Faculty members’ perception towards changes in Medical Education in Saudi Arabia

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Abstract

Introduction and aim: Medical Education journey in Saudi Arabia started from about 50 years ago, however, it witnessed a lot of changes and rapid development in the last 10 years especially with the increase the number of medical colleges. Medical Education in Saudi Arabia seems to follow the same international pattern regarding the change process. There is a great need for a rigorous approach for evaluating the effectiveness of this changes and the process of its management. The aim of this study is to evaluate medical education change in Saudi Arabia from Faculty Staff Members’ point of view.

Method: The research was conducted through a cross-sectional study using a survey and grounded theory, as a mixed methods strategy.

Results: The challenge that has the highest perception was the shortage of well-trained Faculty Staff Member. The strategies for implementing change are categorized into three categories: Curriculum reform, faculty development and improving learning environment.

Conclusion: Change could be implemented through curriculum reform with the help of qualified Faculty staff members in presence of an enabling learning environment and supportive organizational measures. In Saudi Arabia, a variety of strategies was used for implementing change in medical education, without any preference to specific one.

Keywords: Evaluation, Medical Education, Change, Saudi Arabia

Introduction

Medical Education Context in Saudi Arabia and response to current challenges
The year 1967 witnessed the establishment of the first medical school in Saudi Arabia in King Saud University with the partnership with London College of Medicine. After eight years, two more medical schools were established at King Abdulaziz University and King Faisal University. In 1980 the fourth medical college was established in Abha by King Saud University. For more than fifteen years, there was no more establishment of new medical college, till the year of 1996 when Umm Al-Qura University established its medical college which is considered the last medical college to be established in the first phase of medical education in Saudi Arabia. The five medical colleges followed to a great extent the same traditional curriculum of six years duration with an internship year. The first three years was for the basic medical sciences and the second three years was for the clinical phase of the program. The first phase of medical education in Saudi Arabia lasted for about thirty years. A teacher centred approach of teaching was common among the five former medical colleges (Bin Abdulrahman, 2011).

The earlier calls and report for changing medical education in Saudi Arabia was in the early 2000s. These calls and reports were due to the concerns related to the disadvantages of traditional curriculum and the real desire to shift to more student centred learning and outcome based education. Another concern was raised due to overcrowding of the curriculum, inclusion of some irrelevant topics (Elfaki, 2004, Al-Shehri, 1999, Shawky, 2001 and Milaat, 1994). Some not all reports highlighted the poor teaching environment in the traditional didactic programs. An important debate among Saudi academics was raised due to the divergence between the content of medical programs and the expected outcomes of their graduates (Al-Shehri, 1999, Shawky, 2001 and Ahmed, 2002). These concerns and debate were the drive for the first wave of medical curriculum reform in almost all colleges of medicine in Saudi Arabia. This reform was mainly towards more self-directed learning and student centred approach (Khalid, 2008 and Harden, 2001) Many discussions about the importance of introducing evidence based medicine was raised among academics and Deans of medical colleges in Saudi Arabia (AlFaris, 2006).

The second phase of medical education in Saudi Arabia witnessed the establishment of many new universities and colleges of medicine. There was strong support from the Ministry of Higher Education for medical education in particular to help to close the gap due to the shortage in the number of health care providers in the Kingdom especially the physicians. By the year 2008, there were 21 medical colleges in Saudi Arabia; three of them private colleges. In the year 2011, the number of medical schools in Saudi Arabia became 31 schools, both governmental and private, which means 10 new schools were established in only three years. (Bin Abdulrahman, 2011).

This phase also witnessed the establishment of the National Commission for Assessment and Accreditation (NCAAA) which is responsible for accrediting all higher education in institutions and programs in Saudi Arabia. There was a paradigm shift of medical education program toward innovation and a more student centred approach. A variety of curricula were adopted in different colleges with the common features of adopting: more integrated curriculum, problem based learning, and community based learning. The difference between colleges was mainly in the extent and depth of each approach. Some colleges adopt a pure problem based and community oriented curriculum and others adopt a hybrid integrated community based or problem based curriculum. On the other hand some schools remained on its traditional curriculum with attempts to introduce new teaching strategies to improve the learning environment (Telmesani, 2011).

