Original Article

Analysing Undergraduate Medical Curricula: Experience from a Saudi Medical College

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Abstract

Background: Curriculum analysis refers to the exploration of different components of the educational process in order to analyse those components and highlight strengths as well as opportunities for improvement. Curriculum analysis examines the curriculum using a multi-faceted approach.

This study aimed to analyse the curriculum of Qassim University College of Medicine (QUCOM); explore its strengths, weaknesses, and areas for improvement; and share a medical curriculum analysis performed in the Saudi context.

Methods: For this study, a qualitative descriptive study was used based on document analysis. All the college's documents from 2001 to 2018 were reviewed. The analysis used Harden's ten questions framework for curriculum development. Thematic analysis was then used to categorise the findings following Harden's ten questions framework.

Results: This study showed that the curriculum was built to meet the needs of the Saudi community and increase the ratio of Saudi to expatriate doctors. The contents of the curriculum were appropriate for medical education, and the methodology was likely to foster life-long learning. A clear path for communication of the curriculum and management of programme provision existed, and the learning environment was found to be motivating. However, no clear representation of improving professionalism, patient safety, or research was found in the curriculum.

Conclusion: The QUCOM curriculum showed great compliance with the student-centred, problem-solving, integrated, community-based, elective, and systematic (SPICES) model. However, many areas for improvement were identified. Adoption of the Saudi Medical Education Directives (SaudiMED) competency framework would achieve excellence in medical education and keep with the aspirations of the Saudi community.

Keywords: Analysing curriculum, Curriculum analysis, Harden's ten questions, Qassim University, QUCOM curriculum

الملخص

خلفية: تحليل المنهج يعني استكشاف المكونات المختلفة للعملية التعليمية بغرض تحليل تلك المكونات وتوضيح نقاط القوة والضعف بغرض إيجاد فرص التحسين. تحليل المنهج يتم باستخدام الطرق ذات الأوجه المتعددة. تهدف هذه الدراسة الى تحليل منهج كلية الطب بجامعة القصيم، المملكة العربية السعودية لاستكشاف نقاط القوة والضعف وطرق التحسين ومشاركة التحليل في الإطار السعودي.

طريقة البحث: لأغراض هذا البحث تم اعتماد البحث الوصفي الكيفي للمستندات. تمت مراجعة المستندات الخاصة بالمنهج للأعوام ٢٠٠١ وحتى ٢٠١٨. اعتمد التحليل على إطار هاردين ذو العشرة أسئلة لتطوير المنهج (جدول ١). تم اعتماد التحليل المبني على المتشابهات لتصنيف المخرجات طبقا لإطار هاردين ذو العشرة أسئلة لتطوير المنهج.

النتائج: أوضحت الدراسة أن المنهج تم تصميمه لمقابلة احتياجات المجتمع السعودي وزيادة نسبة الأطباء السعوديين مقابل الأجانب. محتوى المنهج مناسب للتعليم الطبي وتساعد منهجية التدريس على التعلم المستمر. هنالك مسار واضح لإنفاذ المنهج وتوجد إدارة جيدة للبرنامج التعليمي كما أن هنالك بيئة مناسبة وبناءة للتعلم الا انه لا يوجد خط واضح لتحسين المهنية الطبية وسلامة المرضى والبحث العلمي.

الخلاصة: أظهر تحليل منهج كلية الطب بجامعة القصيم توفقا تاما مع طريقة التعليم المرتكز على الطالب والتعليم المبني على حل المشكلات والمتداخل والمبني على المجتمع والاختياري والمنتظم، لكن هنالك مساحات للتحسين. اعتماد موجهات إطار التعليم الطبي السعودي يؤدي الى التميز في التعليم الطبي والذي يقود الى رفاه المجتمع السعودي.

