

**THE CULTURE OF LEARNING SCIENCE IN A
SABAH ISLAMIC RELIGIOUS SECONDARY
SCHOOL SCIENCE CLASSROOM**

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THE DEGREE OF DOCTOR OF PHILOSOPHY**

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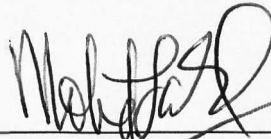
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I, Amnah Abdullah, declare that this thesis, submitted for the requirements for the award of Doctor of Philosophy, in the Faculty of Psychology and Education, University of Malaysia Sabah, is wholly my own work unless otherwise referenced or acknowledged. This thesis has not been submitted for qualifications at any other academic institution. I hereby declare that the work contained in this thesis is my own and has not previously been published, with the exception of the following publication and conference presentations found in the last page of this thesis.

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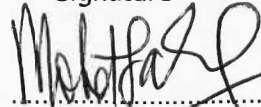
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Amnah Abdullah
30 September 2019



ABSTRACT

The aim of this study was to explore in-depth i.e. to describe, to explain, to understand, and *verstehen*, the culture of learning science in the classroom of a religious secondary school. I used interpretive paradigm philosophy, with ethnography methodology. My methods used to obtain the data of informants in their natural setting were essentially fieldnotes, observations, and interviews. Supporting materials i.e. visual materials, documents were also used. The themes discovered in this study were priority, value-laden, and inequities. I found that culture did influence the learning of science, but the achievement of students was much related to inequities and not culture. On the contrary, the components of culture in this study i.e. priority and value-laden enhanced and motivated the students to be psychologically stable in their duties as a student fulfilling three of the four national philosophy of education components i.e. spiritually, emotionally, and physically. However, inequities had made fulfilling the component intellectually unachievable. I discovered that my informants lacked the cognitive apprenticeship needed to be a future member of the scientific enterprise. In Sabahan context, the relationship between Reading Qur'an, Rote Learning, and Respect Elders was uncovered. This relationship was within the Sociocultural Theory incorporating the two levels i.e. social level and individual level. I presented through conference the proposed expanded theoretical framework leading to the value of putting the lens on the subculture learner in order to understand the end user of the curriculum (i.e. the students). The practice of classroom ethnography in the understanding of minority groups in Sabah context was also argued in my discourse. This study fulfilled the decentralization of the reformed education system where states, districts could identify needs and find customized solutions to their customized needs related to their environment and culture. This research is expected to provide a sharing of information that could be used by the district, state, and MOE if it was relevant to be implemented. Finally, the implementation and further study could be conducted on students in different classes. Future studies could also be conducted using an intervention design of an integrated model cultural knowledge-science knowledge to test the effectiveness of teaching students using an integrated curriculum in the goal of improving the achievement rate of secondary students in minority religious schools.



ABSTRAK

BUDAYA PEMBELAJARAN SAINS DALAM BILIK DARJAH SAINS SEKOLAH MENENGAH AGAMA DI SABAH

Tujuan kajian ini adalah untuk meneroka secara mendalam budaya pembelajaran sains sebuah kelas di sekolah menengah agama iaitu dengan cara menerangkan, menjelaskan, memahami, dan verstehen. Saya menggunakan paradigma interpretif, dengan metodologi etnografi. Data-data daripada informan diperolehi dalam persekitaran semulajadi melalui kaedah-kaedah seperti nota lapangan, pemerhatian, dan wawancara. Bahan sokongan yang digunakan termasuklah bahan visual dan dokumen. Tema-tema yang ditemui daripada analisis data yang dijalankan ialah keutamaan, sarat nilai, dan ketidakseimbangan. Saya mendapati bahawa budaya mempengaruhi pembelajaran sains tetapi pencapaian pelajar pula bergantung kepada ketidakseimbangan dan bukannya budaya. Sebaliknya, komponen budaya iaitu keutamaan dan sarat-nilai didapati dapat meningkatkan dan memotivasikan pelajar menjadi stabil secara psikologi dalam tugas mereka. Sekaligus memenuhi tiga daripada empat komponen dalam Falsafah Pendidikan Kebangsaan iaitu rohani, emosi, dan fizikal. Walau bagaimanapun, ketidakseimbangan telah menyukarkan pencapaian intelektual pelajar-pelajar. Saya mendapati para pelajar tidak mempunyai perantisan kognitif yang diperlukan untuk menjadi ahli saintis pada masa depan. Dalam konteks negeri Sabah, didapati terdapatnya juga hubungan antara membaca Al-Quran, menghafal, dan menghormati orang lebih tua daripada mereka. Hubungan atau kaitan ini telah mengesahkan teori sosiobudaya yang menggabungkan kedua-dua tahap sosial dan tahap individu. Saya telah mengusulkan dalam suatu persidangan untuk mengembangkan kerangka teori dengan meletakkan fokus kepada cabang budaya pelajar agar dapat difahami bahawa pengguna terakhir kurikulum ialah pelajar. Amalan etnografi dalam kelas bertujuan memahami kumpulan minoriti di dalam konteks negeri Sabah juga dibahaskan dalam penulisan saya. Kajian ini memenuhi desentralisasi sistem pendidikan yang berpusat iaitu dari negeri ke daerah yang membantu mengenal-pasti keperluan semasa dan mencari penyelesaian yang disesuaikan dengan keperluan khusus kepada mereka yang berkaitan, yang memenuhi kehendak persekitaran dan budaya mereka. Penyelidikan ini diharap dapat memberikan perkongsian maklumat yang boleh digunakan oleh Pejabat Pendidikan Daerah, Jabatan Pendidikan Negeri, dan Kementerian Pendidikan Malaysia jika relevan untuk dilaksanakan. Akhirnya, pelaksanaan dan kajian lanjutan boleh dilakukan pada pelajar dalam kelas yang berlainan. Kajian lanjutan juga boleh dilakukan dengan menggunakan reka bentuk intervensi, model bersepadu pengetahuan budaya-pengetahuan saintifik untuk menguji keberkesanan mengajar pelajar menggunakan kurikulum bersepadu. Ini bertujuan meningkatkan kadar pencapaian pelajar menengah di sekolah agama minoriti.



