

Curriculum Change in Higher Agricultural Education

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SYNOPSIS

Agricultural curricula require frequent updating to remain relevant to the agricultural sector, its many stakeholders, and the AIS. Updated curricula must reflect technological and social change, consumers' preferences and concerns, external phenomena (climate change, globalization), and governance issues related to natural resources. Modern agricultural curricula feature a learning approach centered on students, use a range of technology for instruction, and emphasize practical experience gained at university laboratories, farms, other facilities or external sites. Curriculum change can be undertaken directly through the academic institution, key stakeholders, and faculty or indirectly through student and faculty links to rural communities and other stakeholders. Key recommendations are to take the time needed to communicate with all key stakeholders, base changes on a thorough analysis of needs as perceived by all stakeholders, institutionalize changes to the curriculum and in the roles of stakeholders within and outside the university, and press for adequate, sustained financial resources. If new skills (beyond the technical and production agriculture skills traditionally taught in AET systems) are identified in the needs analysis, the question of how and where they will be taught must be answered. Establish a mechanism for regularly monitoring and evaluating the impact of curriculum change; this information is important for decision makers who make policies supporting higher agricultural education. Ensure that curriculum change is sustained through organizational mechanisms that involve all key stakeholders on a regular, ongoing basis. Encourage links with universities that have completed or are in the process of implementing curriculum change. Finally, changing the content of the curriculum may be the easiest part of investing in curriculum change. Additional investments will be required in organizational arrangements, staff and faculty

capacity, and monitoring and evaluation. This expanded agenda, its cost implications, and the time needed to complete the change process, must be considered when making investments in curriculum change.

BACKGROUND AND CONTEXT FOR INVESTMENT

For the agricultural sector, the AIS, and the rural space more widely, agricultural curricula require frequent updating to reflect technological and social change as well as consumers' preferences and concerns, external phenomena such as climate change and globalization, longstanding agricultural and social issues affecting the rural poor, and governance issues related to natural resources, including legal rights to those resources (Villarreal 2002). Aside from technical knowledge, awareness is growing that students also require skills in listening, analyzing problems, seeking innovative responses, and communicating if they are to work effectively in any setting. Although specific reforms will be driven by clearly defined needs, curricula that fit the human resource requirements of modern agriculture have been described (Ruffio and Barloy 1995; Wallace 1997; McCalla 1998).¹

Universities typically are alerted to the need to revise, update, and reform curricula by concerned stakeholders, international exposure of staff to other university curricula, and the internal realization that students are not well prepared for the world of work. Curriculum change, once the need is recognized internally, is perceived as less threatening than major organizational reform and can usually be completed in a shorter time. The danger of opting for curriculum reform, however, is that the institution may be avoiding true organizational reform (Hansen 1990). Given that a relevant curriculum must reflect the labor market's needs for graduates, however, sooner or later the university

may be forced to confront and correct the governance, administrative, and academic weaknesses that prevent it from meeting the needs of stakeholders in the agricultural sector.

INVESTMENT NEEDED

The specific investments that make agricultural curricula more relevant can be divided into those that catalyze curriculum reform and those that support the individual activities through which a curriculum is revised and integrated into academic programs. Although external actors—whether they are government, donor, or other stakeholders—can catalyze the decision to revise the curriculum, the AET institution itself must assume the role of champion. Internal leadership that mobilizes faculty, staff, and key stakeholders in favor of curriculum change is critical to success.

Investments for catalyzing reform include:

- Support for stakeholder interactions that examine the relevance of the present curriculum to labor-market needs.
- Resources to ensure that a strategy for undertaking curriculum change is developed.
- Investments that support the curriculum change strategy may include:
 - Support for staff to design, develop, and produce new content for the curriculum and the corresponding learning methods and materials (IAP 3 provides an example from the Arab Republic of Egypt).
 - Training for teachers, instructors, and facilitators to ensure that they are comfortable with the new material and have the confidence to guide students in a learning rather than a teaching mode.
 - Support for teaching and facilitating staff to learn to use ICT effectively in teaching, learning, and more effective communication in the wider AIS.
 - Training to ensure that practical sessions are planned and implemented effectively (see the discussion that follows). Staff and students who are unaccustomed to practical skills programs will require orientation. The programs themselves will require added inputs to ensure that they meet high standards and are delivered well.
- Faculty and staff may need to be introduced to the successful use of external resource persons for enriching academic programs (see the discussion below).
- Support for university-community interaction to foster curriculum change indirectly (see the section on “Potential Benefits”).