Introduction

Curriculum is defined as "the statement of the intended aims and objectives, content, experiences, outcomes, and processes of an educational programme, including the following: a description of the training structure, a description of expected methods of learning, teaching, feedback, and supervision" [1]. Additionally,

> a curriculum analysis refers to an effort to tease a curriculum separately into its parts. To analyse those parts and the way they fit together to make a whole, to recognize the beliefs and ideas to which the designers were dedicated and which either explicitly or implicitly shaped the curriculum, and to examine the implications of these commitments and beliefs for the quality of the educational experience. [2]

In other words, the process of analysis examines the curriculum from different approaches. Analysis is important, as areas of strength or weakness in the implemented curriculum are not always apparent to curriculum designers, faculty, or students [3].

Different tools are used in curriculum analysis [2]. Among these tools is Harden's ten questions framework for curriculum analysis, which was developed and proposed by Harden at Dundee University in Scotland in 1986 [4]. This tool has been utilized in several universities worldwide due to its high validity and reliability [5, 6] .

Qassim University College of Medicine (QUCOM) is the first medical school in the Kingdom of Saudi Arabia (KSA) to adopt the problem-based learning (PBL) approach as its prime educational strategy [7]. The college started providing a hybrid PBL and community-oriented medical education in 2001, and the curriculum of the college mainly follows the student-centred, problem-solving, integrated, community-based, elective, and systematic (SPICES) approach to curriculum design [8]. QUCOM was recognized by the World Federation of Medical Education (WFME) in 2014 and by the National Centre of Academic Assessment and Accreditation (NCAAA) in 2016.

This study aimed to analyse the curriculum of QUCOM by exploring its strengths, weaknesses, and areas for improvement and to share an analysis of medical education in the Saudi context.

Methods

As part of a curriculum reform, QUCOM performed a curriculum analysis in April 2018. In this study, a qualitative descriptive study was used based on analysis of the college's documents from 2001 to 2018. The QUCOM curriculum was analysed using Harden's ten questions framework for curriculum development (Table 1). Thematic analysis was used to categorise the findings of the analysis resulting from Harden's ten questions framework.

To ensure the validity of the obtained data, the main curriculum documents were analysed

along with the student manual, programme and courses specifications, assessments regulations, previous self-study reports, reports of external evaluators and accreditors from WFME and NCAAA, and previous published studies from the college's faculty and students.

Results:

Table 1: Ten questions to be asked when planning a course or a curriculum [4]
What are the needs about the product of the training programme
What are the aims and objectives?
What *content* should be included?
How should the content be *organized*?
What educational *strategies* should be adopted?
What teaching *methods* should be used?
How should *assessment* be carried out?
How should details of the curriculum be *communicated*?
What educational *environment* or climate should be fostered?
How should the process be *managed*?

Table (2) learning Objectives of QUCOM

• Utilize his skills in information management effectively to retrieve relevant information, analyze it critically, and apply it to the solution of clinical/health problems in a scientific reasoning manner
• Use an evidence-based approach to apply the most effective and up-to-date knowledge, skills, values, and attitudes in his medical practice and in his pursuit of postgraduate studies and life-long learning
• Identify, diagnose, evaluate and manage common or serious health problems competently in individual patients, families, and the community, with special reference to Saudi Arabia, including provision of care for high-risk groups and follow-up measures
• Educate and counsel patients and others (especially in the promotion of health and healthy life style, prevention of disease and securing consent) using effective communication skills
• Observe medical ethics strictly in his practice, in the efficient and optimum use of available resources and their equitable allocation especially for minority, disadvantaged and high-risk groups
• Help patients adjust to their condition when managing clinical problems with due consideration to the family and social environment, and the personal needs, limitations, and abilities of each patient;

• Refer cases beyond his capacity whenever required and extend support, empathy, respect, and friendliness to the patient, family members and relatives without traversing the bounds of professionalism and medical ethics
• Diagnose and manage common emergencies and deal with unfamiliar situations
• Work effectively and harmoniously within a health team that includes physicians, other health and health-related personnel, and community members or agencies
• Participate in peer review activities and respond positively to constructive criticism
• Act as a change agent and contribute to community development with special reference to the development and success of health care programs and health institutions
• Conduct relevant health research to contribute to the solution of health problems and the evolution of medicine

