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Architectural Practicing in the Era of Globalization (Saudi Market as a Case Study)

Ahmed Mohamed Shehata¹, Ibraheem N. A. Al-Bukhari²

¹*Professor of Urban & Environmental Design, Islamic Architecture Department, College of Engineering & Islamic Architecture, Umm Al-Qura University*

²*Islamic Architecture Department, College of Engineering & Islamic Architecture, Umm Al-Qura University*

Abstract

In the era of free trade and open markets, international consultant firms started to take over the local markets. Local graduates are required to acquire certain skills and knowledge to compete in their local markets with the international graduates. Local architectural teaching institutes are required to equip their graduates with the needed skills and knowledge. Gulf construction and design market is one of the biggest markets in the world. Saudi Arabia, with its 646.44 billion Dollar GDB, is considered the biggest market in the Gulf area. The Saudi vision of 2030 concentrates on economical sustainability and developing citizens. In this regard, this research investigates the competitiveness of the Saudi educational outputs in the era of globalization and open markets. To achieve its objectives, the research analyzes the different scopes of practicing architecture especially in the design consultation field. International design firms working in the GCC counties and their required skills for positions were presented and analyzed. Moreover, educational architectural curricula were investigated and tested against the required skills by international firms. The paper concluded with suggestions regarding architectural programs and their curricula that will enable Saudi graduates to fulfill the international consultation market required qualifications and skills.

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Keywords

Saudi 2030 vision; Educational outputs; Architectural practice; competitiveness

1. Introduction

Human capital is a vital factor in the success of any substantial development. One of the most significant assets of any society is its lively and vibrant youth. While many developed societies are concerned with aging populations, more than half of the developing societies' population is below the age of 25 years. It is important for developing countries to take advantage of this demographic dividend by harnessing youth's energy and providing them with the required skills.

In a world without borders, achieving the desired rate of economic growth require an environment that attracts the necessary skills and capabilities both from within the local society and beyond national borders. This means building, attracting and retaining the finest local minds and provide them with all they need. One of the Gulf state vision aspects is make use of the local as well as the foreign working force to contribute to economic development

and attract additional foreign investment. The 2030 Saudi vision handled this issue and put objectives and strategies to ensure sustainable economy that works for Saudi citizens.

1.1. Saudi Construction Market Profile

The construction industry is showing strong growth rates through the last few years. Charts in Figures 1 to 4 show some of the most important indicators about the industry potential and market size of construction. It should be noted that the easily accessible building materials, such as cement, doors, and windows in the domestic market, are positive indicators for the construction industry. The growth in the construction industry has led to a wide array of job opportunities for both domestic and foreign job seekers. Despite the anticipated budget deficit of USD 87 billion in 2016, construction projects are expected to be completed without any hindrances. The residential sector is also expected to grow significantly, as the rapid population growth

(population is expected to reach ~37 million over the next 10 years) in the Kingdom has stemmed a need for ~3 million housing units by 2025 (Source Global Research, 2017; Turner & Townsend, 2017).

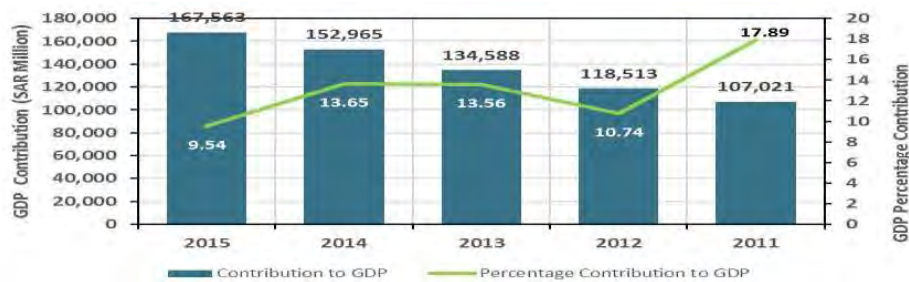


Figure 1. Construction Sector Contribution to GDP (2011–2015) ("Saudi Arabian Monetary Agency", 2015).