One of the milestones of the second phase of medical education was the development of Saudi Med which is a national competence framework of seven domains that could guide curriculum development and ensure equivalent standards among medical colleges in Saudi Arabia. This framework was developed by the collaboration between The Saudi Deans Committee and the Saudi Society for Medical Education, both have an active role in the field of medical education in Saudi Arabia (Zaini, 2011).

Finally the establishments of many medical education departments in colleges of medicine reflected the high interest
of developing and monitoring medical education in Saudi Arabia. Also, this interest was reflected in the number of published medical education researches originally come from Saudi Arabia and for this reason Medical Teacher journal with the collaboration with Dr. Hamza Alkholi Chair for Developing Medical Education in Saudi Arabia published the Saudi supplement of this prestigious journal (Bin Abdulrahman, 2012).

In conclusion, the Medical Education journey in Saudi Arabia started from about 50 years ago, however, it witnessed a lot of changes and rapid development in the last 10 years especially with the increase the number of medical colleges, about 25 medical schools were established in the last 10 years with an average of more than two colleges per year. Medical Education in Saudi Arabia seems to follow the same international pattern with main differences in the rate of growth and the rate of change; both are so rapid in comparison with the international trends. This added more pressure on medical colleges especially in the area related to quality of educational programs and quality of outcomes. There is a great need for a rigorous approach for evaluating the effectiveness of this change and even the process of its management. There is no published data about evaluating the effectiveness of the change in medical education in Saudi Arabia which could be explained by the short period of this change.

The aim of this study is to evaluate change in medical education in Saudi Arabia from Faculty members’ point of view, with an emphasis on the challenges and strategies related to its implementation.

**Figure 1: Conceptual framework for change management in Medical Education (Hassanien, 2016)**

**Methodology**
The research methodology framework proposed by Saunders 2009 was followed for study design. The research was conducted through a cross-sectional study using a survey and grounded theory, as a mixed methods strategy. The study's approach is a combined deductive and inductive, based on both positivism and interpretivism philosophies.

Fig. 2

### Philosophies:
This study, has followed a combined method (triangulation) approach as survey and interview are chosen to verify various aspects of research study. Using survey is supported by "positivist" to examine underlying assumptions related to the challenges facing medical education in Saudi Arabia and established by literature review. On the other hand, "interpretivist" approach is followed when analysing and interpreting data coming from the interviews.

### Approaches:
Also a combined approach was followed in this study, both Deductive and Inductive. Deductive approach is the approach followed on evaluating the challenges facing medical education in Saudi Arabia, while both deductive and inductive approach were followed for evaluating the strategies followed for change implantation.

### Strategies:
Among different research strategies, this study was conducted using a survey questionnaire and semi-structured interview as a research strategy.

### Choices, Quantitative vs Qualitative study:
A mixed method was used in this study, combined quantitative and qualitative to eliminate the limitation of each method and to get more understanding of the topics of the study.

### Time horizon:
This study taken particular time of "snapshot", so it is considered a cross-sectional study.
6. Data Collection and Data Analysis:
   a. Data collection: Quantitative data was collected using online questionnaire and qualitative data was collected from semi-structured interview.
   b. Sample selection: The participants of this study (74 in the questionnaire and six in the interview) are experts in medical education from different Medical and Dentistry colleges in Saudi Arabia. As there is no available data base for all those experts, it was difficult to accurately calculate the sample size for the study. Participants were mainly members of "Nice Group" which is a Whatsapp group that has 187 medical educationists from different areas of Saudi Arabia. Some participants were purposively selected by the author, as they are well known as a medical education experts in Saudi Arabia.

I - Quantitative data collection and analysis

A questionnaire was designed to collect quantitative data from faculty members of medical colleges in Saudi Arabia. The questionnaire has three components:

   a. Participants’ demographic data, including their university affiliation, gender, academic rank, qualifications and duration of career.
   b. Twenty Questions about the challenges facing medical education in Saudi Arabia. For purpose of comparing and discussing the results, those questions were categorized into five categories.
   c. Twenty Questions related to strategies for implementing changes in Medical Education in Saudi Arabia.