Table (3) contents of QUCOM curriculum

Knowledge:
• A comprehensive understanding of coherent manner normal structure and function of human body during the different stages of life • Awareness of the various types of human diseases with their pathogenesis and clinical manifestations, and their impact on patient and community • Principles of management of the various human diseases
Patient encounter Skills
• Appropriate professional communication with patients, and performance of physical examination and basic medical diagnostic and interventional procedures with consideration of patient safety as the core of the health care process
Clinical Reasoning Skills,
• Interpretation of data obtained through patient encounter, its integration with medical knowledge from relevant sources and critically-evaluating it for evidence-based decision making regarding health of individuals and community. • Development of management plans for health problems of the individuals and community.
Life-long learning skills
• Empowering the potential for advancing personal learning and professional development through self-directed continuous medical education

Research Skills
• Understanding the basic principles and steps of medical research, and apply relevant bio-statistical techniques in evidence based medical practice and research.
Communication and Presentation skills
• Written and oral communication skills with colleagues, patients and other stakeholders of health care settings
Teamwork skills
• Ethical and professional behavior in personal and professional relationships, effective participation in health care team, and exercise leadership when appropriate

Table (4) Instructional methods used in QUCOM Curriculum

Problem-based learning
Bed-side teaching
Self-directed learning
Case-discussion sessions
Interactive lecture
Simulation-based education
laboratory sessions
Students-led Seminar
Community based learning activities
Online discussion forums
Students assignments
Students research
Team-based learning
Evidence-Based Learning Sessions
Medical audit