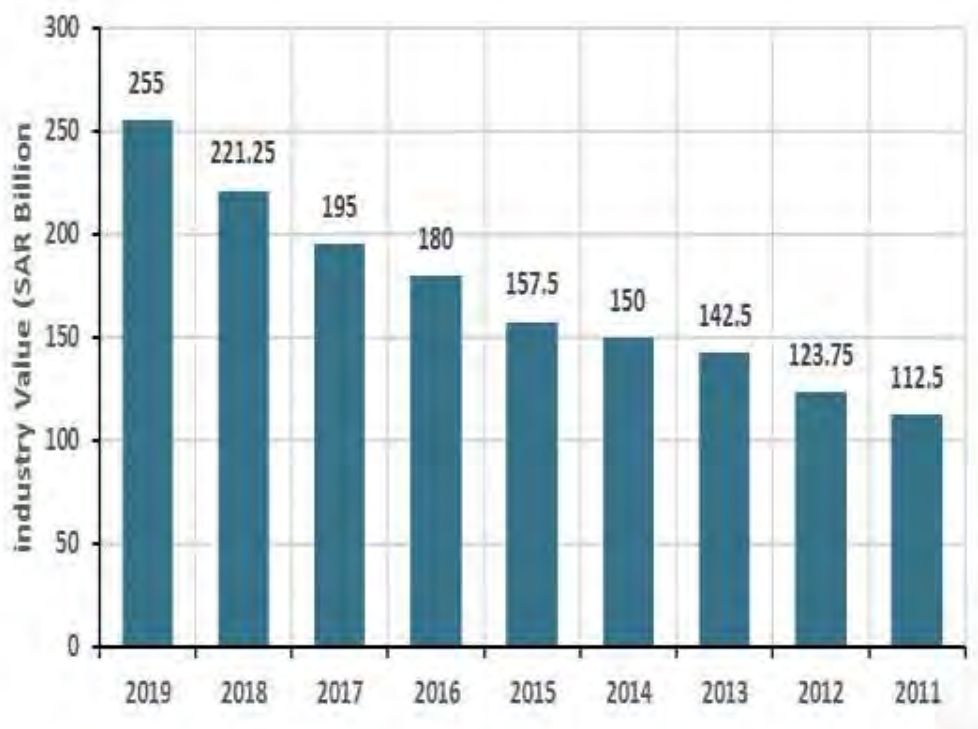


Figure 2. Construction Sector Value in KSA (2011–2019F)



Figure 3. Building Construction Contracts Awarded 2013–2015 (USD Million) ("Jeddah Chamber", 2016).



Figure 4. Sector-wise Construction Budget Distribution (2015) ("Jeddah Chamber", 2016).

2. Architecture Practicing in GCC

Architecture record annual statistics of the top twenty firms in the world showed that 65% of the twenty top firms get more than 45% of their revenue out of practicing architecture design while 45% of them come from architectural engineering consultations. Three of these firms get more than 40% of their revenue from international practicing. Results of the top twenty firms' revenues distribution are presented in figures 5, 6 and 7 (2016 Top 300 Architecture Firms, 2016).

