

AGRICULTURAL-BASED CURRICULUM: A COMPARATIVE STUDY

Azman Bin Abd. Ghani
Hanim Bt. Rithuwan
Mariati Bt. Abdullah
Siti Meriam Bt. Ismail
University of Malaya
mahir_aag@yahoo.com.my
naneem05@yahoo.co.uk
mariati_abdullah@yahoo.com
yam_jam64@yahoo.com

This paper will report and propose an agricultural based curriculum and to build an agricultural based school in Malaysia. Data were collected by document analysis from four schools; i.e., Ohio; United States; Agricultural High School, Sydney, Australia; Farm School, Massachusetts; and Agricultural School, Cerrito, Paraguay. The information gained was analyzed by comparative document analysis. The strengths and weaknesses were reviewed and the analysis shows that the curriculum and programs implemented in those schools are suitable for implementation in our school. In aspect with new agriculture skills, this study demonstrates that the contents of the subjects are applicable, adequate, and fulfill the school learning's requirements and environment here in Malaysia. This study indicated that student will gain new practical practices and knowledge in order to boost up their new skills and techniques as preparation for further academic learning. Furthermore, our country has various advantages such as climate, weather, rain and also unexplored land. Our findings revealed that the curriculum from the above mentioned schools can be implemented here with some improvisation in the existing curriculum. In addition we also proposed a fully agricultural based school curriculum which can be used for the ministry and the beneficial stakeholders. We hope the findings in this analysis would lead to a new paradigm shift towards agricultural curriculum in our country.

Keyword: Document analysis, agricultural-based curriculum, improvisation, paradigm shift

First, it was diesel and gasoline. Then, came sugar, cooking oil, flour and now rice. This is a global food crisis story. At first glance, we Malaysians hardly agree with it. Then it came. Shortage came after shortage of essential items. Finally earlier in 2008, the new Malaysian Cabinet admitted that the Global Food crisis may also hit this little country, albeit on a smaller scale. Almost all of a sudden the world was shocked with news of food-related riots in many parts of the developing world, due to the rise in prices of staple foods like rice and wheat and shortages in the market. The food crisis is now rivalling the financial crisis and climate change as the most important problem the world has to solve. It is the most pressing, because people cannot go a few days without food, and because hungry people are showing their anger and desperation on the streets

An understanding of agriculture is important for every citizen. Every person has a vested interest in agriculture. The economic well being of our society is dependent on agriculture to supply an inexpensive, safe and abundant food supply. One of the purposes of agriculture education is to inform students about the industry which is so vital to our future. Agricultural literacy is important to every consumer as well as to those planning a career in agriculture. Dependence on agriculture knows no boundaries. Urban and rural, wealthy or poor, white collar and blue collar, young and old, developed nation or developing nation, any culture, or any race; no matter how people are classified, agriculture is the lifeline that supports them all.

Agricultural Sector Development in the Ninth Malaysian Plan (RMK- 9)

The agriculture sector registered favourable growth during the Eighth Malaysia Plan period. Export earnings of the sector expanded significantly due to the increase in export volume and better prices of agricultural industrial commodities. The sector continued to provide the raw materials required by the domestic agro-based industries and part of the nation's food demand.

The agriculture sector is expected to grow at a higher average annual rate of 5.0 per cent. With the inclusion of the agro-based industry, the growth rate is expected to be 5.2 per cent. During the ninth Plan period, the overall policy thrusts of the agriculture sector will focus on its reorientation towards greater commercialization and the creation of high-income farmers as well as promotion of greater private sector investment including foreign investment. In this regard, the policy thrusts will be as follows: increasing agricultural production including by venturing into new sources of growth with greater private sector participation; expanding agro-based processing activities and product diversification; strengthening marketing and global networking; enhancing incomes of smallholders, farmers and fishermen; and improving the service delivery system.

In line with the new emphasis on agriculture and its contribution to economic growth, a total allocation of RM11.4 billion will be provided to implement various agricultural programs and projects. This represents an additional amount of RM4.7 billion or 70.0 per cent higher than the allocation provided in the Eighth Plan. A total of RM4.4 billion will be allocated for the modernization of agriculture, mainly for projects in the regional development areas, as well as replanting and land consolidation and rehabilitation programs while another RM2.6 billion is allocated for support services and RM1.5 billion for agricultural irrigation programs. Hopefully this new agricultural approach will trigger the agriculture industrial current in our 9th Malaysia Plan.