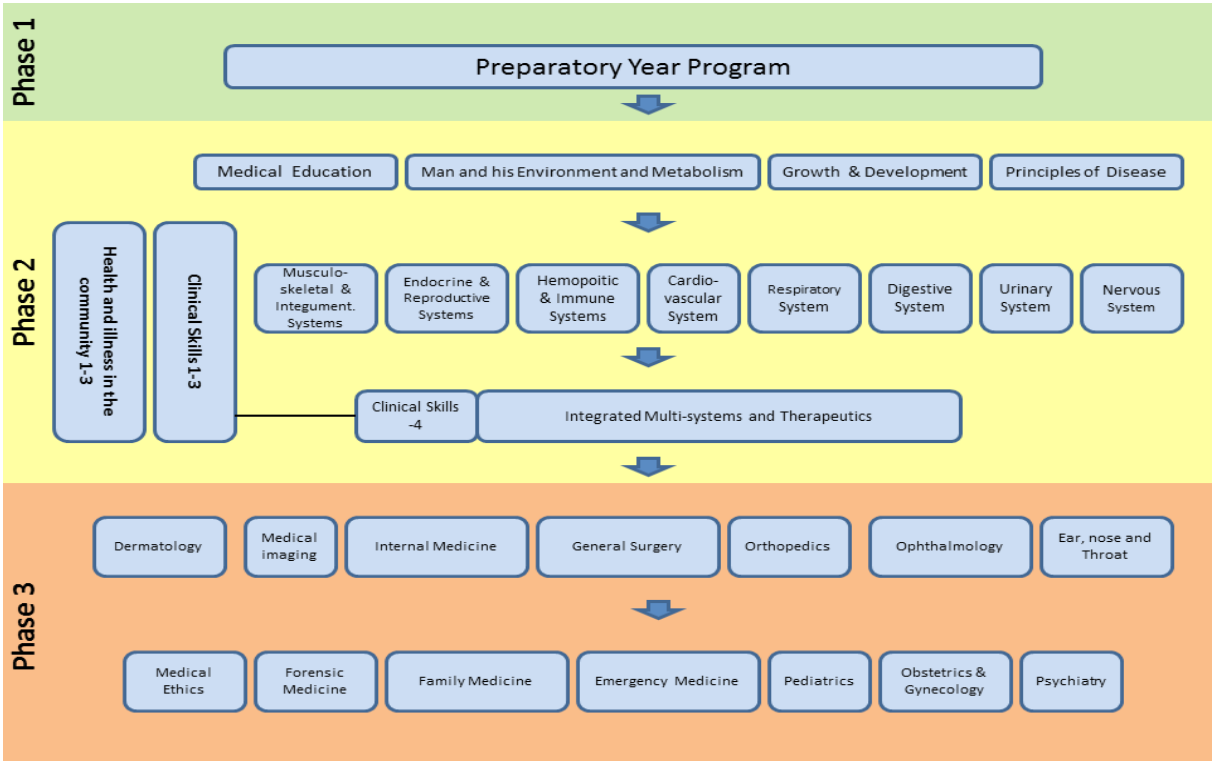


Figure (1) Organisation of QUCOM curriculum (Curriculum Map)

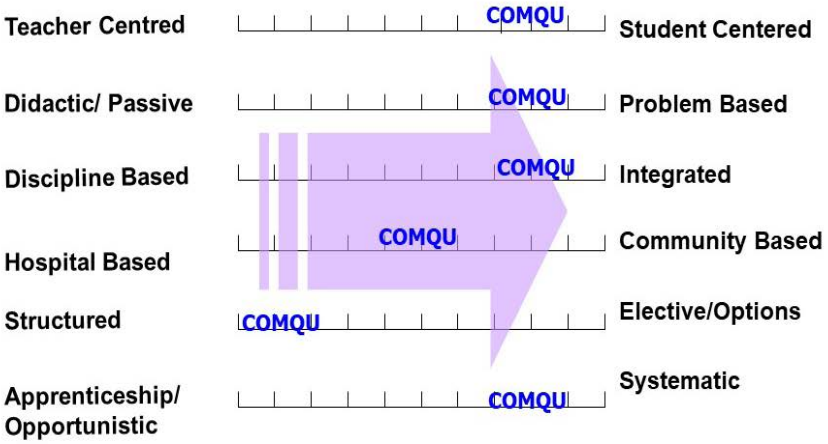


Figure (2) Evaluation of QUCOM at SPICES continuum by external reviewers 2014

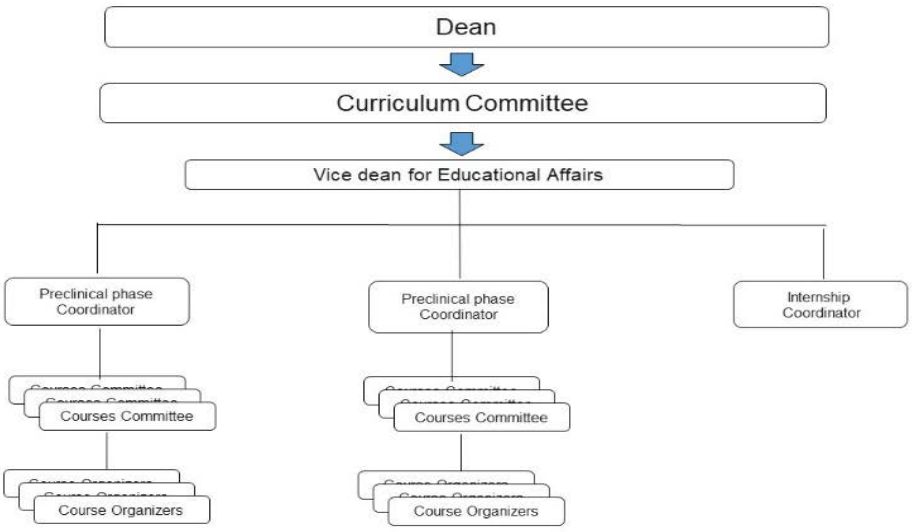


Figure (3) QUCOM Organisational Curriculum Management

The results of the present study are presented following the order of Harden's ten questions as listed in Table 1.

Question 1: What are the needs about the product of the training programme?

The curriculum was designed to meet the national requirements for qualified Saudi physicians, to reduce the country's dependence on expatriate physicians [9], and to improve the physician-to-patient ratio, thus complying with the Strategic Plan for Higher Health Education of the KSA [10]. Curriculum designers adopted a multi-faceted approach to explore problem identification and needs assessment. The needs assessment was performed using the Wisemen approach and Delphi technique and considered community needs and expectations from medical graduates. The obtained data were reviewed considering more than 25 undergraduate medical curricula at national, regional, and international levels. After this assessment and review, the curriculum was developed.