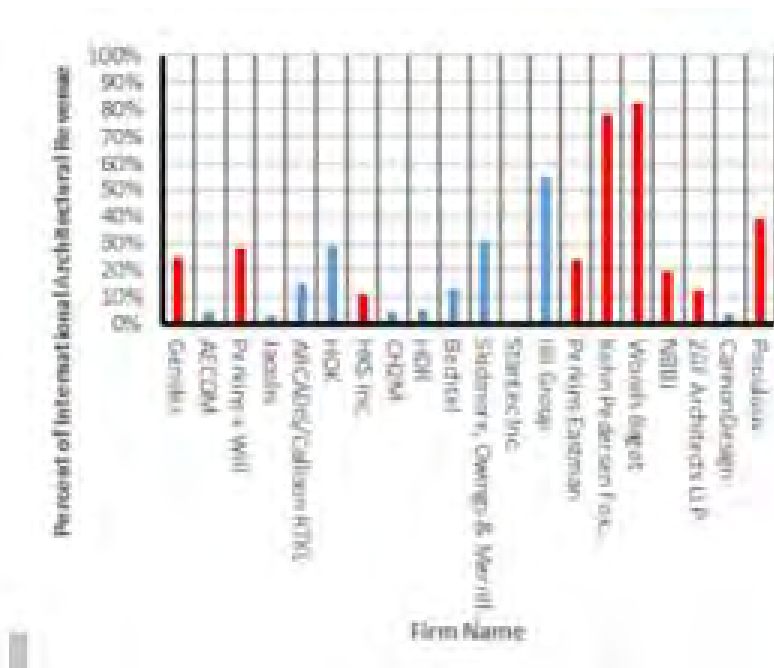


Figure 5. Percent of International Revenue of Architectural Firms

Required Skills and Knowledge:

Surveying job postings of the top firms that gets their revenue from practicing architecture shows that the required skills can vary based on the job but, in general, key skills can be classified into the following categories: (Architect - Gulf Consult, 2017).

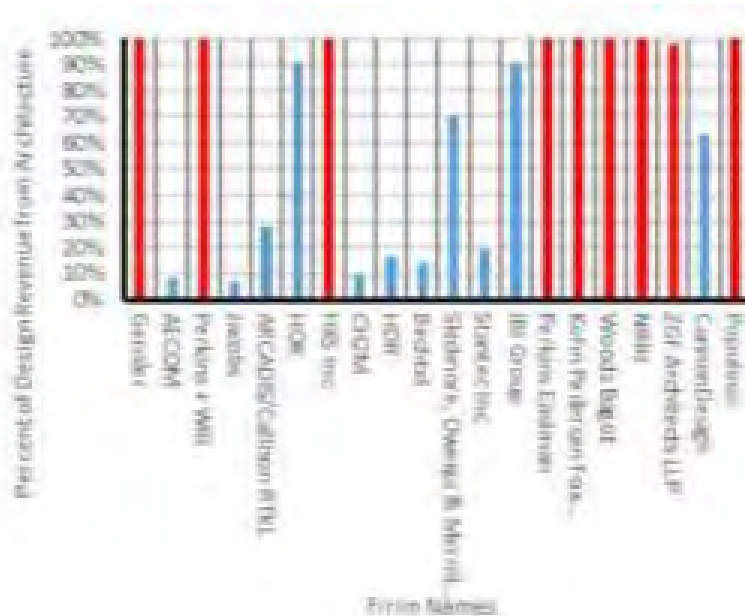


Figure 6. Percent of Design Revenue from Architecture

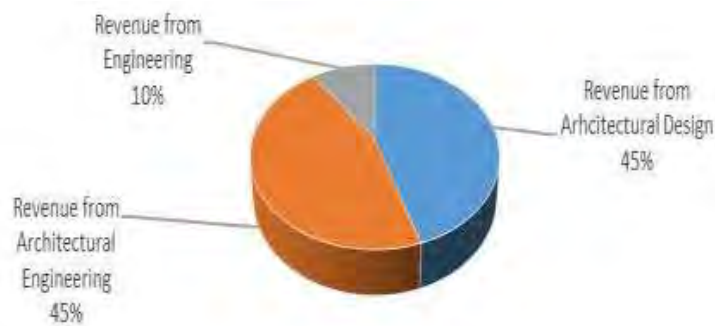


Figure 7. Top Twenty Firms in 2016 Survey Revenue Distribution

Codes Knowledge:

Knowledge of codes and ability to interpret them and ensure designs meet codes is an essential aspect of any architecture job (Quirck, 2014).

- Architectural Codes
- Leadership in Energy & Environmental Design (LEED)
- Building Codes
- Zoning Codes

Technical Design Skills:

Using computer programs and processes are the key skills for architectural design:

· Technical Vision	· AutoCAD	· Revit	· Drafting
· Model Making	· Design Concepts	· Design to Delivery	· Plans
· Industrial Design	· Sustainable Design	· Specifications	· Rendering
· Computer Aided Design (CAD)	· Computer Processing		

Building and Construction Skills

Awareness of the requirement and process of different kinds of buildings and construction, their settings and its

surroundings require the following skills:

· Building Construction	· Building Systems	· Construction Administration	· Construction Documents
· Industrial Design	· Installation	· New Construction	· Preservation
· Retail	· Rehabilitation	· Renovation	· Residential

