

A Foundational Study of the Structure of Primary Natural Science Curriculum in Macao

Abstract

Primary natural science curriculum in Macao all along used teaching materials produced in Hong Kong and, as a result, lacks local characteristics. Official localized curriculum first appeared when the educational governing bodies in Macao published the first natural science curriculum in 1996. Although the curriculum was revised in June of 1999, an analysis of its content structure still showed a clear lack of detailed research into subject content, experiences from other advanced countries or regions were seldom referenced; these factors all contributed to the lack of futuristic curriculum content, rather lose structure, and resulted in students may not be able to learn the essential intellectual and emotional abilities that were the essence of natural science education.

The purpose of this research is to vertically coordinate the mainstream natural science teaching materials within the field of primary school general studies and the primary natural science curriculum published by the Education and Youth Affairs Department of Macao in June of 1996 and subsequently revised in 1999, and horizontally compare primary science curriculum and teaching materials in advanced countries and regions of the world, in order to explore the best possible strategy to arrange natural science curriculum contents within the field of primary school general studies in Macao, and to raise constructive suggestions on how to build the content structure of primary natural science curriculum in Macao.

The research uses comparative studies and in-depth discussion with teachers as the main research methods. A review of existing literatures first exposed the nature

and connotation of science education, and according to literatures describes the development of nature science curriculum in the United States, Japan, United Kingdom, China, China Taiwan, China Hong Kong, etc., and theoretically analysis the developmental trends in contemporary science teaching materials. A comparison of primary school curriculum standards, regulations and main contents in Macao, United States, Japan, United Kingdom, China, China Taiwan and China Hong Kong was made to further analysis relevant scientific concepts, and after considering the analysis of this research and references provided by general studies teachers in Macao, suggestions to advance the structure of natural science curriculum were raised.

The research showed that:

1. The overall direction of the existing curriculum published by the Education and Youth Affairs Department was clear, but the content structure can still be improved.
2. The existing natural science teaching materials being used primary schools failed to supplement the unique pluralistic social characteristics in Macao.
3. Teachers were narrowly focused in meeting the teaching schedules, teaching process was often in the form of reading texts from the textbook and rigidly following prescribed teaching plans, exploratory scientific teaching processes were rarely implemented.
4. The arrangement of the curriculum and its contents did not focus on development positive scientific values among students; this may have negative effect on the formation of their future development in the field of science.

The following suggestion were raised after abovementioned research and analysis:

1. To meet the needs of the pluralistic society in Macao, the values in choosing contents within primary science curriculum should be more focused on multi-cultural issues, life-long education and the development of scientific quality.
2. The quality of science education can be enhanced when new science curriculum and teaching materials are developed.
3. Scientific inquiry in science should be used as the underpinning concept for the design of science curriculum, the arrangement of teaching materials and the implementation of teaching activities.
4. Both vertical and horizontal integration concerns have to be addressed whilst designing the overall curriculum, such that the effectiveness of curriculum integration can supplement the content of other general studies subjects.
5. Teaching materials need to be more interesting and closer to real-life situations.