

Changing the Curriculum and Teaching Methods in Chinese Agricultural Schools

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Abstract

In response to the nation's economic and agricultural system reform, Chinese agricultural schools have begun the transformation from academic institutions to vocational and technical education. Significant efforts have been made to reform the curricula, as it is the key element needed for the formation of the new educational system. Prior to the nation's reform starting in 1978, the curriculum in agricultural schools was theoretical information based and the instruction was teacher-centered. Students usually had little involvement in teaching and learning. In addition, the value of practical "hands-on" experiences in agricultural education had been neglected. During the past decade new ideas and approaches in curriculum development and instruction have been gradually incorporated into the agricultural vocational education through new policy initiatives and a pilot project launched by the Food and Agriculture Organization of United Nations during 1994-1998. The decentralization is one major feature of these changes.

Introduction/Background

China is undergoing a large transformation as its economic system is shifting from a centrally planned to a market-driven system (State Council, 1999). Agriculture the traditional foundation of Chinese society faces an especially great challenge in restructuring its system to meet the needs of the market economy. In particular, agricultural education is playing an important role in preparing people for a new phase of rural development. During the past decade, agricultural schools have started to take actions to reform their existing educational systems and to strengthen their vocational programs (Ministry of Agriculture, 1997).

There are 360 agricultural schools distributed among the provinces, autonomous regions, and municipalities throughout China. Agricultural schools are typically resident schools that require students to pass standardized admission exams. Schools usually enroll graduates from junior secondary schools and each program lasts for three or four years. The average enrollment for each school ranges from 1000-3000 students. One-third of agricultural schools are governed at the provincial level, while two-thirds are administered by prefectures. None of the schools falls directly under the Ministry of Agriculture (MOA). However, the Ministry undertakes the function of guidance and macro-management for all agricultural schools.

In the past, agricultural schools were academic institutions classified as secondary

specialized schools. The mission of these schools was officially described as to train intermediate-level specialists who were political and technical experts. Students were required to master basic theory, to have specialized knowledge, and to develop practical technical skills. Graduates from these schools were graded as "middle-level specialists" (Henze, 1984). Students were usually trained theoretically and narrowly. Most subjects studied in the schools were academic and usually had little relevance to the students' workplace and reality. Upon leaving school, graduates were often assigned jobs according to a centrally organized plan. Just like graduates from higher education institutions or at least in theory every graduate would be assigned to a job position that could be characterized as "white collar."

In recent years, significant changes have taken place to reflect the continued reform and the development of the "socialist market economy." Today, jobs for graduates are no longer guaranteed and the government can only hire approximately 50% of agricultural graduates (Chen, 2000). As a result, it is becoming increasingly difficult for an agricultural graduate to find a job in the public sector. Accordingly, graduates need to find their employment in the private sector or they need to be self-employed. Students' education has become more purposive and selective, since it now must relate to their training and to employment opportunities in the labor market. Moreover, the feedback to schools has indicated

that agricultural graduates have had difficulty finding jobs that reflects their educational knowledge and skills.

According to FAO (Food and Agriculture of the United Nations, 1997) the curricula used and teaching methods implemented have not always been relevant to the development objectives of individual countries, the needs of farmers, or to the labor market in general. As a result of China's economic reform movement, a mismatch of teaching strategies and curricula to meet the needs of the new economic realities has become evident in Chinese agricultural education (Ministry of Education, 1998).

There was a realization at all levels that students needed to be taught practically to meet the requirements of the labor force. One of the primary initiatives to meet the changes needed in agricultural schools was to modify the existing courses and to develop new curricula. The essence of this change was to decentralize the curriculum development process and introduce vocational elements into the existing system so it could better serve the local needs of agriculture and rural development.

Purpose

The purpose of this paper is to provide an insight of how curriculum change and new teaching methods have been introduced in Chinese agricultural schools since 1990s. The policy initiatives and practical approaches used to develop the curriculum will be presented in this paper. Suggestions for implementing curriculum changes will also be discussed here.

Methods

The results presented in this paper are based on a related literature review and are a summary of the authors' past experiences both as a teachers and consultants in Chinese agricultural schools. During the period 1995-2000, the authors visited and taught in several Chinese agricultural schools. The students in the courses were teachers and administrators representing more than 60 different agricultural schools throughout China. The content of the teaching programs included teaching methodology, Competency-Based Education (CBE), Modular Teaching Approach (MTA), and school farm management.

Policy Initiatives and Changes in Curriculum and Instruction

General principles for reform. In 1995, the Education Department of the Ministry of Agriculture (MOA) developed the general guidelines and goals for the reform of agricultural schools. As reported by Li, director, Education Department, MOA, these were:

According to the requirement of qualitative and quantitative manpower for agricultural industry, rural areas and society, and considering current problems which the agricultural schools have in common, each agricultural school should renew educational ideology, upgrade the pattern of manpower development, place emphasis on systematic adjustment of specialty structure, subject content and instructional methodology in order to produce qualified manpower and create a new and competitive mechanism which can meet the needs of the development of the socialist market economy (Li, 1995, p. 4).