Question 2: What are the aims and objectives?

This curriculum aimed to graduate physicians capable of safely serving their community and continuing life-long learning and self-guided professional development. The curriculum objectives covered the knowledge, skills, and attitudes of the graduates; these objectives are shown in Table 2 [7,11].

Question 3: What content should be included?

The current QUCOM curriculum was built on seven components, shown in Table 3: knowledge, patient interaction skills, clinical reasoning skills, life-long learning skills, research skills, communication and presentation skills, and teamwork skills.

Question 4: How should the content be organized?

The QUCOM curriculum was comprised of 35 medical courses in addition to six social and cultural courses. These courses were organised in three phases, as follows (Figure 1):

1. **Phase 1** was comprised of a preparatory year programme, in which students were exposed to essential learning skills, communication skills, and medical ethics. In addition, the students' English language skills were improved during this time.
2. **Phase 2** was composed of three stages that students were sequentially exposed to:
    a. Introductory, contextual courses about the fundamentals of the human body and disease processes and social and cultural courses.
    b. Trans-disciplinary body systems courses in which each body system was examined in both normal and disease circumstances. In parallel, students were exposed to longitudinal courses exploring health and disease in the community and providing clinical skills training in a controlled atmosphere.
    c. A course targeting the integration and inter-relations of different body systems with a parallel skills course in which students met with patients under strict supervision.
3. **Phase 3** was the clerkship phase in which bed-side teaching and patient interactions through different rotations comprised the core of the learning processes. During the fifth year, after studying Internal Medicine and/or General Surgery, students were exposed to the Family Medicine and Emergency Medicine rotations to emphasize common medical problems in the community and situations requiring early intervention.

After successfully passing all courses of the programme, the students began their internship year, which included three rotations each in Internal Medicine, General Surgery, Paediatrics, and Obstetrics and Gynaecology, in addition to optional specialities.

Question 5: What educational strategies should be adopted?

QUCOM adopted the SPICES educational strategies model [8] with minor modifications. The analysed curriculum contained no elective courses, and all courses were compulsory. Figure 2 shows the evaluation of QUCOM's educational strategies in relation to the SPICES model according to external reviewers.

Question 6: What teaching methods should be used?

A broad range of learning opportunities and learning methods were described in this curriculum. The analysis showed that these methods were fostering a student-centred learning approach and life-long learning and that they included effective guidance from the faculty (Table 4).

Question 7: How should the assessment be carried out?

The assessment strategy in the college included formative (assessment for learning) and summative (assessment of learning) components. A wide range of methods were utilized in this curriculum, including continuous assessment by the supervisor, logbooks, multiple-choice questions, problem-solving questions, objective-structured practical examinations (OSPE), objective-structured clinical examinations (OSCE), student presentations, and research projects. Additionally, QUCOM is the leading college in Saudi Arabia in the multi-institutional progress test (PT). From May 2012 to March 2018, 10 rounds of the PT have been conducted, with the participation of more than 25,000 students in 27 colleges of medicine.

Question 8: How should details of the curriculum be communicated?

The QUCOM curriculum details were communicated through the student manual, which included the course objectives, contents, teaching and learning methods, and assessment methods. In addition, a session was held at the beginning of each course in which the students were introduced to the course by the particular course coordinator. Additionally, all course materials were uploaded to the learning management system, and students were introduced to the college's curriculum and educational approach through their introductory medical education course.

Question 9: What educational environment or climate should be fostered?

The present analysis showed that QUCOM exerted great efforts to establish a motivating learning environment through strong academic guidance and support, clear communication channels with faculty, and comfortable learning resources. In 2012, Al-Mohaimeed evaluated the learning environment of QUCOM using the Dundee Ready Educational Environment Measurement (DREEM) [12]. In his study, student perceptions toward QUCOM's educational environment were positive; they expressed that the college was well organized, that the teaching was stimulating, and that the atmosphere was relaxed.