Project Management Skills:

The following skills need to be pursued and developed through studying and practicing on real projects:

· Analysis	· Conceptualization	· Budgeting	· Coordination
· Client Relations	· Collaboration	· Communication	· Legal
· Design to Delivery	· Zoning Codes	· Finance	· Management
· Problem Solving	· Project Management	· Scheduling	· Estimating
· Specifications	· Building Codes	· Architectural Codes	
· Solving Complex Problems	· Seeing Big Picture Results	· Leadership in Energy & Environmental Design (LEED)	

Moreover, job sites like LinkedIn statics show that job postings for architects are almost more than half of the engineering job postings (shown in figure 8). It also shows that knowledge of computer software like AutoCAD, Sketch UP, Revit and Photoshop are essential skills specially for fresh graduates. Figure 9 shows the distribution of the key skills where architectural design comes first then computer software ("Architect - Gulf Consultant", 2017).

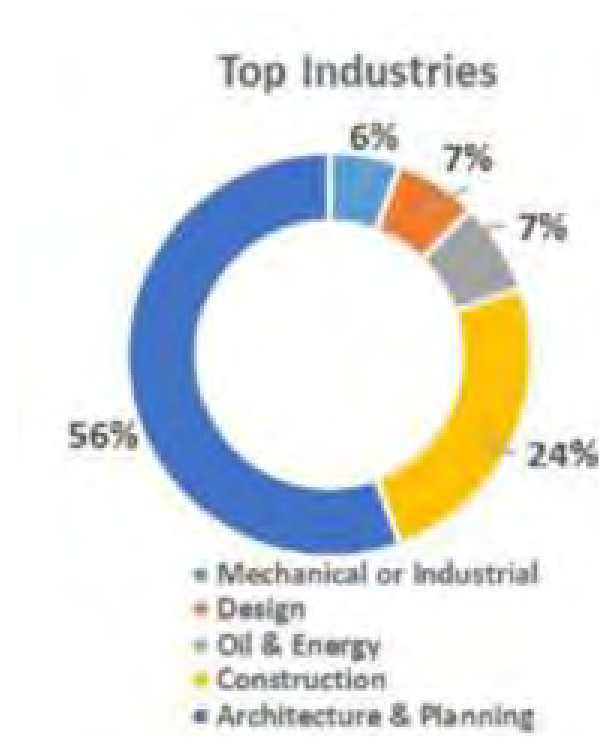


Figure 8. Insights about Architect - Top Gulf Consultant members on LinkedIn ("Architect — Gulf Consultant", 2017).

Required experience and skills vary based on the job responsibilities and description. Alison Doyle in her article about most wanted architectural skills argued that accreditation is more important to architects than being licensed. Moreover, she claimed that LEED accreditation is the most wanted skill for different firms. Figures 10 and 11 illustrates the most wanted skills as per statistics of Job Seeking site (Doyle, 2017).

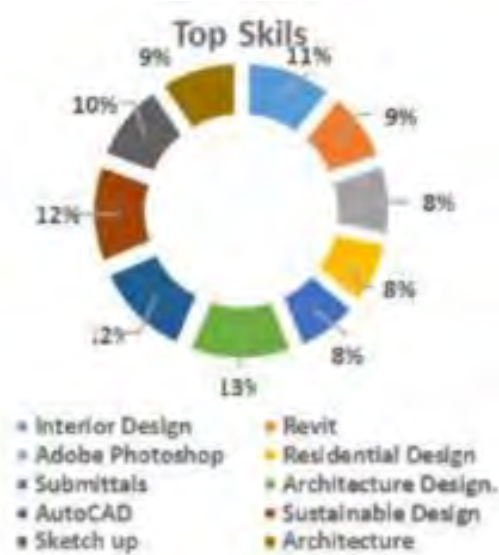


Figure 9. Top skills –Required by Architecture Consultant members on LinkedIn

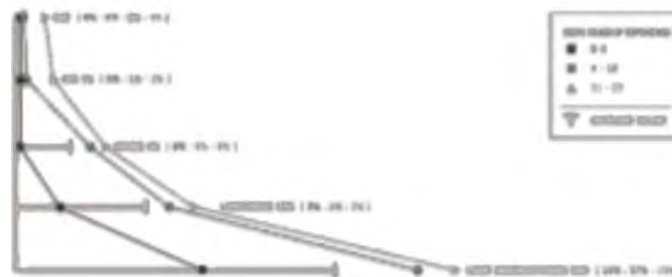


Figure 10. Architecture licensure versus Accreditation.

