciences; 3(1): 3-7.