

# CHAPTER 11

## KAUST: An International, Independent, Graduate Research University

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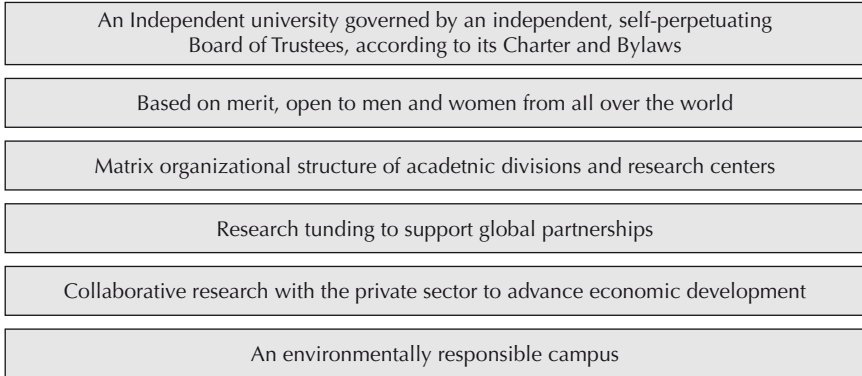
### INTRODUCTION

**E**ducation, research and economic development are among the highest priorities established by King Abdullah for Saudi Arabia. An equally important overriding priority for him is the development of women for greater participation in the workforce. According to UNESCO, women make up 58% of the total student population of Saudi Arabia, and yet only 16% of the Saudi workforce (excluding foreign workers) is made up of Saudi women. To advance his agenda, the King has increased support for higher education tenfold over the past two years, and promises to maintain it at that level for the next ten years. This year he authorized funds for the construction of two new university campuses, both for women, at approximately \$10 billion each. He has also boosted the government outlay to all of Saudi Arabia's 20 other universities.

While this new level of funding will likely improve the quality of higher education and make it available to a greater segment of Saudi society, its focus is primarily on undergraduate degree programs and the professional schools (medicine, business, engineering, etc.). King Abdullah's pride and joy is KAUST (King Abdullah University of Science and Technology), not only because it carries his name, but also because it is envisioned as a model for the global research university of the 21st century. The initial concept of KAUST as an elite, relatively small, international, financially independent, graduate university (Figure 1) was introduced to King Abdullah (under a different

name) by a small group of advisors in June 2006. Today, only three years later, construction of its \$10 billion campus is almost complete, most of its research facilities are in the final stages of acceptance testing, many of its initial cadre of faculty are in the process of moving themselves and their families to Saudi Arabia, and all plans are on schedule for opening day on 5 September 2009. KAUST's incoming class is expected to be ~400 graduate students.

**Figure 1:** The KAUST concept



## PERSONAL CONNECTION

My personal involvement with KAUST started during the concept formulation stage in the spring of 2006. I later participated in several KAUST-sponsored programs, primarily as an advocate and advisor. In May 2008, I accepted a formal appointment with KAUST as its Founding Provost and the first member of its academic faculty. Exactly one year later, I resigned from KAUST and returned to the University of Michigan. I provide this background to place in context the material contained in this presentation, most of which will be factual information about the story of KAUST to date, but often intermingled with personal observations and lessons learned. In brief, my association with KAUST was a unique and exhilarating experience, very rewarding, highly demanding and certainly memorable.

## THE KAUST MISSION IN BRIEF

Whereas King Abdullah has been the financier and driving force behind the establishment of KAUST, and Minister Naimi, chair of its Board of Trustees, has been its chief guide and archangel, Frank Rhodes has been KAUST's spiritual leader and mentor. Frank's role is most evident in his articulation of KAUST's academic philosophy, through both its Bylaws and Articles of Gov-

ernance. KAUST's mission (Articles of Governance, 2008) is captured by the following excerpt:

*The University exists for the pursuit and advancement of scientific knowledge and its broad dissemination and benevolent application. As a world-class research university, King Abdullah University of Science and Technology will be a catalyst for diversification of the Kingdom of Saudi Arabia to a knowledge-based economy. By these means, the University serves not only the Kingdom of Saudi Arabia, but also the larger region and the world.*

*Independent in its character, international in its membership, scientific and technological in its focus, the University provides graduate-level instruction, awards masters' and doctoral degrees, undertakes advanced research, and collaborates with other organizations in pursuit of its purposes.*

*Members of the Faculty are dedicated to research, teaching, and the advancement and application of knowledge. As such, they have an obligation not only to their scholarly professions and the University but also to their students and the larger society. This obligation requires an environment of openness and free inquiry, if the University is effectively to serve the public interest. The Articles of Governance are intended to nurture and support that environment, and thus to promote the well-being and effectiveness of the University.*

*As the Bylaws state: "Within the University, the faculty members shall enjoy the academic freedom and freedom of research available in international universities, and shall use such freedom and rights to boost the students' knowledge in their fields of specialty, improve their scientific competencies and skills, and develop and enrich knowledge." The Faculty shall have a fundamental role in University governance pursuant to mechanisms set forth in Article II, Article V, and such policies, consistent with the Articles of Governance, as the University shall from time to time establish.*

## ACADEMIC INFRASTRUCTURE

The birth of KAUST is characterized by two overriding features: speed and parallel development.