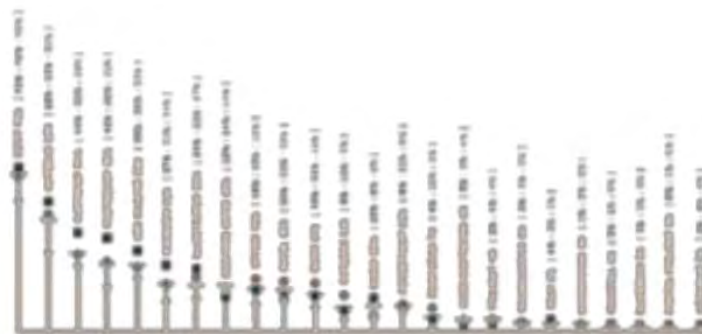


Figure 11. Key skills rated according to job postings.

3. The Saudi Vision of 2030

The second axe of the 2030 Saudi vision considers achieving a thriving economy. The objectives that formulate this axe is consolidated in the learning for working. It stated that this would be achieved through investing in education and training the young men and women to be equipped for the jobs of the future. It is the aim that Saudi youth, wherever they live, enjoy higher quality, multi-faceted education. Efforts will be doubled to ensure that the outcomes of the Saudi education system are in line with market needs. Launching the National Labor Gateway (TAQAT) is part of these efforts. Proposed sector councils will precisely determine the skills and knowledge required by each socioeconomic sector. Expanding in vocational training will drive forward economic development.

Scholarship opportunities will be steered towards prestigious international universities and will be awarded in the fields that serve the national priorities. Innovation in advanced technologies and entrepreneurship will be in the focus of education (Vision 2030, 2017).

Saudi Architectural Educational Programs:

The architecture schools within the Kingdom were surveyed. Table (1) summarizes the results of curriculum of the surveyed architectural educational institutes in Saudi Arabia. The survey shows that there are eighteen universities that teach architecture in the kingdom of Saudi Arabia. While 28% out of these eighteen are private universities, 22% of them are graduating only female architects. Basic results showed that the study plan of these universities varies widely in their curriculum areas, position statements, program objectives and contents. Table 1 also shows big differences in the number of elective courses and their topics. While Hail and Umm Al-Qura universities do not have any elective courses, Taibah university has eight elective courses and the average of the rest is three courses. The most critical remark was the big difference in number of design courses and this, of course, affects the complexity of their projects. King Faisal, Prince Sultan and Taibah offer only three courses in addition to the graduation project. While King Fahd university students attend 10 design studios. Results also show that only half of the surveyed schools give a deep and detailed building science courses (Joseph, 2010).

Table 1. Contents of Curriculums of Surveyed Universities:

		King Saud University / Architecture and Building Science	Prince Sultan University	King Faisal University	King Abdul-Aziz University	Umm Al-Qura University	Effat University	Dar Al-Hekma College	Minerals	Taibah University	Jazan University	University of Hail	Al Baha University	Nahrain University
basics	Visual Communication	*	*	*	*	*	*	*		*	*	*	*	*
	Creative Design			*	*	*	*	*				*	*	*
	Architecture Presentation I - descriptive geometry		*	*	*			*	*	*		*	*	*
	Architecture Presentation II - perspective	*	*	*	*		*	*	*	*	*	*	*	*
	Freehand Drawing	*		*	*	*	*						*	*
history	Architecture, Culture, and Environment	*		*	*	*	*	*					*	*
	Theory of Architecture	*		*	*	*	*	*		*		*	*	*
	Comparative Architectural Thoughts	*		*	*	*	*					*	*	*
	Comparative Architectural Thoughts II			*	*	*	*	*	*	*	*	*	*	*
	History of Architecture	*	*	*	*	*	*	*	*	*	*	*	*	*
	History of Architecture II - contemporary Arch	*		*	*	*	*	*	*	*	*	*	*	*
Computer	Computer-Aided Architectural Design 1	*	*	*	*	*	*	*	*	*	*	*	*	*
	Computer-Aided Architectural Design-2	*	*	*	*	*	*	*	*	*	*	*	*	*
	BIM / virtual reality	*		*	*	*	*	*	*	*	*	*	*	*
Built environment	Urban Design	*		*	*	*	*	*	*	*	*	*	*	*
	Man and Built environment	*		*	*	*	*	*	*	*	*	*	*	*
	Planning				*	*	*	*	*	*	*	*	*	*

