

## Curriculum Change in Agricultural Universities Strengthens Links in the Arab Republic of Egypt's Innovation System

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### SYNOPSIS

Falling enrollments and mismatch between graduates' skills and labor-market requirements inspired a curriculum change project in five agricultural universities in Egypt. The project's strategy was to strengthen connections between important institutions in the innovation system (universities, private firms, and commercial farms) while transforming academic programs. Leaders from the academy and the private sector participated in a steering committee that guided the project's implementation. Based on a skill gap analysis that revealed the human resource needs of private employers and the corresponding weaknesses in academic programs, faculty updated core courses and made them more consistent in content as well as academic standards. The project also trained faculty, instituted active learning and recognition of good teaching, and improved the use of teaching aids. An overseas study tour formed the basis for significant institutional changes in the participating universities; for example, the universities organized external advisory committees to provide feedback on sector development and labor-market needs to university management. The universities also established internship programs and career resource centers. Additional links were forged between the university and others in the AIS through the establishment of extension-outreach centers, which enabled universities to provide direct assistance to communities and, in turn, learn about real community needs. The main lesson from the design and implementation of this project is that curriculum reform is complex, involving many aspects of the academic program, the university administration, and stakeholders. One approach to ensure institutionalization of the reforms would be for the project to include a mechanism for continuing high-level dialogue with stakeholders.

### CONTEXT

Egypt's agricultural universities were losing students. Outdated courses and limited contact with prospective employers produced a significant number of unemployed graduates whose skills did not match labor-market requirements. The quality of education had deteriorated because faculty lacked the resources to conduct research or pursue professional development. The Institutional Linkage Project, a component of the USAID-funded Agricultural Exports and Rural Income (AERI) Project, was designed to help five agricultural universities in Upper Egypt reassess their course content and create a model curriculum that other universities could adopt. (See also IAP 9.)

### PROJECT OBJECTIVES AND DESCRIPTION

The strategy of the AERI Linkage Project was to strengthen connections between important institutions in the innovation system (universities, private firms, and commercial farms) while transforming academic programs. The process began with a skill gap analysis that revealed the human resource needs of private employers and the corresponding weaknesses in academic programs. Based on this analysis, three broad steps emerged to support the project's overall goal:

- **Step 1.** Active teaching and learning methods were introduced to faculty to develop the higher cognitive skills (such as critical thinking, problem solving, and decision making) that private employers were seeking in graduates.
- **Step 2.** Content of the "core courses" (taken by all agricultural students) was updated.
- **Step 3.** Based on a strategic planning exercise by academic and private sector leaders, the universities organized external advisory committees and internship programs as well as career resource and extension outreach centers.

## INNOVATIVE ELEMENTS

Innovations in project design and implementation included:

- Leaders from the academy and the private sector participated in a Steering Committee that guided the project's implementation.
- A skill gap analysis identified knowledge and skill deficits in recent graduates.
- Academic staff participated in redesigning and improving courses and learning materials.
- University deans and private sector leaders gained first-hand views of overseas university systems.
- External Advisory Committees were created and provided feedback on sector development and labor-market needs to university management.
- Student internship programs were developed.

Details on the project's experience with these innovations follow.

### Role of the steering committee

A Steering Committee of Egyptian academic and private sector leaders guided planning and implementation of the project's capacity-building component. Their participation helped bridge the gap in understanding and cooperation between the private sector and the participating institutions. The committee met periodically to review and approve all major project activities and to select and/or approve nominees for major activities such as overseas study tours.

### Skill gap analysis

The skill gap analysis involved 254 private employers and 1,000 university graduates who had been out of school and/or working for at least one year. Private firms and recent graduates agreed that university students needed to develop critical thinking, problem solving, and decision-making skills, as well as effective communication and teamwork skills. The common method of teaching through lectures did not actively involve students in learning. It emphasized knowledge recall at the expense of higher cognitive skills such as analysis, synthesis, and evaluation. The first step in providing students with the skills they lacked was to transform the teaching/learning methods at the universities.

### Active teaching and learning

Altogether, 239 university faculty members participated in seven in-service workshops on active teaching/learning

methods. These two-day events focused on the science, mechanics, and art of teaching as well as skills to elicit learning. The workshop emphasized active, problem-based learning strategies. Educators from the United States conducted three follow-up workshops with 139 faculty members who had completed the first round of workshops. Outstanding Egyptian teachers who emerged from the first workshops organized additional in-service workshops for faculty who did not speak English. Nine such workshops were conducted for 234 faculty members from all five universities.