A critical area for support is to ensure that the new curriculum reflects and improves links to stakeholders in the agricultural sector. Such links have been weak in AET in developing countries. Curriculum change places new pressures on administrators and faculty, and investments in capacity building are needed for these groups to cope with new and more intensive demands from stakeholders and students. Additional investment will be required to establish a mechanism that ensures continuous contact with stakeholders and reviews and analyzes feedback to adjust the curriculum.

One of the most important opportunities that arise during curriculum reform is the opportunity to use stakeholders as external learning resources. The wealth of knowledge, skills, and goodwill for agricultural education among most stakeholder groups can be captured and presented to students in the classroom or at practical work sites. A significant means of improving links between the university and external learning resources in the agricultural sector is to develop practical skills programs in which students are attached to stakeholders. To initiate and manage these programs, support is needed to visit field sites where such schemes have been implemented successfully and, based on these visits, to design a local attachment program. Next, the program concept has to be shared with potential participants—such as farm owners and agribusinesses (see also module 5 and module 3, TN 2)—to further define and establish the program. Once agreement to initiate the program is reached, it is vital to clearly state the terms under which it will be implemented, including statements of the responsibilities of trainees, hosts, and the university or educational institution. The issue of cost sharing must be part of the attachment program design and must be agreed in negotiation with attachment site hosts.

As a final note, it is important to recognize that all curriculum change initiatives will lead to the realization that some aspects of implementation require investments beyond amending or updating content and packaging.

POTENTIAL BENEFITS

Curriculum change can be undertaken directly, with the academic institution and the involvement of key stakeholders and faculty, or indirectly through student and faculty links to rural communities, which channel real issues in rural livelihoods back to the university, where they influence the research program and curriculum. Either way, curriculum change can have a number of impacts.

Decision makers as well as prospective students and employers come to see higher education institutions as a

prime source for human resources for the agricultural sector. In Costa Rica, where the EARTH University curriculum was designed to meet a range of stakeholders' needs, the evidence that considerable value is placed on the university is reflected in its admission applications; requests for places outnumber slots by 40 to 1 (IAP 6).

Graduates of the institution are well prepared to meet employers' needs (the labor market) and the challenges of the agricultural sector and rural development. Graduates from EARTH University and Zamorano University (the Pan-American agricultural school in Honduras) are in high demand because their mix of skills prepares them for a wide variety of employment and entrepreneurship.

Graduates are confident and involved in the AIS as researchers, service providers, observers, listeners, communicators, and contributors of innovative ideas and solutions to agricultural and rural development problems.

The higher educational institution is aware of researchable issues and problems through its interactions with stakeholders. Faculty and students from Bogor University in Indonesia (box 2.8, TN 1) and Chiang Mai in Thailand (IAP

5) work with rural communities to better understand real-life challenges and identify researchable topics.

The morale of faculty and staff is boosted by interaction with stakeholders and new approaches to teaching and learning (the Egypt Curriculum Change project described in IAP 3 reflects such an interaction).

The institution gains a heightened awareness of the importance of organizational reforms beyond curriculum change, perhaps including reforms to improve governance, increase autonomy, and improve remuneration and benefits for faculty, staff, and administrators.

The higher educational institution attracts additional resources because it prepares human resources effectively for the agricultural sector. For example, through the Sasakawa Africa Fund for Extension Education (SAFE), students in Africa undertake a supervised enterprise project in communities that brings in support from the private sector (IAP 4). The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) includes a community-based master's research program that has attracted considerable donor funding (box 2.10).