		King Saud University / Architecture and Building Science									
		Prince Sultan University	King Faisal University	King Abdul-Aziz University	Umm Al-Qura University	Effat University	Dar Al-Hekma College	Minerals	Taibah University	Jazan University	University of Hail
Building	Housing	*		*	*				*		*
	Interior Design	*			*					*	*
	Landscape Architecture	*	*		*	*	*			*	*
	Building Constructions	*	*	*	*	*	*		*	*	*
	Building Constructions II	*		*	*	*	*	*	*	*	*
	Building Constructions III			*	*					*	*
	Building Constructions V				*						*
	Building Legalizations	*			*						*
	Structure in Architecture I	*	*	*	*	*	*	*	*	*	*
	Structure in Architecture II - concrete design	*		*	*	*	*	*	*	*	*
	Structure in Architecture III - Steel design				*					*	*
	Building Structures and Materials		*	*	*	*	*		*	*	*
Building Engineering	Surveying	*	*		*		*	*	*	*	*
	Building materials	*	*	*	*			*	*	*	*
	Energy and Design - Environmental control	*		*	*	*		*	*	*	*
	Mechanical, Electrical and Safety Systems	*	*	*	*	*		*	*	*	*
	Building Mechanical systems II - Environmental control		*	*	*	*	*	*	*	*	*
	Lighting Systems		*	*			*	*	*	*	*
	HVAC Systems		*	*			*	*	*	*	*
	Sanitary and technical installation	*		*			*	*	*	*	*
	Electrical systems		*	*			*		*	*	*
	Acoustics & illumination	*	*	*	*		*	*	*	*	*
	Green building systems			*	*				*	*	*
	Geotechnical Engineering - Soil mechanics and foundation		*					*	*	*	*
Construction Documents	Construction Documents						*	*	*		*
	Construction Documents II - Contracts and Liability						*				
	Quantity Surveying	*		*						*	*
	Working Drawings	*		*	*	*			*	*	*

		King Saud University / Architecture and Building Science	Prince Sultan University	King Fahad University	King Abdul-Aziz University	Umm Al-Qura University	Effat University	Dar Al-Hekma College	Minerals	Taibah University	Jazan University	University of Hail	Al-Baha University	Natran University	
	Working Drawings II			*	*							*	*	*	
Management topics	Economics (construction - Housing)		*	*		*	*			*		*	*	*	
	Project Management	*	*	*	*	*	*			*	*	*	*	*	
	Programing	*		*											
	PSYCHOLOGY & SOCIOLOGY IN ARCH (humanities)	*			*	*		*		*					
	Professional Practice	*			*	*	*	*	*			*	*	*	
Design Studios	Capstone Project Preparation	*			*	*	*	*	*	*	*	*	*	*	
	Architecture Design Studio -1	*	*	*	*	*	*	*	*	*	*	*	*	*	
	Architecture Design Studio -2	*	*	*	*	*	*	*	*	*	*	*	*	*	
	Architecture Design Studio -3	*	*	*	*	*	*	*	*	*	*	*	*	*	
	Architecture Design Studio -4	*			*	*	*	*	*	*	*	*	*	*	
	Architecture Design Studio 5	*			*	*	*	*	*	*	*	*	*	*	
	Architecture Design Studio 6	*			*	*	*	*	*	*	*	*	*	*	
	Architecture Design Studio 7	*			*	*	*	*	*	*	*	*	*	*	
	Architecture Design Studio 8						*	*							
	Architecture Design Studio 9							*							
	Capstone Project	*	*	*	*	*	*	*	*	*	*	*	*	*	
Internship Electives	Architecture Elective (8)									*					
	Architecture Elective (7)									*					
	Architecture Elective (6)									*					
	Architecture Elective (5)									*					
	Architecture Elective (4)	*	*			*			*	*					
	Architecture Elective (3)	*	*	*		*	*	*	*	*	*	*	*	*	
	Architecture Elective (2)	*	*	*	*	*	*	*	*	*	*	*	*	*	
	Architecture Elective (1)	*	*	*	*	*	*	*	*	*	*	*	*	*	
Internship	Internship I				*	*	*	*	*	*	*	*	*	*	
	Internship II		*	*	*	*	*	*	*	*	*	*	*	*	