This revolution would be able to encourage the agricultural sector and make it as one of the nation's generator for economic growth. Within this Ninth Malaysia Plan, the agricultural sector is about to achieve the first mission under the Plan, that is to increase the value added in the country's economy. The task of this agricultural sector shows that this sector is equal to the other economic sectors such as manufacturing and services. This mean that the agricultural sector in the Ninth Malaysia Plan must be developed, dynamic and viable to compete as outlined under the Third National Agriculture Policy. The Plan will be implemented through new agricultural industrial targets on basic fundamentals as follows:

- a. Increase the agriculture production including the new growth resource
- b. Exploitation with bigger private sector participation
- c. Expand the agriculture-based processing activity and product diversification
- d. Strengthen marketing and global network
- e. Increase the income of smallholders, farmers and fishermen; and
- f. Improve the delivery system service.

Programs and development projects such as increasing the production area for agro-food and to enhance agro-based industry will be implemented in Ninth Malaysia Plan.

Definition of Curriculum

Tyler (1949) suggested that the ideal objective of education is "a process of changing the behaviour patterns of people" (p. 5). Doll (1996) defined curriculum as "the formal and informal content and process by which learners gain knowledge and understanding, develop skills, and alter attitudes, appreciations, and values under the auspices of that school" (p. 15), while Tanner (1980) regarded curriculum as "The planned and guided learning experiences and intended learning outcomes, formulated through the systematic reconstruction of knowledge and experiences, under the auspices of the school, for the learners' continuous and willful growth in personal social competence." Based on these definitions, this study attempts to propose an agriculture-based curriculum to fulfil the needs to improvise the local agriculture curriculum development.

Purpose of the Study

This study will propose some improvisation in the existing curriculum and suggest to the Ministry of Education (MOE) and related organizations to build a fully agricultural based school curriculum which can be used for the ministry and the beneficial stakeholders.

Specific Objectives

This study has the following objectives:

- a. To analyze the four schools which are implementing the agricultural-based curriculum around the world.
- b. To focus on the implementation of agriculture-based curriculum in those schools.
- c. To recommend improvisation in the existing agricultural curriculum in Malaysian schools.
- d. To propose on establishing a fully agricultural based school in Malaysia.

Research Questions

The research questions to be answered are:

- a. Which schools could be taken as the pioneers in establishing an agricultural school?
- b. In what manner the is the agricultural-based curriculum to be implemented in those schools?
- c. What are the recommendations to improvise the current agricultural curriculum in schools?
- d. What are the requirements to establish a fully agricultural-based school?

Methodology

This paper was based on the analysis and comparison was made by the researchers through the document on the Internet. Data were collected by document analysis from four schools; i.e., Farm School in Ohio, United States; Agricultural High School, Sydney, Australia; Farm School, Massachusetts; and Agricultural School, Cerrito, Paraguay. The information gained were analyzed by comparative document analysis.

Results

Document analysis from the above mentioned four schools, indicates several aspects regarding the curriculum and programs; philosophy, vision, purpose and objectives are discussed in this section.

Agriculture Education Program Philosophy

As a part of the overall educational program, an agriculture-based curriculum education is designed to provide students with competencies to make them aware of and prepared for the world of work. Agriculture is a dynamic, rapidly changing industry that has an exciting future. The "new agriculture" consists of the intriguing new frontiers of biotechnology. While the primary thrust of the program is for those students who are preparing for employment in agricultural occupations requiring less than a

baccalaureate degree, agricultural education has a long tradition of preparing students who continue their education in agriculture at the postsecondary level. The program concentrates on developing essential technical skills vital to the success of people entering a career in agriculture. Just as important as the technical skills are the skills developed in leadership through the comprehensive nature of the program. Since its inception, agricultural education has trained youth in the skills necessary to assume leadership positions in agriculture. As agriculture addresses controversial issues such as genetic engineering, leadership training takes on increasing importance among our youth. People will be needed who not only have an understanding of the technical aspects of the issues, but who also have an understanding of the ethical and philosophical issues.