Question 10: How should the process be managed?

The preparatory year programme was managed by specific deanship under university supervision. During phases 2 and 3, the medical programme was managed by the QUCOM administration, the Dean and Vice Dean of Educational Affairs. The entire process was overseen by the Curriculum Committee. Phase coordinators, course committees, and course organizers were responsible for programme provision at relevant levels (Figure 3). The course committees and course organizers were responsible for communicating the detailed timetable and the implementation of specified courses. Phase coordinators were responsible for monitoring the curriculum implementation in the trans-disciplinary body system courses and the clerkship phase, and

they were supervised by the Vice Dean for Educational Affairs. Major curriculum modifications were proposed by the Curriculum Committee and were subject to the approval of the QUCOM Council and, eventually, the University Council.

Discussion

Curriculum analysis in medical education is a vital process for identifying areas of strengths and weaknesses in the implemented curriculum that are not always apparent to curriculum designers, faculty, or students [2]. This study aimed to analyse the curriculum of QUCOM and explore its strengths, weaknesses, and areas for improvement. The tools used in this analysis have been used worldwide and have shown high validity and reliability (5, 6)

Analysis of the QUCOM curriculum showed that the current curriculum was designed to meet the national needs of the Saudi community. The methodology used in the curriculum design was scientific and followed the international standards (1, 13, 14). However, recent trends in medical education are moving toward competency-based medical education (15, 16). The SaudiMED competency-based framework was published in 2011 [17] and was approved as the national framework for medical education in Saudi Arabia [18]. By adopting this approach, the medical curriculum would fully address the needs of the community.

This present analysis also found that the existing curriculum aimed to graduate physicians capable of safely serving their community and continuing life-long learning and self-directed professional development. While the current curriculum map (Figure 1) did not specify how infection control, patient safety, or professionalism were learnt, analysis of other curriculum documents showed that these tenants were incorporated as integral parts of different courses. A growing body of literature has suggested increasing the incorporation of these competencies were incorporated into undergraduate medical curricula [19]–[22]. Therefore, these tenants should be more apparent and carry more weight in the QUCOM curriculum.

Training in research was also suboptimal in the current curriculum, as it was a part of health and illness courses. Undergraduate medical students should be trained in research in different ways, including research methodology courses, student research projects, and journal clubs [23, 24]. A standalone course for research methods should exist, followed by real practice, as an integral part of the curriculum. This was also recommended by QUCOM students in a previous study [25].

The SPICES model was well represented in the QUCOM curriculum, and the instructional methods used in the college were nearly all student-centred. However, a teacher-centred approach still existed in the curriculum. Great efforts were exerted by the college to improve the instructional methods through a faculty development programme, as well as through introducing new teaching methods, such as a flipped classroom. Flipped classrooms have

been shown to be effective for undergraduate medical education [26], [27].

Furthermore, the current study revealed the systematic, horizontal and vertical integration of the curriculum. As mentioned, there were no elective courses. Studies have shown that elective courses in undergraduate medical education provide unique opportunities for students to design and organize individualized educational experiences [28], [29]. The introduction of elective and optional courses should be considered in the reform process.

The current analysis revealed that training in community settings represented almost 10% of the entire curriculum. This was markedly low compared to other colleges in the region adopting community-based medical education, such as Faculty of Medicine Gezira University in Sudan and Faculty of Medicine of Suez Canal University in Egypt (25% and 20%, respectively) [30], [31]. Increasing the weight of community-based training is a main component of the SaudiMED competency framework [17].

The current analysis of the QUCOM curriculum indicated that it was built on seven objectives, including knowledge, patient interaction skills, clinical reasoning skills, life-long learning skills, research skills, communication and presentation skills, and teamwork skills. These competencies were in agreement with international competency frameworks worldwide, as well as the SaudiMED framework [18, 32–34].