In direct response to the needs of the workforce for the market-oriented economy, general agricultural schools are gradually being transformed to become specialized vocational and technical schools. The focus has shifted away from academic training to a vocation-based teaching scheme. The mission of schools has changed accordingly, and the schools are now officially charged with teaching comprehensive abilities and practical skills that can be applied to regional economic construction, service, technology, management, and development of rural areas (Chen, 1999). Agricultural schools have been required to direct their educational programs to target agriculture, rural areas, and farmers to emphasize local agricultural productivity. Major changes in curriculum and teaching methodology in Chinese agricultural schools over the past 10 years are summarized in Table 1.

From centralized to decentralized. In the past, administrative and managerial systems in control of curriculum design were hierarchical and centralized. In this old system, principles and general goals for creating the curriculum were set by experts and administrators in ministries, provincial educational departments, and academic institutions, and then passed down to the schools for implementation. Teaching was organized under a countrywide unified syllabus and curriculum. Schools and teachers were often

excluded in the curriculum planning and usually had little initiative to make changes during the curriculum implementation. This system made it impossible for schools and teachers to adjust the

curriculum structure and content. Also, to some extent, the system hindered social participation in education and discouraged the institutions' interests in serving society (Henze, 1984).

Table 1

Summary of Curriculum and Teaching Method Changes in Chinese Agricultural Schools

Curriculum and Teaching Methods	In the Past	Currently
Planning, Revision and Adjustments	Hierarchical and centralized system: experts, officials and authority dominated process.	Decentralized system: schools, teachers, employers, technicians and expanded stakeholders involved in a participatory process.
Structure	Fixed and ossified: 3 components: basic subjects; specialized basic subjects and specialized subjects.	Flexible, early specialization and modularization developed according to the needs of students, technology advancement & society expectations MTA.
Content and Materials	Theoretical, academic. Textbook only. Ratio of theory/practice: 7/3.	Practical, vocational-based CBE. Integrated (comprehensive) materials and media. Ratio of theory/practice: 5:5/4:6.
Teaching Methods and Teaching Aids	70% class teaching (lecture), 30% lab experiment, field practice, and internships.	50-60% class teaching (lecture, discussion, project work), 40-50% lab experiment, field trips, practice and longer internships. Multi media aids used.
Evaluation	Written exams, assignments, and class performance.	Oral, written, practical exams, class performance, assignments, and national standardized skills testing system.

Under the new policy framework, schools have gained autonomy in introducing new courses and subjects. At the same time, schools still need to obtain approval from a higher authority (usually provincial and prefecture agricultural departments or educational departments) before actual implementation. As a result, a number of new specialties and courses, such as computer applications in agriculture, food processing, agro-business management, gardening and landscape architecture, rural and agricultural economics, animal nutrition and health care and rural recreation and tourism, have been introduced into agricultural schools. There were 130 specialties in 1998 compared to only 40 in

1984 in all 360 agricultural schools (Weng, 1998). To meet the diverse student needs and create new employment opportunities, new courses were developed and the content of the existing courses was modified. In addition, schools started to improve conditions for developing student practical skills by building more practical laboratories both inside and outside school. Also the relationship between agricultural schools and industry was strengthened for the purpose of practical training and internship programs.

From theoretical knowledge-based to practical skill-based ability. All agricultural schools have had the same three components of curriculum structure (basic, basic specialized

and specialized subject) since the late 1970s. The proportion taught from each group of subjects is relatively fixed, 30-40 percent in basic subjects, 50-60 percent in basic specialized and specialized subjects, and 15-20 percent in optional subjects. Given these percentages, it is apparent that the basic subjects still account for a large amount of instructional time.

In recent years, the ratio of theory and practical information established for vocational subjects has been changed from 7:3 to 5:5 or 4:6. Directives by higher authorities have made it clear that the theoretical information should be used to help students master practical skills. Advanced technology and modern practices in agriculture should also be incorporated into the curricula (Ministry of Agriculture, 1997). In addition, teachers are required to allocate 40-60% of instructional time for specialized subjects for practical training. Learning by doing is emphasized at all subjects. There are three forms of experiential learning including laboratory experiments, school farms, and field practice on research and extension stations, government farms, or with herdsman (Diamond, 1999). Furthermore, the traditional internship has been strengthened. The duration of the internship has been expanded from one semester to one year. Now the internship has become an important component of practical instruction as well as a way for students to learn about employment opportunities in the marketplace.