Sections B and C featured a Likert rating scale from 1 to 5. The questionnaire was conducted online using Google Docs.(https://goo.gl/forms/PzJdDU7WryBB6zYw2)

Data was collected in an Excel sheet and analysed for descriptive statistics. For purpose of comparing and discussing the results, both section B and C questions were categorized into five and three categories respectively.

The questionnaire was validated by giving it to three experts in Medical Education to check it for: coverage of the topic, avoidance of ambiguity and clear language. Also, the questionnaire was piloted by giving it to ten Faculty members to check also for any ambiguity that needed correcting and clarity of language. According to the validation process, two questions were omitted as being considered of no significance to the study, also rearrangement of some questions was done to keep participants' attention.

II - Qualitative data collection and analysis

A semi-structured interview was used to collect qualitative data from six experts in medical education and the grounded theory approach was followed to analyse the data obtained from the transcripts of each interview. The interview was designed to have two main themes: Different experience with medical education change in Saudi Arabia and Different strategies for change management in medical education. Qualitative data analysis was done using grounded theory with the aim to build a conceptual framework for management change in medical education in Saudi Arabia.
Application of the grounded theory in the current study:

The Grounded theory procedures:

Grounded theory was applied in three levels of analysis (Strauss and Corbin 1990):

1. Data presentation without abstraction or interpretation, just as told by participants in the interview.
2. A descriptive narrative was created using interview transcript, field notes and my own interpretations.
3. A theory or conceptual framework was built using a high level abstraction and interpretation.

Measures taken to enhance the research' quality:

1. **Ethical consideration**: Ethical guideline of York St John University was followed by completing Research Ethical Considerations Screening Checklist.
2. **Reliability and Validity**: Some measures were taken to improve both reliability and validity of this study.
   a. **Reliability**: four measures were taken to ensure reliability of current study, they are: Research methodology was fully explained, research questions were clearly stated, Researcher role was fully described in later section and finally an audit trail was kept. The audit trail contains: Excel sheet for the data of online questionnaires, interview data, quantitative data statistics and Grounded theory memos and coding sheets.
   b. **Validity**: The following techniques were followed to increase the validity of the current study which is mainly through:
      
      **Data source triangulation**: It has three types, Personal, space and time. Data was collected from diverse experts of medical education from different medical and dental schools in Saudi Arabia, this is to ensure both personal and space triangulation. The link of online questionnaire was sent twice with one month period apart to ensure time triangulation. These measures which enhance data source triangulation gave a good chance to increase the accuracy of data and decrease the chance of getting random errors from premature inference. Also using both qualitative and quantitative data collection methods were one of the measures of data source triangulation.

Results

Table 1: illustrated the demographic data of study's participants, 55.4% were male and 44.6 were female faculty members. The majority of them (85.1%) are from different colleges of medicine in Kingdom of Saudi Arabia and (14.9%) from different dentistry colleges. More than two thirds of them are holding PhD and have more than ten years of experience in medical education.

Table 1: Demographic data

(Total number of participants 74 Faculty members)

| Gender   | Male: 41 (55.4%) | Female: 33 (44.6%) |
|----------|------------------|--------------------|
| College  | Medicine:63 (85.1%) | Dentistry:11 (14.9%) |
Table 2 and 3 illustrated Faculty staff members’ perception towards the challenges facing medical education in Saudi Arabia. Table 2 illustrated the descriptive data of Faculty’s perception for the twenty statements represented various challenges facing medical education. The data was represented in terms of mean and standards deviation. For the purpose of comparing data and discussing various challenges, the twenty statements were assembled into five themes that represent the main challenges. The descriptive data of the main themes were illustrated in Table 3, combined with the results of statistical comparison of different means. The challenges related to shortage of qualified Faculty members shows the highest mean (4.4 ± 0.1) and that related to the advancement in information technology shows the lowest mean (3.6 ± 0.1). On comparing all themes using both ANOVA and Holm-Sidak method, there were significant differences between means.