### KAUST Speed

From breaking ground in October 2007 to completion by August 2009, the 20-month-long, \$10-billion construction project of the KAUST campus is nothing short of monumental in size, scope, environmental quality, complexity and speed. Realization of the physical infrastructure (Figure 2) — which included 3,000 housing units for faculty, staff and students and all of the usual services of a small town (schools, health clinic, shopping mall, entertainment centres, restaurants, etc.) — could not have been possible had it not been for the heroic efforts of a highly experienced group of about 200 engineers and

managers that was seconded to KAUST by ARAMCO. That said, we also know that buildings and laboratory facilities are only a necessary, but not sufficient condition for establishing a viable research university. The heart of an academic institution is its people — the faculty, staff and students, and its soul is the collective academic environment that defines its values, relationships and expectations.

In the spirit of democracy and self-governance, we (academics) are accustomed to an environment in which all significant (and all too often even insignificant) decisions are made through a lengthy process involving committees, meetings and more meetings. Moreover, under common circumstances, when we assume academic administrative positions, we move into fully operational systems capable of functioning autonomously, with or without us. KAUST started from scratch, which is both an opportunity and a challenge. When I was appointed as KAUST's chief academic officer, I was a chief of a tribe of one, myself. I had no academic staff of any stripe or description, not even a secretary. And yet, I was expected to create the critical mass that will soon evolve into a world-class research university (Figure 3). With the help of and active participation by several American and European universities, I managed to recruit Division Chairs (equivalent to deans), some

**Figure 2:** Main KAUST campus



### Figure 3: Fast facts about KAUST

Language of Instruction: English

Initially, KAUST will have 400 grad students; at maturity **2,000** (1000 master's and 1000 Ph.D. students)

Initially, KAUST will have ~ **100** faculty members, building to 250 at maturity

Full research community at KAUST will consist of **1,500** people (not including students)

At maturity, the KAUST community will have **20,000** residents

50 faculty, directors of multidisciplinary research centres, librarians, registrars, admission officers, budget managers, etc.

We also developed degree programs, admission and graduation requirements, faculty and staff policies, and created offices to support student services, arts programs, symposia and workshops, and many of the activities commonly enjoyed on academic campuses.

Throughout the recruiting process, many colleagues expressed concern and scepticism about KAUST's ability to attract accomplished faculty and highly promising graduate students. The question often asked by many is: "How are you able to convince highly successful professors to leave their well-established, secure positions at prominent universities and move to a hitherto unknown, unproven university, in a country that does not have the history or tradition of academic research?" KAUST's attraction consisted of three important ingredients:

- World-class research facilities, supported by a group of highly qualified technicians and engineers. From one of the fastest supercomputers in the world to the latest instrumentation for nanofabrication and characterization, KAUST offers its faculty and graduate students unparalleled capabilities.
- Ample funding to support research activities.
- Attractive compensation packages, including housing and other benefits.

It is significant that in addition to recruiting a cadre of superb faculty and staff, KAUST recruited some 400 graduate students, from 60 different countries, all on par, in terms of academic qualifications, with those attending graduate programs at top U.S. and European universities.