Agriculture Education Vision Statement

1. Agricultural Awareness - To deliver a literacy and appreciation program that enhances public understanding of agriculture and the environment
2. Biotechnology - To interpret, communicate and encourage the proper application of biotechnology
3. Curriculum - To develop and provide a functional and challenging curriculum utilizing state of the art equipment, facilities and technology
4. Environmental - To develop awareness, appreciation and application of environmental stewardship
5. Global Agriculture - To foster global understanding and relationships through learning experiences in agricultural and environmental education
6. Leadership - To provide a dynamic leadership program through communication, citizenship and cooperative activities
7. Lifelong Learning - To provide lifelong agricultural learning experiences
8. Marketing - To promote the value of agricultural education and implement marketing strategies for each of our target groups
9. Partnerships - To develop a mutually beneficial educational network
10. Recruitment - To develop and implement systems for recruiting and retaining quality teachers and students
11. Technology - To enhance the utilization of advanced and emerging technologies

Purpose and Objectives

The purpose of the agricultural curriculum education program is to explore and stimulate interest in the world of work in the agricultural industry through prescribed classroom and laboratory experiences designed for basic understanding, introductory skill development, agricultural literacy and personal development. Specific Objectives of the Agriculture School Education Programs are to:

- a. Provide background knowledge, understanding and abilities useful in helping students make decision.
- b. Develop personal attributes, attitudes and knowledge toward becoming a contributing member of society.

- c. Stimulate interest and provide opportunities to acquire basic knowledge of and explore skills in such areas as agricultural research, forestry and natural resources, horticulture, and the plant and animal sciences.
- d. Provide a setting for applying instruction in academic disciplines.
- e. Provide a basis for student selection of one or more career areas for further study at the high school and collegiate level.
- f. Develop agricultural and environmental literacy skills for all students for their benefit as consumers and citizens.

Agricultural and Environmental Literacy

Agricultural education is broader than vocational agriculture. Education about agriculture — *agricultural and environmental literacy* — is an important part of a comprehensive agricultural education program at the middle school and high school levels. Students enrolled in grades 6-8 should have the opportunity to learn about the food, fiber and environmental systems and their economic, social and environmental significance. Much of the instruction is designed for those students who are not involved in or pursuing careers in the agriculture industry.

Curriculum for Agriculture School Programs

Detailed curriculum and instructional materials in agriculture education have been developed. These include the Curriculum Framework and instructional guides for each of the middle school grades.

Curriculum Consistency

Historically, the agricultural education program was based on local needs due to the diversity of agriculture and the fact that most people did not move far from their home community for employment. Consequently, there was very little consistency in the agriculture education curriculum content and content organization in the state. Success in modern agriculture and agribusiness requires a knowledge of global agriculture. The world market affects every product, service and business. With increased emphasis on state, national and international agriculture, it is advantageous to have a more consistent curriculum across the country. Local systems are encouraged to adopt the new curriculum and localize it as necessary to accommodate specific local agricultural needs.

Curriculum Framework

The outline of the curriculum is an attempt to make the agriculture school curriculum more consistent. The curriculum also guides teachers to include the most important content in their programs, as well as the most appropriate grade and age level at which to teach the content. The curriculum content was selected and sequenced for appropriate grade level by the school curriculum committee. It is suggested that this curriculum be used as a basis for instruction in the local school. However, it is recognized that no one curriculum will fit every school and situation. The teacher, advisory committee, and local administration must develop the curriculum for their particular situation.

The approved curriculum then followed with principles to guide school personnel in establishing new agricultural school programs or in renewing current programs.

- The curriculum should be designed so that there are no prerequisites to the courses.
- Lab facilities should be provided for supervised practice.
- Personal development and leadership education should be an integral part of the curriculum at each grade level.
- Hands-on learning is a highly desirable methodology for this age student and should be used where possible.
- Team building activities should be emphasized.

- All agricultural careers should be explored, including jobs in new and emerging technologies.
- Agricultural and environmental literacy should be a major objective of the program.

Organization of Program

The agricultural school education also organizes an agricultural program. The program is organized to complement the existing academic curriculum. A three year program is suggested. Suggested courses and grades are: 6th grade - Introduction to Agriculture – 9 to 18 weeks; 7th grade- Exploring Agriculture -- 9 to 18 weeks; 8th grade - Agricultural Careers Development – 1 year.

Sixth and seventh grade classes in agricultural education have traditionally been six, nine or eighteen weeks long. Eighth grade agricultural education classes have been from nine weeks up to one year in length. It is recommended that middle school agriculture consist of at least nine weeks of study in the sixth and seventh grades or approximately 45 hours. The eighth grade program should be one year (180 hours) in length, but a minimum of one semester (90 hours). It is understood that local situations vary and these minimum recommended times may not be practical in all schools. The program lengths listed here are suggestions.