The major approach of student assessment in the past was through written exams that primarily tested the students' memory. Since 1990, agricultural schools have developed practical tests both for specialized and basic subjects. Students now not only need to take a written exam but also they need to show the proficiency of practical skills gained in the course.

Another significant change is the awarding of certificates. All schools now have adopted a "multiple certificate policy." In this system, students will be granted a degree certificate and also a certificate that specifies criteria set by business and industries.

From content-based to competency-based education. A number of efforts have been made to learn from educational systems outside China. Under the guidelines and support of the Ministry of Education (MOE) and the MOA, since early the 1990s agricultural schools have made efforts to reform their curricula. Several

different models, such as Development A Curriculum (DACUM), Competency-Based Education (CBE), and the Modular Teaching Approach (MTA), have been tried and integrated into the curriculum development process.

In 1992, MOE introduced the DACUM system from Canada. Although the innovator schools had difficulty using this system, it was generally agreed that much was learned from this experience and the practice had been considered worthwhile. A key finding was that successful application of the DACUM approach needed to be built on adequate resources and qualified teachers (Weng, 1998).

During 1994-1998, the Food and Agricultural Organization of the United Nations (FAO) sponsored a pilot project—*Strengthening Agricultural Education in Northwest China*. The project proposed by MOA was intended to introduce reforms into agricultural schools in northwest China's poverty-stricken regions. The goal of the project was to create six model schools to reform their educational system from a teacher-centered and passive-learning system to a student-centered active-learning system using a modified curriculum (Diamond, 1999). A Competency-Based Education (CBE) and Modular Teaching Approach (MTA) were taught at all of the pilot schools (Bruening, 1997). CBE is an educational system, in which students learn to be experts in performing relevant skills and tasks for specific occupations. In this system, skills for various occupations are identified, verified, prioritized, and taught using the CBE approach, learning-by-doing (Diamond, 1999).

After all the teaching and practice in project schools and systematic evaluation of the pilot project, the MOA decided to expand the results to other agricultural schools. The ministry believed that CBE and MTA could be useful tools to help develop the Chinese agricultural vocational educational system. Eighteen agricultural schools throughout the country were selected as exemplary schools to try CBE and MTA in one program area in each school, starting from fall semester 1996. From 1996 to 2000, MOA held workshops annually to discuss all issues regarding the implementation and use of CBE and MTA. One of the benefits of the workshops was the results were disseminated through the participants from both exemplary and non-exemplary schools. This reform practice in non-exemplary schools was

guided by MOA officials and policy statements. Typically non-exemplary schools sent their teachers to exemplary schools for training, or exchanged course syllabi, curricular, and teaching materials with exemplary schools.

From teacher-centered to student-centered. In the past, the curriculum was fixed and ossified. It was teacher-centered and information-transfer teaching methodology (lecture) was extensively used. With the training launched by FAO project, the teaching approaches today used are getting more diversified and relevant to teaching and learning objectives. Teaching methods such as discussion, project work, case study, and field investigation are frequently used in teaching. Increasingly, quality teaching is evaluated based on student involvement in learning. At the same time, to advocate student-centered instruction, most exemplary schools have made the use of different teaching methods as one condition needed to meet for teacher promotion and evaluation of teaching quality.

From elite domination to mass participatory process. With decentralization of the education system, schools can try different strategies in response to the needs of students and development of the local economy. Two common approaches have been adopted in course development. One approach is the use of situational analysis when introducing new programs and courses. Investigations, discussions, workshops, and seminars are often organized to increase the consultation with local industry groups to determine educational goals, course content and skill development needs. To sustain this effort, a "local specialty committee" is formed consisting of five to seven people--with two or three from industry, one from a research institution, one from the extension center, and one from the school for each specialty area during the course development and implementation. The purpose of local specialty committee is to increase inputs from a wide range of people in the community to review the curriculum and to ensure the relevance of course content and teaching practice.

Another significant change is that schools and teachers now have a greater role to play in the process of developing curriculum. Teachers now have more freedom to put their personal initiatives into curriculum development. They can adjust the content from

official textbooks and use the materials collected or edited from other sources in teaching. For the textbooks teachers also can choose among different authors and publishers on the market. Inputs for curriculum development are drawn from all individuals involved and interested in agricultural education. Schools have a right to decide the type of program and the subject they want to run, and they become organizer and developer rather than implementer in the process of curriculum development. A few elite and high authorities no longer dominate the process.

Implications and Recommendations

Policies needed to strengthen in-service training

For many Chinese teachers in the past, curricula was viewed merely a list of course contents plus a textbook. The expansive western idea about curriculum is novel to most Chinese teachers. In most cases, Chinese curriculum doesn't deal with the issues of objectives, teaching methodology, and learning activities (Shao, 1997).