The current analysis also revealed that the curriculum used both formative and summative assessment with a variety of assessment methods targeting all intended programme learning outcomes. However, the study also found that there was no exit exam at the end of the curriculum. The use of an exit exam is considered a part of quality assurance and was recommended by accreditors from the WFME and NCAAA. Recent studies have shown the significance of incorporating an exit exam for undergraduate medical education [35], [36].

One strength of this curriculum was the presence of the PT. QUCOM is the leading college in the region in designing and implementing the multi-intuitional PT. More than 25,000 students from 27 colleges have sat for this test through its 10 rounds from 2012 to 2018.

The analysis also revealed positive learning environment. The learning environment of QUCOM, as shown by Al-Mohaimeed's study in 2012, was positive compared to national and international colleges of medicine [12].

This current study had several strengths, including the method with which the study examined the curriculum and other related documents beginning with the establishment of QUCOM. Moreover, it included previous self-study reports and feedback from external evaluators and accreditors, providing a sort of triangulation of the obtained data. However, some limitations also existed, as the current study depended mainly on existing documents. Therefore, further qualitative and

quantitative studies are needed

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References:

[1] J. Grant, "Principles of curriculum design," Underst. Med. Educ. evidence, theory Pract. ChichesterWiley Blackwell, 2010.

[2] G. Posner, "Analyzing the Curriculum. 3rd." Xi 'an: Shanxi Normal University Press, 2005.

[3] F. Laskaratos, D. Gkotsi, and E. Panteliou, "A critical review of the core medical training curriculum in the UK : A medical education perspective," vol. 5, no. 1, pp. 1–8, 2013.

[4] R. M. Harden, "Ten questions to ask when planning a course or curriculum," Med. Educ., vol. 20, no. 4, pp. 356–365, 1986.

[5] Ahmed YA, Alneel S. Article, "Analyzing the curriculum of the faculty of medicine, University of Gezira using Harden's 10 questions framework," vol. 5, no. 2, pp. 60–66, 2017.

[6] H. Arzuman, "Undergraduate Medical Curriculum of Universiti Sains Malaysia in terms of Harden ' s Ten Questions of Curriculum Development," vol. 5, no. 2, pp. 3–8, 2011.

[7] [7] A. S. Alamro and S. Schofield, "Supporting traditional PBL with online discussion forums: A study from Qassim Medical School," Med. Teach., vol. 34, no. sup1, pp. S20–S24, Apr. 2012.

[8] R. M. Harden, S. Sowden, and W. R. Dunn, "Educational strategies in curriculum development: the SPICES model," Med. Educ., vol. 18, no. 4, pp. 284–297, 1984.

[9] [9] SCFHS, "Saudi Commission for health specialities," Saudi Commission for Health Specialities. [Online]. Available: https://www.scfhs.org.sa/en/mesps/Pages/Default.aspx.

[10] A. Telmesani, R. G. Zaini, and H. O. Ghazi, "Medical education in Saudi Arabia: a review of recent developments and future challenges/Enseignement medical en Arabie saoudite: revue des recentes evolutions et des defis a venir," East. Mediterr. Heal. J., vol. 17, no. 8, p. 703, 2011.

[11] B. Shamsan, A. S.-I. journal of health sciences, and undefined 2009, "Evaluation of problem based learning course at college of medicine, Qassim University, Saudi Arabia," ncbi.nlm.nih.gov.

[12] A. Al-Mohaimeed, "Perceptions of the educational environment of a new medical school, Saudi Arabia.," Int. J. Health

Sci. (Qassim)., vol. 7, no. 2, pp. 150–9, Jun. 2013.

[13] P. A. Thomas, Curriculum development for medical education: a six-step approach. JHU Press, 2015.

[14] J. G. Grants, "Curriculum evaluation in medical and health-care education," 1985.

[15] J. R. Frank et al., "Competency-based medical education: theory to practice," Med. Teach., vol. 32, no. 8, pp. 638–645, 2010.

[16] R. M. Harden, "Trends and the future of postgraduate medical education," Emerg. Med. J., vol. 23, no. 10, pp. 798–802, 2006.