Table 2: - Faculty members’ perception towards Challenges facing medical Education in Saudi Arabia

| No | Item                                                                 | Mean | St.Dev. |
|----|----------------------------------------------------------------------|------|---------|
| 1  | Increase demand for health care providers                           | 4    | 0.9     |
| 2  | Need for qualified physicians who can deal with the changes in the health care environment | 4.05 | 1.1     |
| 3  | Need for qualified physicians who can cope with the explosion of medical knowledge | 4.15 | 1.1     |
| 4  | Movement of medical care from traditional hospitals to ambulatory settings | 3.65 | 1.0     |
| 5  | Patients demand more personal and human communication and touches when receiving care | 4.3  | 1.0     |
| 6  | Increasing level of health awareness and information among patients and even the general public | 4.2  | 0.8     |
| 7  | Easily available and accessible information and knowledge made possible by the internet | 3.55 | 1.1     |
| 8  | Medical Education Curricular emphasis on learners’ need to demonstrate competencies, rather than knowledge acquisition | 4.4  | 1.0     |
| 9  | More emphasis on the shift from content based- to outcomes-based curricula | 4.55 | 0.8     |
| 10 | More emphasis on making the medical education curriculum more student-centred than teacher-centred | 4.2  | 1.3     |
More emphasis on making the medical education curriculum more modular or systems-based than discipline-based

More emphasis on making the medical education curriculum more integrated both horizontally and vertically

More emphasis on making the medical education curriculum more problem-oriented

More emphasis on making the medical education curriculum more technology-oriented

The need for maintaining and assuring quality of Medical Education and satisfying the requirements of national and international accreditation

Shortage of qualified Faculty members, especially with the increase in number of Medical colleges

A new generation of learners who are described as "digital natives"

Current learners have high expectations for their learning to reflect their expertise through a technology-enhanced environment.

Problems related to students' proficiency of English language.

Rapidly changing technology in all medical fields.

Table: 3 comparing themes related to Challenges facing medical Education in Saudi Arabia

| No | Item                                                                 | Mean | St.Dev. | P Value* (One Way ANOVA) | P Value ** (Holm-Sidak method) |
|----|----------------------------------------------------------------------|------|---------|--------------------------|-------------------------------|
| 1  | Challenges related to stakeholders’ needs                           | 4.3  | 0.3     | <0.001*                  | <0.001**                      |
| 2  | Challenges related to Medical Education Curricula and programs      | 4.1  | 0.2     |                          |                               |
| 3  | Challenges related to shortage of qualified Faculty members        | 4.4  | 0.1     |                          |                               |
| 4  | Challenges related to students' needs or/and problems               | 3.8  | 0.1     |                          |                               |
| 5  | Challenges related to the advancement in information technology    | 3.6  | 0.1     |                          |                               |

* Significant P ≤ 0.05

** Significant P ≤ 0.05
Table 4 and 5 illustrated Faculty staff members’ perception towards the Suggested strategies for implanting change in medical education. Table 4 illustrated the descriptive data of Faculty’s perception for the twenty strategies represented various suggested strategies for implementing change in medical education. The data was represented in term of mean and standards deviation. For the purpose of comparing data and discussing various strategies, the twenty statements were assembled into three themes that represent the main categories of change strategies. The descriptive data of the main themes were illustrated in Table 3, combined with the results of statistical comparison of different means. Both categories of strategies related to curriculum reform and Faculty development have the same mean (4.2) and that improving learning environment has (4.1) with no significant differences on comparing all categories.

Table 4: Suggested strategies for implanting change in medical education

| No | Item                                                                 | Mean | St.Dev. |
|----|----------------------------------------------------------------------|------|---------|
| 1  | Elimination of non-utility/non-relevant subjects from current curricula. | 4.25 | 1.0     |
| 2  | Modify basic science courses to become more clinically relevant and integrated both horizontally and vertically. | 4.2  | 1.3     |
| 3  | Earlier introduction of clinical subjects.                            | 3.9  | 1.2     |
| 4  | Encourage community-based medical education as opposed to exclusive hospital-based education. | 4.15 | 0.9     |
| 5  | Promote more student centred teaching strategies.                     | 4.4  | 0.9     |
| 6  | Promote critical thinking and life-long self-learning skills, with acquisition of appropriate and relevant values and attitudes. | 4.7  | 0.7     |
| 7  | Introduction of new courses related to patient safety, professionalism, medical ethics and emergency medicine. | 4.45 | 0.8     |
| 8  | Introduction of elective courses both in medical and non-medical fields. | 3.7  | 1.1     |
| 9  | Faculty development to fulfil their roles as Information providers.   | 3.4  | 1.3     |
| 10 | Faculty development to fulfil their roles as Role model.              | 4.6  | 0.8     |
| 11 | Faculty development to fulfil their roles as Facilitator.             | 4.55 | 0.8     |
| 12 | Faculty development to fulfil their roles as Students’ Assessor.      | 4.5  | 0.9     |
Faculty development to fulfil their roles as Curricular Evaluator.  