### Leadership study tour generates ideas for change

Nineteen deans and department heads traveled with private sector leaders interested in strengthening the universities to visit four United States land-grant universities with important faculties of agriculture. The tour emphasized how each university worked closely with the private sector to modify the curriculum, established internship programs, operated career centers, and incorporated practical skill training into their respective academic programs. During a two-day strategic planning workshop following the tour, participants discussed and developed the elements of a plan to incorporate similar ideas in their universities. The tour enabled participants to see the value of advisory committees involving the private sector, including their potential to promote partnerships between the private sector and the university system. The conclusion was that the study tour "formed the basis for significant institutional changes in the participating universities" (Swanson, Barrick, and Samy 2007).

### Course development workshops

The skill gap analysis demonstrated the need for the universities to change their curricula, but that would be difficult in view of the time and effort needed for the Supreme Council for Higher Education to approve the modifications. As an alternative strategy, the basic structure of the curriculum was retained and individual courses were modified to reflect the current knowledge base in each field of study. The focus shifted to updating basic course content and teaching methods and developing common academic standards across all five universities, especially for the common core courses.

Course development workshops, attended by faculty members and teaching assistants responsible for the core courses, adapted courses to become more consistent in content as well as academic standards. The Midwest Universities Consortium for International Activities (MUCIA) selected

outstanding teachers from partner universities in the United States to conduct the workshops. They brought their recommended book for the particular course plus an array of teaching materials (such as the course outline or syllabus, PowerPoint presentations, videos, and classroom exercises, quizzes, and examinations).

### **Implementing faculty development programs at United States universities**

Faculty development programs consisted of a six-week program split between two United States universities in MUCIA or a four-week program at one university. The vast majority of participants (93 percent) intended to modify their teaching methods in various ways, by promoting greater student-teacher interaction, encouraging more use of the Internet, making courses more market driven, bringing in more guest lecturers, stressing practical applications, increasing field visits, and promoting more team-based learning.

### **Developing external advisory committees**

Workshops led by MUCIA specialists helped to organize this institutional innovation. Following the first workshop, three follow-up workshops were organized to discuss progress. At a separate, one-day workshop held later (April 2006), academic leaders from each university and the private sector members of their respective committees met to compare experiences and outline plans for building public-private partnerships.

### **Forming internship programs and other links in the innovation system**

The external advisory committees promoted the development of student internship programs in collaboration with private firms. Additional links were forged between the university and others in the AIS through the establishment of Extension-Outreach Centers. The centers enabled universities to provide direct assistance to communities and, in turn, learn about real community needs. The establishment of Career Resource Centers helped students plan coursework and prepare themselves for seeking employment.

## **PROJECT IMPACT AT MID-TERM**

The project created greater awareness of the importance of supporting major change in the knowledge and skill profiles

of graduates from agricultural universities, and it successfully engaged university administrators and faculty in bringing about those changes. Among the achievements noted in mid-term project reviews were:

- **Active teaching/learning methods.** Sixty-seven percent of professors had adopted and thirty-three percent had partially adopted the new methods. The methods seem to have improved interactions between professors and students.
- **Course development workshops.** All participants found the workshops conducted to review courses and introduce new material relevant to their particular courses; 53 percent fully adopted the recommended modifications to their course. The remaining 47 percent adopted some of the materials or recommendations. (Note that the project also supplied computers and LCD projectors to use with the updated teaching materials.)
- **Links to private employers.** The study tour was effective in convincing university administrators that public-private cooperation benefits future employers of graduates and the university.

## **LESSONS LEARNED AND ISSUES FOR WIDER APPLICATION**

The main lesson from the design and implementation of this project is that curriculum reform is not as straightforward as it might seem.<sup>1</sup> It is a complex process involving many aspects of the academic program, the university administration, and stakeholders. For example, a revised or updated curriculum without improved teaching materials and appropriate pedagogical skills is unlikely to have much impact. The benefits of a revised curriculum will not be sustained unless the curriculum keeps pace with stakeholders' evolving needs. Key stakeholders inside and outside the university must contribute their perspectives on the knowledge and skills needed in a developing agricultural sector. To ensure support for curriculum change, teaching staff, administrators, and stakeholders must be consulted and engaged as partners in making the desired changes. Despite impressive reforms in the curriculum, capacity building for academic staff, and improved links to agribusiness, the question of whether these five universities can sustain their efforts appears unanswered. One approach to ensure institutionalization of the reforms would be for the project to include a mechanism for continuing high-level dialogue.