Box 2.10 Regional Universities Forum for Capacity Building in Agriculture: Fostering Capacity for Innovation and Adaptation among Students

The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) is a consortium of 25 agricultural universities and faculties in Eastern, Central, and Southern Africa. To date, its main activity is to offer a small grants program for MSc studies in agriculture, although the program is being expanded to include doctoral studies. Through its community action research program, RUFORUM also provides grants for strengthening the links between rural communities and member universities. RUFORUM's mission is to "foster innovativeness and adaptive capacity of universities engaged in agricultural and rural development to develop and sustain high quality in training, innovative and impact-oriented research, and collaboration."

RUFORUM was originally sponsored by the Rockefeller Foundation and covered 12 universities in Eastern and Southern Africa. It was established as a consortium under African ownership and management in 2004 and is registered as a nongovernmental organization in Uganda with a secretariat in Kampala. Each member university pays an annual fee and several international

Source: RUFORUM 2010.

donors, including the Bill and Melinda Gates Foundation, have made grants to the organization. Fundraising will be key to the consortium's future, as donor grants will eventually end.

Under its competitive grant program for MSc students, RUFORUM awards around US\$60,000 to enable two students to work under faculty supervision for two years. Relevance of the studies to African agriculture is a key criterion in making the awards. Each MSc thesis must focus on a topic of local importance for agricultural development.

RUFORUM provides MSc students with field-tested, problem-solving skills that many African universities are still unable to provide. During the first semester of year two of the study program, students are based in the field and their work is supervised in several visits by the faculty supervisor. After five years of experience, RUFORUM has succeeded in connecting graduate students directly with farmers, rural communities, and the reality of African agriculture.

POLICY ISSUES

Demand for curriculum change articulated by the AET system and supported by key stakeholders is an important precondition for gaining support from the ministries in charge of education and agriculture as well as from planning and finance decision makers. In turn, those stakeholders play a crucial role by clarifying the policies and channeling the resources that will support change.

Curriculum change has implications for the administrators, staff, students, and external stakeholders of higher educational institutions. These institutions, as bureaucracies, are often slow to agree to change. Change often proceeds slowly, caused by the perception that it is not approved at higher levels of government, that the old curriculum is good enough, that incentives to change are unattractive, and that, given time, the pressure to change will decrease. Policies are required to support curriculum change, to make it clear that change is a priority, that administrators and staff of educational institutions are required to implement the changed curriculum as part of their terms of reference, that stakeholders' input will continue to be integral to evaluating the impact of the new curriculum on graduates' performance, and that adequate funding will be made available to make the changed curriculum work.

Some of the most important policies encourage educational institutions to monitor the quality and relevance of their programs in relation to the evolving needs of agriculture and rural development. Such policies provide guidance on governance of the educational institution, especially the role of stakeholders in providing feedback on graduates' readiness for the modern agricultural workplace and in alerting the institution to changing requirements for knowledge and skills.

High-level decision makers outside higher educational institutions must be aware that they require a continuing flow of information to update or create policies that give the institutions the authority to act. Managers of educational institutions must establish systems that continuously and critically evaluate their programs (especially needs assessments that capture changes in the agricultural sector). This information, regularly provided to policy makers, should help to prevent educational policy from falling out of step with the needs of agricultural education institutions and their stakeholders throughout the agricultural sector. An essential policy, of course, is one that allocates funds to support change and ensures that such funding is sustained.

LESSONS LEARNED

Important lessons from previous attempts at curriculum change concern the impetus for change (who demands change, and who supports it); the steps that must be followed in the change process; and the possibility that curriculum change will reveal the need for further reform. Curriculum reform is not a one-off activity. To be meaningful, curriculum changes must continue to be updated as technological innovation develops new approaches to producing, storing, processing, and marketing agricultural products. Curriculum change must be institutionalized in AET systems and given the approval and recognition that ensures the sustainable, continuous evolution of the curriculum.