Faculty development to fulfil their roles as Curricular Planner.  

Faculty development to fulfil their roles as Course Organizer.  

Faculty development to fulfil their roles as Resource Material Creator.  

Effective use of available resources with the emphasis on integrating technology in teaching.  

Providing easy and comfortable access to various information communication technology tools for both Faculty members and students  

Establishing learning centres which equipped with all required technology to facilitate students’ learning.  

Establishment of internal quality assurance system and start the process of academic accreditation.  

| No | Item                                                                 | Mean | St.Dev. | P Value* (One Way ANOVA) |
|----|----------------------------------------------------------------------|------|---------|--------------------------|
| 1  | Strategies related to curriculum reform                             | 4.2  | 0.3     |                          |
| 2  | Strategies related to Faculty development                           | 4.2  | 0.4     | 0.468                    |
| 3  | Strategies related to improving learning environment                | 4.1  | 0.0     |                          |

*Significant P ≤ 0.05

Table 5: comparing themes related to strategies for implanting change in medical education

Table 6 illustrates the use of grounded theory for analyzing qualitative data of the current study. Codes were elected from interviews’ transcripts and all were listed in the right column of Table 6. Codes are arranged and aligned in different subcategories in the middle column. Finally according to subcategories, four core categories were emerged which represent measures or strategies used in implementing change in different medical schools in Saudi Arabia and also some obstacles which facing change process. The three categories which represent change strategies are Organizational measure, Building capacity and Curriculum reform.
Table 6: The initial concepts that emerged from the analysis of interviews

| Emergent Core category         | Subcategory                  | Codes                                                                 |
|--------------------------------|------------------------------|----------------------------------------------------------------------|
| Organizational measure        | Changing structure           | Establishing Medical Education Department                             |
|                                |                              | Establishing Quality Unit                                            |
|                                |                              | Establishing Clinical Skill Centre                                   |
| Leadership/Management         | Vision                       |                                                                      |
|                                | Inspiration                  |                                                                      |
|                                | Ownership                    |                                                                      |
|                                | Engagement                   |                                                                      |
|                                | Encouraging Team work        |                                                                      |
|                                | Administration support       |                                                                      |
|                                | Using Power/Politics         |                                                                      |
| Planning for change           | SWOT analysis                |                                                                      |
|                                | Environmental analysis       |                                                                      |
|                                | Strategic plan               |                                                                      |
| Curriculum reform             | New Teaching Strategy        | Problem Based Learning                                               |
|                                |                              | Student Directed Learning                                            |
|                                |                              | Student prepared presentation                                       |
|                                |                              | Simulation                                                           |
| Introducing new courses       | Introducing Special Study module |                                                                   |
|                                | Introducing Patient Safety module |                                                                       |
|                                | Introducing Emergency module |                                                                     |
|                                | Shift toward System Based modules |                                                                  |
| Improving Assessment          | Test Blueprint               |                                                                      |
|                                | Electronic Assessment        |                                                                      |
|                                | New Assessment methods       |                                                                      |
|                                | Work Based Assessment        |                                                                      |
| Building capacity             | Staff Development            | Conducting Medical Education Workshops                               |
|                                |                              | Developing Master in Medical Education                               |
| Benefit from Local and        | Consultation                 |                                                                      |
| international experiences     |                              | Collaboration with other colleges                                   |
| Improving Learning Environment| Establishing Clinical Skill Centre |                                                                 |
|                                | Saudi Digital Library        |                                                                      |
|                                | Smart classrooms             |                                                                      |
|                                | Student support Unit         |                                                                      |
|                                | Learning Management System   |                                                                      |
| Changing culture              | Accreditation                |                                                                      |
|                                | Establishing Quality unit    |                                                                      |
Obstacles facing change process  | Resource (Human and physical)  | Shortage of qualified faculty staff member  
| Lack of resources(Hospital, Clinical skill center)  
| Negative reaction toward change  | Faculty staff member resistance  
| Lack of support from higher administration  
| Stakeholders’ perception of non-significant effects of change on outcomes  