Curriculum Models:

King Saud, King Fahd and King Abul-Aziz universities are the oldest and have the most developed curriculum and constitutes the reference for the rest of the architecture universities. Their curriculum is based on a hybrid model that started with the Bauhaus generated American model then transformed after a series of developments into unique programs. Students are enrolled for three different phases:

- General studies: It aims to develop their basic design skills and drawing abilities while assimilating theoretical knowledge related to the built environment disciplines.
- Intermediate phase (Junior): In this phase, core applied and theoretical knowledge is developed and advanced architectural engineering skills are being developed.
- Professional phase (senior): This phase aims to build environmental and global awareness and developing management skills. There are university requirements, college requirements, and departmental requirements. Most of the university requirements are required in the first year.

All the other universities curricula are different modified versions of this curriculum (Joseph, 2010).

Position Statements:

Some of the surveyed curricula were oriented to environmental studies where sociology and human culture have an impact on the social and physical environment and their design related courses are in the core of the courses, while in other cases engineering and building science where courses of mechanical and electrical in addition to structure and design courses are in the core courses, while the rest are elective courses. In the third orientation, architecture design pedagogy is supplemented with history and theory courses.

All the surveyed curricula were split somehow into three different phases:

- Introductory Stage: one or two years dedicated to offering students basic science, basic design, and the development of their imagination and conceptual skills
- Intermediate Stage: after the introductory phase, for two to three-years stage, students are specialized in one of the core disciplines mentioned earlier in this section: architecture, environmental design, or construction engineering.
- Professional Stage: one year of professional studies that include courses in professional practice, building economics, and the graduation project. **Programs' Objectives:**

Some of the surveyed programs target graduate architects with extra engineering backgrounds, others target graduate architects with humanities and environmental backgrounds. They all have a dose of building science background. The overall objectives vary according to the position statement of each program. In general, the objectives can be rounded in the following points:

- Provide students with the knowledge and skills necessary for the practice of architecture.
- Prepare graduates who can contribute to the development and improvement of the Saudi local natural and built environment.
- Develop the students' intellectual awareness of the physical and spiritual factors constraints and their impact on the designed environment.
- Preparing future generations of architects who can propose design and planning solutions for local problems, assimilate environmental and technological factors that influence the building industry, and manage the design and execution of buildings.

4. Conclusion and Recommendations

The research proved that key skills defined by the professional market are almost aligned with the educational trends within the educational architecture schools in the Kingdom despite that the research did not investigate the details of the courses' contents. It also showed that there is a big variation in the given dose of many knowledge fields like design, computer and building science. Building construction and computer applications, in addition to construction management axes, need to be enhanced in terms of content and the number of contact hours. This can be achieved through obligatory courses or elective ones to match the required key skills of the job postings. The research recommends that the curriculum of architecture schools within the Kingdom needs to be standardized through efforts to be led by the Ministry of Education. This will ensure maintaining the minimum standard of skills and knowledge of the graduated architects. Moreover, the curriculum in architecture schools within the Kingdom must be updated periodically and aligned with the professional market required key skills.

It is recommended that specialized diplomas that give professional architects deeper and more specialized knowledge in key fields like sustainability accreditation and building codes and projects management should be facilitated by architecture educational institutes within the Kingdom in cooperation with the Saudi professional societies.

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