Impetus for change

As noted, the need for change may be articulated by employers who are dissatisfied with the graduates of agricultural degree programs, signaled by a serious drop in applicants to the degree program, or emerge from an internal awareness that the degree program is obsolete. Even if the pressure for change comes from one or more external groups of stakeholders, support for change must come from inside the higher educational institution as well.

Steps to bring about curriculum change

The previous section refers to some of the steps in curriculum change, but it is important to list them in their entirety. Based on experience with curriculum change in a variety of settings, these steps appear to work well, although processes will differ from one place or time to another:

- All key stakeholders participate in describing shortcomings in the current graduate knowledge and skill mix and/or needs not identified by educational institution.
- Draw up a clear "roadmap" for implementing curriculum change and make it available to all.
- Clearly spell out roles and responsibilities of the educational institution and other stakeholders in the change process.
- Describe incentives for participation in the change process (for example, capacity building for faculty and administrators or out-of-pocket expenses for stakeholders who have to travel to participate in meetings).
- Select milestones for reviewing progress in curriculum change. Such milestones could include: presentation of the analysis of the needs assessment; drafts of new

content for specific subject matter; proposed pedagogical changes to support the revised curriculum; infrastructure and teaching/learning tools required; and curriculum field test results and indicative amendments. Share these milestones with all stakeholders in workshop settings. Note and act upon stakeholders' comments.

- Submit the final draft of the proposed new curriculum for peer review by regional and international entities in higher agricultural education. Act upon the relevant comments.
- Present the new curriculum to policy makers and key stakeholder groups, highlighting the changes and seeking approval.
- Develop or purchase materials to support the implementation of the updated/new curriculum.
- Train faculty and staff to use the new curriculum, especially in the area of pedagogy, student-centered learning, field visits, and attachments to employer sites.

The “iceberg” phenomenon

Achieving curriculum change appears to be a relatively simple objective, but it can be like the tip of an iceberg: The immediate task (changing the curriculum) is the visible part of the iceberg, although in fact a number of less-visible, interconnected tasks must be undertaken for curriculum change to be effective. In addition to revising or developing a curriculum, it may also be necessary to improve capacity for pedagogy, update teaching materials, involve teachers in managing practical agricultural activities, and create and maintain active networks with stakeholder groups that include agribusiness, NGOs, and communities. This potentially expanded agenda, its cost implications, and the time needed to complete the change process, must be considered when making investments in curriculum change projects or programs.

RECOMMENDATIONS FOR PRACTITIONERS

The technical process of curriculum change needs to be preceded by dialogue with key stakeholders. It should conclude by putting mechanisms in place to monitor the impact of

curriculum change and support its sustainability. Key recommendations include:

- Take the time needed to communicate with all key stakeholders. While this may seem to delay the commencement of curriculum change, it is critical that all parties understand why the change exercise is being undertaken, support the objectives of the changes to which they have agreed, and appreciate their roles in ensuring a successful outcome.
- Changes to curricula must be based on a thorough analysis of knowledge and skill needs as perceived by all stakeholders
- Press for institutionalizing changes to the curriculum, roles of university faculty as well as stakeholders from outside the university, and adequate and uninterrupted financial resources.
- Underline the need for a mechanism for regular monitoring and periodic evaluation of the impact of curriculum change. This information is important for decision makers, who will want to be convinced that there is a positive return from investments in curriculum change and who will make the policies that support higher agricultural education.
- Ensure that curriculum change is sustained through organizational mechanisms that involve all key stakeholders on a regular, ongoing basis.
- Encourage links between universities (in country, regionally, or internationally) that have completed or are in the process of implementing curriculum change.
- Modern and modernizing employers in the agricultural sector seek graduates with skill sets that go beyond technical and production agriculture. This requirement presents a major challenge to curriculum reform. If new skills are identified in the needs analysis, the question of how and where they will be taught must be answered.
- Be conscious of the fact that changing the content of the curriculum may be the easiest part of investing in curriculum change. Additional investments will be required in organizational arrangements, staff and faculty capacity, and monitoring and evaluation. The need for these investments may not be obvious, but failure to make them will jeopardize the success of the investment in curriculum change.