In the sixth and seventh grades, students are exposed to broad career areas and learn about the food, fiber, and environmental systems. Students are introduced to these career areas through selected lessons and hands-on activities related to those careers.

In the eighth grade, students receive more in-depth exploratory experiences in specific occupational fields. As a result of their experiences in sixth and seventh grades, students begin to make tentative choices of career options in terms of their interests and abilities. During the eighth grade, it is suggested that students be given the opportunity to expand their interests in agriculture by taking a course for one full year. This allows for more focused planning with the student's individual needs and career objectives. The eighth grade curriculum should be expanded horizontally and vertically to keep pace with the students' expanding physical and mental capacity to study more in-depth, as well as to allow the student to continue to explore new career opportunities in agriculture. The curriculum guide provides the basis for the year-long eighth grade course. The teachers should expand the curriculum, as needed, with more activities and in-depth study of the subjects.

In the eighth grade, students may select several occupational families, which are related to the areas of interest initially investigated during the sixth and seventh grades. Learning activities should be provided which emphasize "hands-on" experiences in realistic or simulated work environments. Activities such as constructing small wood or metal projects, distributing and selling a product, or landscaping a portion of the school campus enables students to examine various work roles and acquire manipulative skills and knowledge related to the occupational area. The subject areas of mathematics, science, social studies and English should be integrated with the learning activities of the program. The year-long program in the eighth grade allows time for students to select a single occupational area for in-depth investigation and exploration. The study of occupations enable students to further develop attitudes, skills and knowledge needed to make tentative career decisions.

The success of a career exploration program depends upon the cooperation and support of the local community, school administration and teachers. Provisions should be made for business leaders in the community to participate in the agricultural school program through an advisory committee. The middle school agriculture program, when implemented as outlined, should provide a method whereby all students may:

- be introduced to a wide range of career opportunities
- become informed consumers
- participate in personal development and leadership activities
- develop agricultural and environmental literacy skills

Recommendations

Recommendations are based on the document analysis and consists of two different parts.

Improvisation in the Existing Curriculum

An agricultural-based curriculum should provide an orientation to and background understanding of the global agricultural industry and career opportunities in the industry. The course content and program should provide core learning for future development and refinement. It is highly desirable and recommended that our curriculum provide students with hands-on activities to supplement classroom learning as a basis for choosing or rejecting a possible career area. Agricultural education should emphasize more on hands-on activities, because real life experiences are fun, and motivate students to learn. Moreover agricultural education also can enhance learning in other subject areas by applying academic concepts to real-life, hands-on activities. This is so significant to be improvised in our existing curriculum because whenever students wanted to pursue their study in higher institutions or finish their school days, the experiences they have had in agricultural education, as well as in other exploratory classes, will help them focus on a career area and begin to plan their educational goals.

It is suggested that laboratory experiences or hands-on activities should consume a significant portion of the time allotted for each instructional area. Hands-on laboratory experiences supplement classroom activities by giving students an opportunity to experience what it is like to work in agricultural occupations. Exploration of careers assists students in making tentative career choices. Students must be provided opportunities to investigate occupations. Students must be provided with opportunities to investigate occupations in a variety of ways including individual, small group, and large group activities. Therefore the agricultural-based curriculum should comprise distinct yet interrelated components. A basic component is classroom and laboratory experiences. In the classroom, students learn concepts and theories dealing with a broad spectrum of agricultural and agribusiness topics. The classroom is followed by the laboratory mode of instruction where concepts and theories are carried through to their application. Here, the students are taught "hands-on" skills that ensure that the skills learned are practical and usable. Agriculture education addresses important, real-world topics that interest middle grade students: plants, animals, the environment, mechanics and careers. In addition this new improvised agriculture education curriculum may be implemented at the local level in (1) school systems where no agriculture programs are currently conducted; (2) school systems which now offer an agriculture program at the high school level; or (3) in systems which have middle school programs which need to be revised, modified or expanded.