[17] R. G. Zaini, K. A. Bin Abdulrahman, A. A. Al-Khotani, A. M. A. Al-Hayani, I. A. Al-Alwan, and S. D. Jastaniah, "Saudi Meds: A competence specification for Saudi medical graduates," Med. Teach., 2011.

[18] The Saudi Deans Committee."SaudiMEDs framework," Saudi Medical Education Directive , " pp.1-34, 2017.

[19] J. R. Frank, R. Mungroo, Y. Ahmad, M. Wang, S. De Rossi, and T. Horsley, "Toward a definition of competency-based education in medicine: a systematic review of published definitions," Med. Teach., vol. 32, no. 8, pp. 631–637, 2010.

[20] "Competency-based medical education An overview and application in pharmacology." .

[21] D. Dath, W. Iobst, and I. C. Collaborators, "The importance of faculty development in the transition to competency-based medical education," Med. Teach., vol. 32, no. 8, pp. 683–686, 2010.

[22] H. O'Sullivan, W. Van Mook, R. Fewtrell, and V. Wass, "Integrating professionalism into the curriculum," Med. Teach., vol. 34, no. 2, pp. 155–157, 2012.

[23] C. Ringsted, B. Hodges, and A. Scherpbier, "'The research compass': An introduction to research in medical education: AMEE Guide No. 56," Med. Teach., vol. 33, no. 9, pp. 695–709, 2011.

[24] L. N. Burgoyne, S. O'Flynn, and G. B. Boylan, "Undergraduate medical research: the student perspective.," Med. Educ. Online, 2010.

[25] M. Alsuhaibani, A. Alharbi, S. N. B. Inam, A. Alamro, and M. Saqr, "Research education in an undergraduate curriculum : Students perspective," vol. 13, no. 2, 2019.

[26] F. Chen, A. M. Lui, and S. M. Martinelli, "A systematic review of the effectiveness of flipped classrooms in medical education," Medical Education. 2017.

[27] C. Tan, W.-G. Yue, and Y. Fu, "Effectiveness of flipped classrooms in nursing

education: Systematic review and meta-analysis," Chinese Nurs. Res., 2019.

[28] A. Lumb and D. Murdoch-Eaton, "Electives in undergraduate medical education: AMEE Guide No. 88," Med. Teach., vol. 36, no. 7, pp. 557–572, 2014.

[29] B. Kumwenda, J. Dowell, K. Daniels, and N. Merrylees, "Medical electives in sub-Saharan Africa: A host perspective," Med. Educ., 2015.

[30] S. Elsanousi, M. Elsanousi, O. Khalafallah, and A. Habour, "Assessment of the social accountability of the faculty of medicine at University of Gezira, Sudan," EMHJ-Eastern Mediterr. Heal. J., vol. 22, no. 4, pp. 258–266, 2016.

[31] S. Hosny, M. Ghaly, and C. Boelen, "Is our medical school socially accountable? The case of Faculty of Medicine, Suez Canal University," Med. Teach., vol. 37, no. S1, pp. S47–S55, 2015.

[32] P. Rubin and D. Franchi-Christopher, "New edition of Tomorrow's Doctors," Med. Teach., vol. 24, no. 4, pp. 368–369, 2002.

[33] J. R. Frank, L. Snell, and J. Sherbino, "The draft CanMEDS 2015 physician competency framework–series IV," Ottawa R. Coll. Physicians Surg. Canada, 2014.

[34] D. J. Schumacher, M. P. Frintner, A. Jain, and W. Cull, "The 2011 ACGME standards: impact reported by graduating residents on the working and learning environment," Acad. Pediatr., vol. 14, no. 2, pp. 149–154, 2014.

[35] J. E. F. Fitzgerald, C. E. B. Giddings, G. Khera, and C. D. Marron, "Improving the future of surgical training and education: Consensus recommendations from the Association of Surgeons in Training," Int. J. Surg., 2012.

[36] S. Craig, N. Tait, D. Boers, and D. McAndrew, "Review of anatomy education in Australian and New Zealand medical schools," ANZ J. Surg., 2010.