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Mapping Skills and Competencies; Providing Access to Knowledge, Tools and Platforms; and Strengthening, Disseminating and Exploiting Success Outcomes for a Skilled Transatlantic eHealth Workforce

Case Study: IT in Healthcare Executive Certificate: Postgraduate Training in Saudi Arabia

King Saud bin Abdulaziz University for Health Sciences, Saudi Arabia

TITLE IT in Healthcare Executive Certificate: Postgraduate Training in Saudi Arabia

AUTHOR

Taghreed Justinia, PhD, Regional Director IT Services, Technology & Health Informatics, King Saud bin Abdulaziz University for Health Sciences, Saudi Arabia

ORGANIZATION

King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) is a recently established university in Saudi Arabia. It was founded in 2005 under the umbrella of the Ministry of National Guard, Health Affairs (M-NGHA). The Health Affairs as a governmental non-profit healthcare organization is comprised of two medical cities, one in Riyadh and the other in Jeddah. There are also hospitals in Dammam, Al Ahsa and Al Madinah, and over 100 primary healthcare centres across the Kingdom of Saudi Arabia. KSAU-HS is closely affiliated with the Health Affairs' hospitals as the academic arm of the organization. The KSAU-HS university campuses and accommodations are physically located on the same grounds as the hospitals.

The university has three campuses in three different cities: Riyadh, Jeddah and Al Ahsa. The Riyadh campus is the largest site and hosts seven colleges: Medicine, Nursing, Dentistry, Pharmacology, Public Health & Health Informatics, Science & Allied Health Professions and Applied Medical Sciences. Its sister site in Jeddah has four colleges: Medicine, Nursing, Science & Allied Health Professions and Applied Medical Sciences. The Al Ahsa site is the smallest campus and hosts three colleges: Medicine, Science & Allied Health Professions and Applied Medical Sciences. Being the academic leg of the M-NGHA operation, the KSAU-HS provides and supports courses and opportunities for continuous medical education and oversees the residency training programs under the Deanship of Postgraduate Education and Academic Affairs.

The M-NGHA sites also encompass the King Abdullah International Medical Research Centre. All three KSAU-HS university sites are connected with each other and with the M-NGHA hospitals via high-speed data carrying complex wide area network (WAN) communications infrastructure. As a university, KSAU-HS is, by all means, complex in its structure and purpose.

BACKGROUND

Trends in Higher Education in Saudi Arabia
There is evident trending growth in higher education in Saudi Arabia. In 2003, there were only eight public universities and seven private colleges in Saudi Arabia with a total enrolment of 550,000 students per year. While in 2014, the Kingdom witnessed significant reform in the provision of higher education with 25 public universities, 30 private universities and colleges totalling an enrolment of 1,200,000 students per year. At least 30 of those educational institutes offer degrees in healthcare.

Spending on Education and Healthcare in Saudi Arabia
According to the Fiscal Budget for 2017, Saudi Arabia's highest expenditure allocation is on Education & Training with an allocated SAR 200 Billion ($53.3 Billion), which is even higher than Health and Social Development with a budget of SAR 120 Billion ($32 Billion). Compared with spending on Military of SAR 191 Billion ($51 Billion) and Security & Regional Administration of SAR 97 Billion ($25 Billion), the expenditures on education are notably high [1].

STATUS/CURRENT DEVELOPMENTS
Despite the wealth of literature about Health Informatics (HI) education and the issues involved [2-6], there is very little discussion on the role of HI practice and tools in higher education in the health sciences

and medical fields. This applies to HI education in Saudi Arabia as well, and more specifically within our university.

With the knowledge of an existing gap in HI education, our university already provides a Masters HI program that is taught over two years. Upon discussing training and educational opportunities with many healthcare professionals, we have come to realize that not all professionals have the time or resources to dedicate two years of full time study to adequately learn about HI. We have therefore proposed the Information Technology (IT) in Healthcare Executive Certificate training program as a solution to help those interested bridge their knowledge gap in a professional training setting. The course not only proposes to provide quality training in an efficient manner, but is also intended to run mainly over the summer months, and was designed not to interfere with the local Islamic holidays and religious periods of Ramadan and Hajj.