### Parallel Development

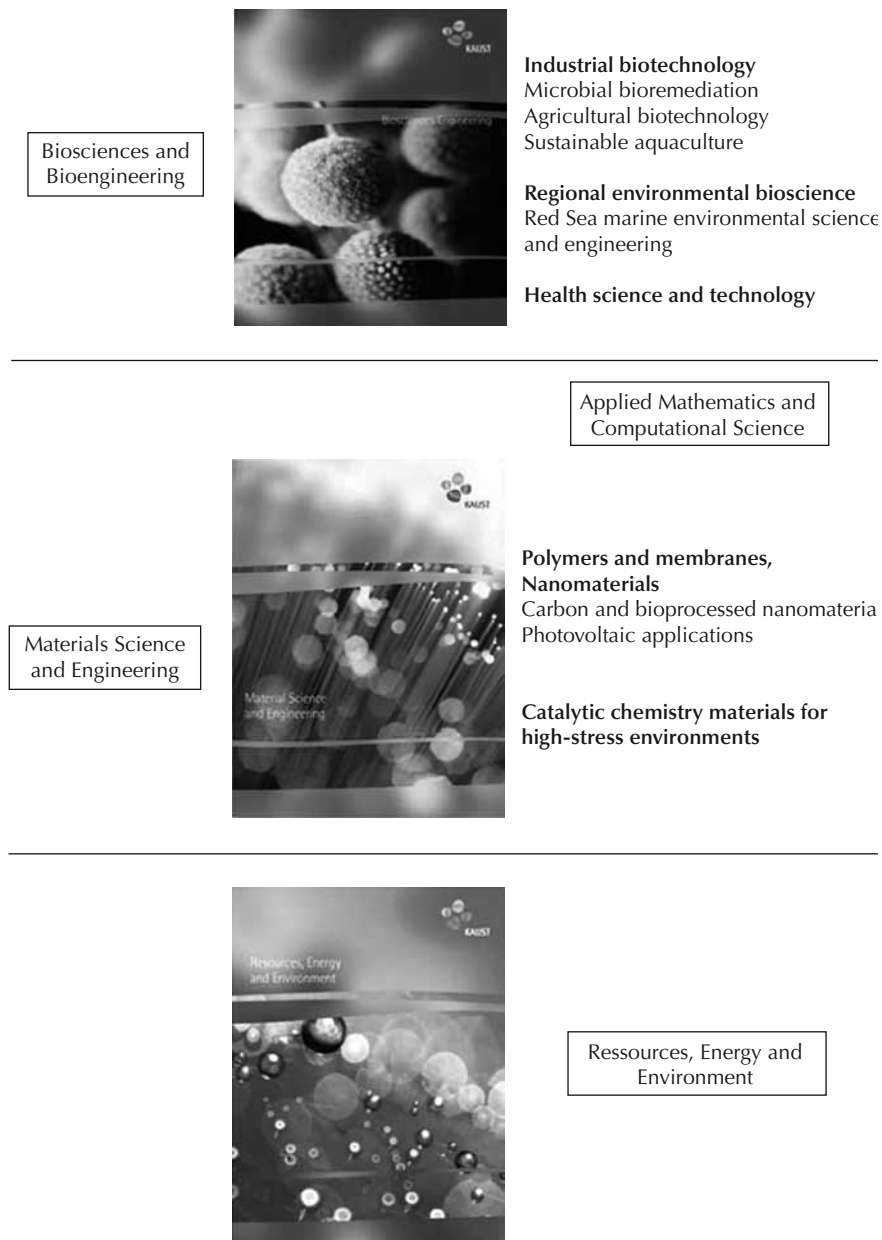
When executing a complex project, some of its tasks may be carried out in parallel, while others may require sequential programming. Because of the time pressure — and the absence of academics in the early stages — KAUST could not afford to obey the sequential programming logic. In 2007, several strategic plans were developed to design KAUST's academic infrastructure, but they

were led by different teams with limited coordination between them. Stanford Research Institute (SRI) was contracted to define the research directions that KAUST should support (Figure 4), on the basis of both relevance to Saudi Arabia and significance as a frontier area of science and technology. The Washington Advisory Group contributed a plan that specified which academic disciplines and degree programs KAUST should offer, and how to recruit faculty through partnerships with U.S. and European universities. Independently, KAUST contracted with several academic and industrial institutions to acquire designs and specifications for state-of-the-art experimental facilities that can support MRI, nanofabrication, gene sequencing, and similar types of instruments. Also, a teraflop supercomputer was procured from IBM. In an ideal scenario, such disparate but interdependent strategic plans and contractual arrangements would be fully integrated, necessitating extensive coordination and multiple iterations. Unfortunately, that was not the case, so one of the major challenges at KAUST was to figure out how to integrate or realign the individual parts of the overall academic puzzle so that they become compatible elements of a coherent whole.

## EXPECTATIONS AND VULNERABILITIES

To its advantage, KAUST possesses two critical ingredients for success: financial resources and highly dedicated staff. I have no doubt that KAUST will succeed in realizing its stated mission of becoming a world-class research university in the not-so-distant future. How well it succeeds and how quickly it realizes its mission will depend on a third, equally important, ingredient, namely its academic leadership. KAUST has many supporters, within and outside Saudi Arabia, but it also has its detractors. KAUST is viewed by a segment of Saudi society as a threat to accepted social norms. While KAUST will not likely have to face the financial challenges that many universities around the world are now facing, its Board of Trustees and academic leaders will be constantly challenged by how to mediate the wide array of highly conflicting perspectives held by its many stakeholders, from lifestyle and gender-related issues to academic freedom and freedom of speech.

**Figure 4:** KAUST research thrusts



## REFERENCE

Articles of Governance. (2008). King Abdullah University of Science and Technology, Thuwal, Saudi Arabia. pp. 1-2.