A Fully Agricultural-Based School

This paper would recommend a fully agricultural-based school to be built in Malaysia in conjunction with Ninth Malaysia Plan (RMK-9). With the development of a new curriculum and a fully agricultural-based school, gifted and talented students should be taken into account to enroll in such a school. This suggestion is in line with the National Biotechnology Policy, whereby the application of biotechnology to agriculture will be further promoted and intensified to harness the potentials of the agriculture sector in creating new wealth. To accelerate R&D activities in biotechnology, research institutions including institutions of higher education will be equipped with the requisite facilities and equipment; talented and gifted youngsters should thus take up the challenge. In addition, public researchers will be trained in the field of advanced biotechnology including biodiversity through attachment programs and greater collaboration with the private sector.

Since most students lack extensive experiences in agriculture at home, the school should provide land and laboratory facilities. Facilities may include an agricultural mechanics laboratory, greenhouse, nursery, small and large animal facility, aquaculture unit and agriscience laboratory. Exact facilities will depend on needs and resources of the local community. For example, an urban school may emphasize horticulture and plant science while a rural school may emphasize animal science. Classroom study of agriculture develops an understanding of the food, fiber and environmental systems. Agriculture teachers would strive to reinforce basic academic skills in

classroom activities by demonstrating the application of those skills to the world of work. Classroom work is supplemented and reinforced by laboratory activities.

Career exploration curriculum will be included in the school and one of the purposes is to make students aware of the broad career opportunities in the agricultural industry by giving them basic knowledge and experiences. They are encouraged to begin setting career goals and to develop tentative plans to accomplish those goals. Plans for accomplishing career goals in agriculture may include continuing the study of agriculture and agriscience in a high school program, concentrating coursework in the sciences such as chemistry and biology, and post-secondary study at a college, university or technical institute. Agricultural-based education in this school is organized in such a way that it cuts across subject-matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study. It views learning and teaching in a holistic way and reflects the real world, which is interactive.

Conclusion

This document analysis shows that the curriculum and programs implemented in those schools are suitable for implementation in our school. Regarding new agriculture skills, this study demonstrates that the contents of the subjects are applicable, adequate, and fulfill the school learning requirements and environment here in Malaysia. This study indicated that student will gain new practical practices and knowledge in order to boost their new skills and techniques as preparation for further academic learning. Furthermore, our country has various advantages such as climate, weather, rain and also unexplored land. Our findings revealed that the curriculum from the above mentioned school can be implemented here with some improvisation in the existed curriculum. We hope the findings in this analysis would lead to a new paradigm shift towards agricultural curriculum in our country. The main target in the production development of agro food and side processing under the Ninth Malaysia Plan is to increase the farmer group, commercial and modern farmer and fisherman, as well as agro entrepreneurs to lead the development of private sector driven agro food industry, without neglecting the traditional farmer, where their capacity and production capacity will be enhanced so that they can be absorbed in this transformation process, and consequently, boost their productivity and income. The implementation of this 9th Malaysia Plan is parallel with the hope of the nation's highest leader to revolutionize and industrialize this agricultural sector to make it more modern, dynamic, viable and competitive at all levels.

References

- Burton, L. DeVere. (1998) *Agriscience & technology*. Albany, NY: Delmar.
- Chelewski, Ray E. (2004) *AgriScience Explorations* (3rd ed.). Prentice Hall.
- Georgia Department of Education. *Curriculum framework for agricultural education in Georgia: Curriculum Guide, State Agricultural Education Curriculum Office: Athens, GA: Author.*
- Georgia Department of Education. *Middle school biotechnology in agricultural education: Grade 6. Instructional Guide, State Agricultural Education Curriculum Office: Athens, GA.*
- Herren, R. V. (2002) *Exploring agriscience*. Albany, NY: Delmar.
- Tanner, D., & Tanner, L. (1995). *Curriculum development: Theory into practice*. New Jersey: Prentice Hall.
- Tyler, R. W. (1949). *Basic principles of curriculum and instruction*. Chicago: University of Chicago Press.

Stillwater, O. K. (1990). *Introduction to agricultural product and processing*, Curriculum

“Hershey Montessori Farm School”. Retrieved January 10, 2008, from <http://www.hershey Montessori.pvt.k12.oh.us>

“San Fransisco Farm School” Retrived on February 2, 2008, from <http://www.fundacionparaguaya.org.py/index.php?c=208&i=2>

“James Ruse Agriculture High School” Retrieved January 17, 2008, from <http://www.jamesruse.nsw.edu.au>.

“Farm School Massachussets” Retrieved on February 2, 2008, from http://www.farmschool.org/prog_summer.html.