ACTIVITIES/MEASURES
IT in Healthcare Executive Certificate
This postgraduate certificate training program is tailored to healthcare professionals with guided HI training. With the time constraints of the healthcare professional in mind, the program is taught over four separate courses running 40 hours each. The total for the four courses is 160 hours. Each course is taught over one week in a full time intensive manner, so the applicant is only required to dedicate four full time weeks for their education, and these are spread out over five months to allow time for reflection and course projects, which are done in between the courses.

This program is distinguishable from all other such programs currently available because of its ability to address the health IT education and training needs of a broad range of employees found in the kind of companies and institutions who are constituents of healthcare organizations worldwide. It is intended to prepare not only those responsible for the implementation of electronic records and other types of IT, but also those charged with integrating these technologies across previously disparate parts of health systems. The certificate is directed at physicians, nurses, administrators, as well as IT professionals. Often, a team comprised of all stakeholders participate and use the program to derive an IT-business strategy.

It is also designed to meet the needs of those who will be the major users of these technologies (both clinical and non-clinical), regardless of their pre-course knowledge and experience in using electronic tools. On the one hand, the courses will meet the needs of those seeking more of a high level, strategic education concerning how the use of various IT that may drive the rapidly evolving vision of an organization, positioning itself to compete successfully in a world dominated by value-based purchasing and accountable care. On the other hand, it will provide nuts and bolts training for those in back offices, as well as on the front lines of patient care and healthcare operations, where the rubber truly meets the road in terms of demonstrating the value of these technologies to overall clinical and financial performance, as well as the changing regulatory and insurance dynamics.

<u>**Certificate includes the following 4 courses:**</u>

1. Healthcare IT: Evolution, Trends, & Management Practices

This course provides comprehensive background knowledge about the development of the healthcare IT industry from different stakeholder (e.g., physicians, nurses, administrators, patients, insurance providers, government, IT) perspectives. New and emerging IT service provider roles and management practices, as well as eHealth system transformations due to environmental, business, legal/regulatory and insurance and technological changes, is the course focus.

2. Front-Office Processes & Applications: External Value Chain (e.g., Partner-Facing and Patient-Facing Clinical Services, Marketing/Sales, Delivery)

As web-based technologies and public access to them have evolved, the United States (US) and other developed countries have begun to focus more on the primary healthcare consumer: the patient. Although several thought leaders have been promoting healthcare that is more consumer-driven for several years, patient-centered goals are now a part of many national programs—including the Health Information Technology for Economic and Clinical Health (HITECH) Act in the U.S.

The primary focus of this course is on the selection and implementation of software applications to support in-patient and outpatient clinical care, point-of-care decision-making by providers, as well as increasing patient engagement in these decisions. General knowledge about individual, group and organizational adoption issues will be applied to the analysis of case studies for specific clinical contexts and health system settings. Special attention will be given to what has been one of the most problematic enterprise system module adoptions: Computerized Physician Order Entry (CPOE) systems with Decision Support Systems (DSS) support. We will then address the opportunities and challenges associated with the usage of current web-based technologies designed for direct interaction with patients, who may be at different levels of health and computer literacy.

3. Research & Development Processes and Applications (e.g., New Product/Service Innovation, Partner Collaboration, Real-Time Data)

Today, we are witnessing a convergence of new IT capabilities and modern medicine knowledge and practices. Existing healthcare system structures and stakeholders however, can hinder innovations in products and services. In the US for example, the adoption of telemedicine applications for diagnosis, monitoring and disease management has been constrained by state licensing of physicians and the lack of public and private insurance coverage for delivering telehealth services to patients. The course materials will provide case examples of successful initiatives that have leveraged newer technologies using wired or wireless communications, as well as insights into the facilitators and inhibitors for a specific type of initiative. New frontiers in artificial intelligence (AI) as well as new mechanisms for forging closer links with medical scientists, healthcare providers and patient profiles will also be explored.

4. Patient-Centric Medicine

Advances in health technologies and data management are facilitating new diagnostic and treatment options. Providers can now leverage vast amounts of patient data gathered from a variety of sources to determine the clinical value of specific treatments and how to make them better. Payers, providers and pharmacy retailers alike are realizing that new business models can be used to attractive consumers/patients, employers/employees, and fulfil the incentives of government motivators. Remote patient monitoring, point of care diagnostics and telemedicine allow for patient's to receive feedback on their own health trends, while providing daily status feeds of key biometrics to centralized clinical centers.