Discussion

This cross sectional study was conducted to evaluate medical education change in Saudi Arabia from Faculty members’ point of view. Data collection method was mixed using questionnaire and semi-structured interview. Grounded theory was used to analyze interview qualitative data. Faculty staff members from medical and dentistry schools participated in the study; they have medical education background and almost all of them had a PhD from different medical and dentistry specialties. An emphasis was done on the challenges facing medical education in Saudi Arabia and the possible strategies for change.

According to the results of this study, challenges are categorized into five groups: Challenges related to stakeholders’ needs, Challenges related to Medical Education Curricula and programs, Challenges related to shortage of qualified Faculty members, and Challenges related to the advancement in Information Technology. All the means of rating of these challenges were above 3.5 in a scale out of five, which mean that all of them should be considered and need to be dealt with during the change process. The highest rate was for the challenges related to shortage of qualified Faculty members.

Telmesani, 2011 mentioned that, one of the challenge that faces medical education in Saudi Arabia is to supply the recently developed medical schools with enough varieties of competent staff. The Gulf Cooperative Council countries Committee of Deans of Medical schools suggested that the ideal staff-to-student ratio is 1:7. Unfortunately, a considerable number of the already working colleges are confronted with lack in the number of Faculty members, even with a staff-to-student ratio far away from what is ideal. The problem is complicated by an unsatisfactory Faculty compensation scale as matched up with other international universities and private health care centres, a similar circumstance to Malaysia (Lim, 2008).

Many authors wrote about the shift in public attitude as secondary stakeholders, (MacLellan, 1998, Jadad, 1999, Zoeller, 1999, Bloom, 1999, Larkin, 1999, Dennis, 2014, Kitching, 2015 and Shi, 2016). They claimed that the challenges due to the shift in the public attitude are mainly due to two main reasons. First, the great expansion, easy accessibility and availability of medical information. These has supplied interested clients/patients the access to study and search for conditions, symptoms, management and even ask for another opinion. The second reason is mainly based on the new era of accountability and assessment and which has a tremendous effects on all segments of community, including health care services. This is a promising growth, especially if it is associated with enhanced data flow to guide decision making at all levels, involving that of clients/patient.

Regarding the challenges that emerged due to the need for curriculum reform, in the early twentieth first century; Al-Gindan, 2000, mentioned that, there is a need for reform of the current medical curricula in Saudi Arabia. This reform is mainly in the form of eliminating non-relevant information, modification of basic sciences courses to be more clinically relevant, early introduction of clinical experience, introduction of community based medical
education besides the traditional hospital based one, promote critical thinking and encourage lifelong and finally effective use of available resources. Faculty members who participated in this study also valued the need for curriculum reform with the emphasis on: learners’ need to demonstrate competencies, the shift from content based-to outcomes-based curricula, making the medical education curriculum more student-centred than teacher-centred and making the medical education curriculum more integrated both horizontally and vertically and problem based.

Regarding strategies measures for change implementation in medical education in Saudi Arabia, according to the results of current study, they include: Curriculum reform, Faculty development, improving the learning environment. These strategies should be done combined with organizational measures which facilitate the change process and overcome obstacles against change.

Enarson & Burg, 1992 highlighted the need for training students on critical thinking, problem-solving and reforming curriculum with the emphasis on more integration between basic and clinical sciences. Introduction of new courses such as patient safety module led to the improvement in students’ concepts and skills in this area and even they could critically analyze the errors due to system dysfunction and shifted their sense of social responsibility. After training, students increasingly attributed errors to system dysfunction and reported more self-confidence in speaking up about colleagues’ errors. However, due to the hierarchical culture, students still described difficulties communicating with senior doctors (Roh, 2015).