Teachers need to play a greater role in education and revitalizing education (Ashmore and Cao, 1997). The attitude and knowledge of teachers are particularly important for overall curriculum reform, since their attitude will be crucial in determining the realities of what goes on in the individual classroom. After all, teachers ultimately decide what is taught in the classroom.

To overcome the historic lack of professional development, first, there is a need to have more teacher training with an emphasis on the innovations in curriculum and teaching and learning practice. In-service training schemes need to be both reinforced and scheduled more frequently. In addition, in-service training should be offered in all schools. Teachers should be taught specific strategies both conceptually and practically. In dealing with the curriculum innovation, teachers also should be provided a sense of what initial difficulties they will inevitably encounter. Second, it would be beneficial to involve as many teachers as possible in the process of curriculum planning. By participating in the complete process, teachers can have a better understanding of the need for curricula changes, the rationale behind the new methods, and ownership for the new curriculum. As Kelly (1989) indicated, if educational innovation is to be successful, teachers must understand as well

as believe in it. Moreover, teacher education in agriculture needs to be integrated into higher education in China. Until agricultural education is a part of the system of higher education, all reform efforts in teacher training will be merely be a temporary solution.

Need for involvement of teachers in decision-making

Teachers are the final arbiters in the policies they choose to implement and the leaders they choose to follow. Therefore teachers' knowledge and involvement are extremely important in determining what can or cannot be implemented. As Reed indicates, teachers need to be intimately involved in the conceptualization and direction of the school reform, which means that teacher isolation, often the norm in the profession, must give way to shared decision-making. Teachers need to share what they know with leaders, policymakers, and other teachers. Teacher knowledge needs to be an integral part of the process (Reed, 2000).

In addition, autonomy needs to be given to teachers in order for them to try new innovations. Pasch, Langer, Gardner, Starko and Moody (1995) contend that an empowered teacher has assumed the responsibility to become a designer of instruction and to reflect on teaching practices to improve instruction. Teachers need to have a feeling of self-efficacy, the knowledge that they are in control of their work environment and that they make a difference with students.

Cuban (1993) noticed that the margin of freedom that teachers enjoy in their situational-constrained classroom may be small, but it is significant. Of course, that margin can expand or shrink, depending on whether administrators and policymakers see as their task the cultivation or repression of teachers' capacities to lead both inside and outside the classroom. Therefore, adjusting administrative structure and reducing organizational constraints can expand teachers' autonomy within the classroom, creating even more opportunities for change.

Need for a systematic approach to deal with curriculum and instruction reforms

In the past 10 years, there have been a number of reforms in Chinese agricultural schools. With all of these changes and practices in different aspects, there is still no systematic strategy for curriculum development. One good example is the systematic model that Skillbeck (1984) offers. Skillbeck outlines five main steps in curriculum development: situation analysis, setting aims, planning, implementation, and evaluation. Using a model such as this is valuable, since it provides a basis for curriculum developers to consider how learning can be made more effective and how to shift from teacher-centered to a student-centered learning approach.

Need for financial support to implement curriculum changes

Vocational education has been seen as a high-cost education in China. Specific equipment and facilities are required in order to satisfy the need for practical training and "hands on" experience and some schools lack the needed resources to teach effectively (Shao, 1997). Currently, the primary sources of funding for schools are twofold: one from the government and the second from students' tuition and fees. Other possible sources of income are school enterprises and provision of services, which are usually of limited value. With the governments' decreasing investment each year, the annual budget for schools tends to rely more and more on the students' tuition fees. However agricultural students only need to pay half as much as students in other vocational schools. This policy tends to encourage more students to attend agricultural schools. However, there is no alternative mechanism from government policy to offset the loss of tuition charges. Coupled with poor facilities and limited resources, these factors have made it more difficult for agricultural schools to undertake curricular and teaching method initiatives. One possible solution is to modify financial policies so that additional resources can be awarded schools that adopt curricular and teaching method initiatives.

Major shifts in education are difficult to achieve, and usually are a lengthy process (Taylor, 2000). This is especially true in China since education grew out of the Confucian tradition (Agelasto, 1996). Therefore, traditional

teaching approaches can be difficult to change, since most believe that teachers “teach the way they were taught.” In order to make the needed changes in curriculum and teaching methods, teachers will need to be actively engaged, supported through financial resources, and will need sustained administrative support.

Conclusion

In response to the reform and development of the nation’s economy and agriculture, policies have been launched to change the educational system and to introduce vocational elements into Chinese agricultural schools. Decentralized policy initiatives and approaches in curriculum development are major features of this effort. The new approaches applied are more open and dynamic. The implementation is more flexible and relevant in terms of the students’ needs and in meeting the workforce needs of the market-based economy. The planning process, curriculum structure, teaching methods, and the evaluation approach are undergoing a number of changes and adjustment in Chinese agricultural schools.

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