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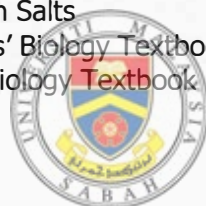


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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

In Malaysia, there is a growing number of Islamic religious schools designed for children of the Muslim community (Siren, 2013). Studies (Hashim & Langgulung, 2008; Yaacob et al., 2014b) have shown that one of the reasons why parents choose religiously-defined schools was because parents were concerned about their children morals, values, religion, family and character development. Before Malaysia's independence, the 1950 Barnes Report stated that most Malaysian Muslim parents would send their children to national schools in one part of the day, then send their children to religious schools in the latter part of the day (Hashim & Langgulung, 2008). Sixty nine years later, this practice continued (Hashim & Langgulung, 2008).

Generally, there are various types of religious schools controlled by the Malaysian federal and state government. These schools are the Religious National Secondary School (SMKA, Sekolah Menengah Kebangsaan Agama) and Religious National Secondary Boarding School (SABK, Sekolah Agama Berasrama Kebangsaan) controlled by the State Ministry of Education. The state religious schools (SMAN, Sekolah Menengah Agama Negeri or SAN Sekolah Agama Negeri) controlled by each respective state. The Public Religious School (SAR, Sekolah Agama Rakyat) established by the local community or individuals and controlled by the State Islamic Affairs Department. The Private Religious Schools (SAS, Sekolah Agama Swasta) established by organisations or companies and monitored by the State Islamic Affairs Department (Hashim & Langgulung, 2008; Siren, 2013).

In 1968, world religions including Islam underwent a crisis of belief and identity that eventually led to Islam being ignored as an historical force by all social critics in the West (Inglis, 2000). Islam, like other world religions, was regarded as a taken-for-granted body of doctrine that was slowly being ignored (Inglis, 2000). When the



concept of globalization leading to the Islamic resurgence (Lee, 2014; Osman et al., 2018) emerged, Malaysia as an Islamic state (Hoffstaedter, 2013) also took part in this Islamic resurgence. Islam is the religion of the federation of Malaysia (Hoffstaedter, 2013). Sensitive to the needs of Muslims (Lee, 2014; Osman et al., 2018), the National Philosophy of Education was also formulated in 1989 and revised in 1996 (Halim & Meerah, 2016) to solve the Muslim dilemma of a value-free education (Baba et al., 2015) lacking in faith and value (Hashim, 2014; Hashim & Langgulung, 2008). Malaysia's educational system was strengthened alongside the NEP (National Education Philosophy) to prepare values-driven human resource to perform at an international level by the year 2025, as required by the Executive Summary of the Malaysian Education Blueprint 2013-2025. Moreover, the first principle of the five National Principles of Malaysia (Rukun Negara) is Belief in God. For the religious schools, each establishment had a choice of implementing either a single religious curriculum or implementing both religious and national curriculum.

For Malaysia, science education is the center stage because it is a key growth area in regard to the economy of the country (MOE, 2013a). It is a compulsory subject in all schools and therefore all schools are to adhere to the same curriculum specifications. At the lower secondary classes (form one, two, and three) science is taught as a single subject. However, on advancing to a higher level (form four and five), the science subject for the science stream classes are separated into biology, physics, and chemistry. The promotion of science for all is accompanied with the goal of science education which is to acquire scientific knowledge in order to commercialize it (Halim & Meerah, 2016). The development of Malaysia's education system was in essence to create local skilled manpower, national unity, then the creation of a developed nation.

In science education, the objective of science curricula is a better understanding of the nature of science (Lederman, 1992). However, concerns that the Malaysian science education was based on overseas product emerged between the year 1961 to 1979 (Kasmo et al., 2015). In fact, some researchers (e.g. Aikenhead & Jegede, 1999; Abd-El-Khalick & Akerson, 2004) have suggested the need to make science curricula a culturally sensitive curricula to avoid cultural clashes with Western science. Lederman (1992: 331) wrote that science curricula can differ greatly among countries, state, school districts, and individual schools. He added that the selection of science topics and/or concepts to be included in a particular country's textbook as

one example. This is clearly seen in the Malaysian biology textbook concerning the omission of Darwin's evolution theory (Osman, 2018). Thus Malaysian's need to understand the nature of science, "science as a way of knowing" (Lederman, 1992: 331).