Topics include: Medication and Therapeutic Regimen Adherence, mHealth and Telehealth Concepts, Employee Wellness Programs, Gamification Techniques, Patient-Centered Medicine and Pharmaceutical Brands, Patient-Centered Medicine in Clinical Trials, Patient-Centered Medicine for Payers and Providers and Patient-Centered Medicine Technology Architecture.

CHANGES

The three most obvious changes that were brought about from the IT in Healthcare Executive Certificate when compared with the Masters HI program currently provided by our university are:

1. The time required to complete the certificate program is significantly less, while the main HI educational themes for the healthcare professional are fully achieved.
2. The certificate program is a paid program that can be privately sought or sponsored, as opposed to our Masters HI program, which is provided free of charge to Saudi Nationals.
3. The faculty and curriculum are provided by an external IT training company; the Global Institute for IT Management (GIIM), which frees our university from manpower commitments and curriculum development for what we would consider a short course.

RESULTS

The main goal from offering this course is to provide an opportunity for healthcare professionals in our organization and in Saudi Arabia to receive adequate training in HI within the confines of the regimented and time-constrained roles of routine jobs. Providing this opportunity, which is flexible while still offering a fulfilling training experience, will provide an efficient "fast-track" approach to adequately training the local cadre without sacrificing the quality of teaching. The expected rapid turnaround is important in keeping up with the rapid pace of development across all sectors in Saudi Arabia in realizing the goals of the Kingdom's 2030 Vision.

OUTLOOK/LESSONS LEARNT

The next step in actualizing change is to see how our trainees fair in the market and how their training has helped them in their daily roles and in their career development.

References

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Case Study Checklists

Checklist of eHealth topics (competencies)

Role of "Peopleware":

The role of "Peopleware" is evident from a needs assessment perspective when initially proposing this course. The enlightened awareness of healthcare workers at the medical arm of the organization is clear. With the recent rollout of an electronic health record (EHR) system "BestCare", most healthcare workers in the organization were directly impacted by the introduction of a new system. Some experienced a positive impact, while others may have had difficulties, which made them more sensitive to the particulars of change management and the adoption of new IT technologies in healthcare.

Role of inter-professional approaches
Direct training at the medical arm of the organization is routinely carried out. For example, the BestCare system was rolled out via several rounds of inter-professional "train the trainer" type activities, with the aim of training champions within all specialties who would then be capable of carrying out mono-professional training to their peers.

For the IT in Healthcare Executive Certificate, the aim was to provide independently trained faculty without the need to locally train the university faculty, who would then train the wider workforce. The targeted workforce was external to the organization (from the region of Saudi Arabia), and not the organization's staff.

Role of healthcare data sciences:
Not applicable to the introduction of the course, however these topics are incorporated as part of the teaching within the course.

Fusion of medical technology & informatics
Not applicable to the introduction of the course, however these topics are incorporated as part of the teaching within the course.

Role of process and workflow management:
A detailed Memo of Understanding (MoU) was agreed upon between the university and the company that provided the faculty and training materials. This was to clarify all logistics/requirements, management of processes and workflow management for the preparations and execution of the course.

Role of ethics, legal and data protection issues:
A detailed MoU was agreed upon between the university and the company that provided the faculty and training materials. This was to cover ethical issues and to ensure the protection of all legal and data protection rights for all parties involved.

Role of learning and teaching:
All courses were agreed to be taught in face-to-face, however the course is flexible enough to be offered as a blended or online course in the future.

Role of management related topics in health informatics and IT:
Not applicable to the introduction of the course, however these topics are incorporated as part of the teaching within the course.

Role of technology:
Not applicable to the introduction of the course, however these topics are incorporated as part of the teaching within the course.

Role of consumers and populations: consumer health informatics, public health informatics
Not applicable to the introduction of the course, however these topics are incorporated as part of the teaching within the course.

Role of Research: information management in research, data analytics
Not applicable to the introduction of the course, however these topics are incorporated as part of the teaching within the course.