Different areas for Faculty staff members’ development were acknowledged by the participants of the current study. These areas include: Curriculum design and evaluation, Student Assessment, course organization, Facilitation skills and role model skills. Actually, these areas are based on the view reported by Harden, 2000 he mentioned twelve roles for medical teacher in modern medical education. These roles are categorized in six areas: Role model, Information provider, Examiner, Facilitator, Planner and resource developer. Faculty development is essential to help faculty staff member to fulfill these new roles which is far from the conventional role as information giver.

Last but not least the strategy for changing medical education in Saudi Arabia as acknowledged by participants is improving the learning environment. The strategies for improving the learning environment include: Effective use of available resources with the emphasis on integrating technology in teaching, Providing easy and comfortable access to various information communication technology tools and establishing learning centres which equipped with all required technology. Similar to these strategies, Guze, 2015 emphasized the importance of using technology as an infrastructure to enhance learning environment and as a basis to address many of challenges facing medical education. Guze, 2015 highlighted some of the technologies which could aid and support learning environment, such as: computer assisted learning, Personal digital assistants (PDAs) using mobile devices, Digital games and the so called "serious gaming", Simulation like virtual reality and Wearable Technologies.

Finally, some Faculty staff members participating in this study described their experience in changing medical education in Saudi Arabia; one can conclude their description as different medical schools in Saudi Arabia use a variety of strategies for implementing change in medical education. These strategies include curriculum reform and building capacity to cope with challenges, for enhancing change process, there are certain measures at the level of organization should be followed to facilitate the change process. The measures include: changing organizational structure, Leadership and management support for change, proper planning for change and starting the change process as a part of either national or international academic accreditation like what happened in School of Medicine, Stony Brook University (SBU SOM), they utilized a Liaison Committee on Medical Education (LCME) site visit to design a change management process. (Chandran, 2013)
Limitations of the study

There are some limitations in this study; the main limitation is the number and diversity of participants, which is due to time constraints and the lack of a full data base of medical educationists in Saudi Arabia, so the author used a judgmental method for sampling. Also one of the limitations of the study is the lack of full data for comparing change strategies in different medical schools in Saudi Arabia.

Recommendations for further research

More and detailed studies are required for evaluating change in medical education in Saudi Arabia with comparison of different strategies used in different colleges with measuring the effectiveness of each of them. The evaluation should not be limited only to Faculty staff members’ and students’ opinion, but also to cover its tangible effects on Medical education outcomes due to curriculum reform and using new teaching strategies. A cross case pattern comparison study is recommended as national project to compare the effectiveness of different strategies on the change process.

Conclusions and recommendations

Change could be implemented through curriculum reform with the help of qualified Faculty staff members in presence of an enabling learning environment and supportive organizational measures. Almost all Medical Schools in Saudi Arabia utilized a variety of strategies for implementing change in Medical Education. These strategies included curriculum reform and building capacity to cope with challenges. Building capacity was mediated through Faculty development, improving learning environment with the emphasis on using technology, benefit from local and international experiences and changing culture mainly through accreditation and establishing quality unit and medical education department

Take Home Messages

1. Local change in Medical Education should be globally oriented.
2. Change should start by analysing both internal and external environment.
3. Consultation and benefit from local and international experiences should be considered.
4. Build support between like mind people and at the same time not to neglect whom resisting or against change.
5. Combining various strategies are essential for effective change management.

Notes On Contributors

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Bibliography/References

Ahmed AM. (2002) Deficiencies of history taking among medical students. Saudi Medical Journal, 23:991–994.

AlFaris E, Abdulgader A, Alkhenizan A. (2006) Towards evidence-based medical education in Saudi medical schools. Annals of Saudi Medicine, 26:429–432.

Al-Gindan YM, Al-Sulaiman AA, Al-Faraidy A. (2000) Undergraduate curriculum reform in Saudi medical schools. Which direction to go? Saudi Medical Journal, 21:324–326.

Al-Shehri MY, Al-Ghamdi AS. (1999) Is there anything wrong with undergraduate medical education in Saudi Arabia? Saudi Medical Journal, 20:215–218.