Role of interoperability: systems integration, IT standards, terminologies and classifications
Not applicable to the introduction of the course, however these topics are incorporated as part of the teaching within the course.

Checklist of eHealth topics (gaps and deficiencies)

Teaching the teachers: Are there any activities in your organisation to teach health IT/eHealth to teachers in healthcare?
There are monthly and/or quarterly seminars available to all faculty in the university as well as all healthcare workers in the hospital on various subjects related to IT/eHealth.

Supporting participatory design and acceptance testing/research: Are there any educational activities to teach or practice participatory design? Are there any activities including research in user acceptance testing and satisfaction measurement?
N/A

Integrating eHealth/health informatics into traditional curricula: Are there any activities to include eHealth/health informatics into traditional curricula of physicians, nurses and other health professionals with direct patient care?
All students of the Masters HI course are extensively taught eHealth/ HI topics, while all undergraduates at the university are required to take the course *Computer Science and Health Informatics*. The following course is provided as a required subject to all undergraduate students of the university: *Computer Science and Health Informatics*. Additionally, under the College of Nursing, the course *Nursing Management and Health Informatics* is also provided as a required subject to all undergraduate students.

Motivating clinicians and managers: Are there any incentives and opportunities for clinicians and healthcare managers to acquire and update digital eHealth/health informatics skills and knowledge?
Continuous Medical Education (CME) credits are offered to those participating in this certificate program and usually any formal workshops or conferences related to eHealth/ HI training.

As a note, King Saud bin Abdulaziz University for Health Sciences endorses and hosts the conferences and workshops organized by the Saudi Association for Health Informatics (SAHI). Normally all activities under SAHI would provide CME credits as incentives. See www.sahi.org.sa

Note: SAHI is a scientific association under the direct supervision of King Saud bin Abdulaziz University for Health Sciences, and conducts its public activities to develop theoretical and application knowledge in order to provide scientific and applicable studies, including consultation whether for private or public. It is

a non-profit organization, which was founded in 2006. SAHI helps to develop the scientific knowledge in the field of health information, scientific and vocational performance for association members, and provides an umbrella for those working in the scientific field.

Engaging women: Are there any activities to attract female students in eHealth/health informatics or employ female health IT staff?
As a country that provides equal pay to female and male employees, there is not too much focus on specifically attracting female students. Female students are offered equal opportunity to join the HI master's program, the IT in Healthcare Executive Certificate and usually any other training activities.

Adjusting job descriptions and enable continuing education: Are there any activities to adjust job descriptions, e.g., for clinicians, that include health informatics competencies (also proper use of health IT/eHealth systems) and are there activities to support staff updating and upgrading their health IT related skills and knowledge? This topic is mainly related to provider organisations and IT vendors.
N/A

Updating teaching and learning material:
The hospitals and medical cities are Joint Commission International (JCI) accredited and the university is currently seeking National Commission for Academic Accreditation and Assessment (NCAAA) accreditation, which requires that materials are up-to-date and of high quality.

Availability of courses including electronic courses:
The Saudi Arabian Ministry of Health formally recognizes health informatics as a speciality and offers clear criteria for ranking and job classification based on formally acquired health informatics education.

In our university in particular, we offer a Masters in HI program that is regularly revised and updated. We also offer an undergraduate degree in health information system (HIS)/health information management (HIM) that is currently being revised, and a newly structured course is being rolled out.

Lastly, the IT in Healthcare Executive Certificate is a new initiative aimed at providing continuing education with CME hours that are formally recognized by all health bodies and the Saudi Arabian MoH.

Informal caregivers: Are there any educational activities to teach health IT usage to informal caregivers, e.g. for assistive technologies?
N/A

Shortage of health informatics specialists: Are there any programmes to attract health informatics specialists?
N/A

eHealth Budget: Does your organization, area or region have a dedicated budget set aside for eHealth/health informatics training, education or workforce development initiatives?
I am not privy to that type of information.

eHealth Specialty Areas: Does your organization address any of these speciality settings/areas of training or outreach for eHealth education or workforce development: ambulatory care, social medicine, geriatric/ageing medicine, rehabilitation?
N/A