Bin Abdulrahman K. (2011) Saudi Arabia does not need an Abraham, Health statistic book for the year of 2006. Riyadh, Saudi Arabia, Ministry of Health.

Bin Abdulrahman, K, Harden, R & Patrício, M. (2012) Medical education in Saudi Arabia: an exciting journey, Med Teach, vol. 34 Suppl 1, pp. S4-5.

Bloom, BS. (1999) Internet availability of prescription pharmaceuticals to the public. Ann Intern Med. 131: 830-833.

Chandran, L, Fleit, HB & Shroyer, AL. (2013) Academic medicine change management: the power of the liaison committee on medical education accreditation process, Acad Med, vol. 88, no. 9, pp. 1225-31.

Dennis, AA, Cleland, JA, Johnston, P, Ker, JS, Lough, M & Rees, CE. (2014) Exploring stakeholders' views of medical education research priorities: a national survey, Med Educ, vol. 48, no. 11, pp. 1078-91.

Elfaki EA. (2004) Undergraduate curriculum reform in Saudi medical schools, Saudi Medical Journal. 21:324–326.
Enarson, C. & Burg, F.D. (1992) An overview of reform initiatives in medical education: 1906 through 1992. Journal of the American Medical Association, 268: 1141-1143.

Guze, PA (2015) Using Technology to Meet the Challenges of Medical Education, Trans Am Clin Climatol Assoc, vol. 126, pp. 260-70.

Harden R.M. and Joy Crosby. (2000) The Good Teacher is more than a Lecturer- twelve roles of good teacher, Medical Teacher, 22: 4.

Jadad, A. (1999) Promoting partnerships: challenges for the internet age. BMJ 319:761- 764.

Khalid BA. (2008) The current status of medical education in the Gulf Cooperation Council countries. Annals of Saudi Medicine, 28:83–88.

Kitching, F, Winbolt, M, MacPhail, A & Ibrahim, JE. (2015) Web-based social media for professional medical education: Perspectives of senior stakeholders in the nursing home sector, Nurse Educ Today, vol. 35, no. 12, pp. 1192-8.

Larkin, M. (1999) US online pharmacies strive for respectability. Lancet, 354: 782.

Light, D.W. (1988) Toward a new sociology of medical education. J. Health Soc. Behav. 29 (December), 307-322.

Lim VK. (2008) Medical education in Malaysia. Medical Teacher, 30:119–123.

Milaat WA, El-Gamal FM. (1994) Factors affecting the use and attitude towards medical resources and educational methods in a Saudi medical school. Annals of Saudi Medicine, 14(3):209–214.

Roh, H, Park, SJ & Kim, T. (2015) Patient safety education to change medical students' attitudes and sense of responsibility, Med Teach, vol. 37, no. 10, pp. 908-14.
Saunders, M., Lewis, P. & Thornhill, A. (2009) Research methods for business students, 5th ed., Harlow, Pearson Education.

Shawky S, Soliman NK. (2001) Going beyond the curriculum to promote medical education and practice in Saudi Arabia. Saudi Medical Journal, 22:477–480.

Shi, H & Lee, KC. (2016) Bolstering the pipeline for primary care: a proposal from stakeholders in medical education, Med Educ Online, vol. 21, p. 32146.

Strauss, A.L, and Corbin, J. (1990, 1998) Basics of Qualitative Research: Techniques and Procedures for developing Grounded Theory, Sage Publications Ltd, London.

Telmesani, A, Zaini, RG & Ghazi, HO. (2011) Medical education in Saudi Arabia: a review of recent developments and future challenges, East Mediterr Health J, vol. 17, no. 8, pp. 703-7.

Zaini RG, Bin Abdulrahman KA, Al-Khotani AA, Al-Hayani AMA, Al-Alwan IA, Jastaniah SD. (2011) Saudi Meds: A competence specification for Saudi medical graduates. Med Teach 33(7):582–584.

Zoeller, J. (1999) Rushing the net. American Druggist, 216 (3):50.

**Appendices**

**Declaration of Interest**

*The author has declared that there are no conflicts of interest.*