Moreover, Lee (2000) remarked that in order to have economic growth, high technology requires skilled labour force. In order to fulfil skilled labour force, the learning process requires a process of enculturation, a connection between knowing and doing of a particular skilled labour force (Brown et al., 1989). The term culture of learning as an apprenticeship was first coined by Brown et al. (1989) as a process of enculturation. Driver et al. (1994) in agreement with Brown et al. (1989) suggested that scientific knowledge is socially constructed, validated, and communicated through the process of enculturation. The learner learns to use the tools of the practitioner in the practitioners' authentic activity progressively and actively until the learner builds an implicit understanding of the tools used and the world in which the learner uses these tools (Brown et al., 1989).

Nevertheless, the Malaysian education system was constantly monitored, educational reforms fast tracked and the constant monitoring of the quality of Science, Technology, Engineering and Mathematics (STEM) education. In the science curriculum specifications for form four, the content for biology consists of (1) investigating the cell as a basic unit of living things with learning areas: cell structure and cell organisation, movement of substances across the plasma membrane, chemical composition of the cell, cell division; investigating the physiology of living things with learning areas: nutrition, respiration; (2) investigating the relationship between living things and the environment with learning areas: dynamic ecosystem, endangered ecosystem. The content for chemistry consists of (1) matter around us with learning areas: the structure of the atom, chemical formulae and equations, periodic tables of elements, chemical bonds; (2) interaction between chemicals with learning areas: electrochemistry, acids and bases salts; (3) production and management of manufactured chemicals with learning areas: manufactured substances in industry. The content for physics consists of learning areas: introduction to physics, forces and motion, forces and pressure, heat, light. (Malaysian Curriculum Development Centre, 2005)



In the science curriculum specifications for form five, the content for biology consist of (1) physiology of living things with learning areas: transport, locomotion and support, coordination and response, reproduction and growth; (2) variation and inheritance in living things with learning areas: inheritance, variation. The content for chemistry consists of (1) interaction between chemicals with learning areas: rate of reaction, carbon compounds, oxidation and reduction, thermochemistry; (2) production and management of manufactured chemicals with learning areas: chemicals for consumers. The content for physics consist of waves, electricity, electromagnetism, electronics, and radioactivity (Malaysian Curriculum Development Centre, 2006).

In addition, the science learning experiences mentioned in the Malaysian curriculum specifications is used as a means to inculcate scientific attitudes and noble values in students (Malaysian Curriculum Development Centre, 2005; Malaysian Curriculum Development Centre, 2006). In 1989, the curriculum design integrated the intellectual, spiritual, emotional and physical aspects in the curriculum design (Halim & Meerah, 2016) i.e. the scientific attitudes and noble values expected in all the three science subjects of the form four and form five. There are twenty components in the NEP. The scientific attitudes and noble values instilled in the form four and form five are: Having an interest and curiosity towards the environment; Being honest and accurate in recording and validating data; Being diligent and persevering, Being responsible about the safety of oneself, others, and the environment; Realising that science is a means to understand nature; Appreciating and practising clean and healthy living; Appreciating the balance of nature; Being respectful and well-mannered; Appreciating the contribution of science and technology; Being thankful to God; Having critical and analytical thinking; Being flexible and open-minded; Being kind-hearted and caring; Being objective; Being systematic; Being cooperative; Being fair and just; Daring to try; Thinking rationally; Being confident and independent (Malaysian Curriculum Development Centre, 2005; Malaysian Curriculum Development Centre, 2006)

In Malaysia, there are thirteen states. Sabah is one of these thirteen states. Sabah is situated on the Northern part of the Borneo Island. The state of Sabah is home to various ethnic groups rich in their own culture, language, and religious beliefs (Pugh-Kitingan, 2017; Yew et al., 2018). Sabah itself is also administratively divided into main residencies such as the West Coast Residency, the East Coast Residency,



and the Interior Residency. Sabah Lands and Surveys Department presented Sabah with a total area of 73,620 square km (7.362 mil hectares) and is located between 4–8° North latitude and 115–120° East longitude (JTU, 2018). The West Coast Residency consists of towns and villages which are mainly by the sea coast such as Kudat, Kota Kinabalu, Papar, and Sipitang; whereas the East Coast Residency are towns and villages such as Sandakan, Lahad Datu, Semporna, and Tawau. Towns and villages of the interior are mainly Keningau, Beaufort, Ranau, Tambunan, and Tenom.

The Sabah State Education Department is under the Federal Malaysian Ministry of Education. The Federal Malaysian Ministry of Education which used to be centralized is now moving towards decentralisation. This means more decision rights awarded to states such as Sabah and Sabah's district offices. Sabah could now have more say in identifying areas of improvement for their domestic states, districts, and schools. There would be more possibilities to customize solutions to each school's specific needs (MOE, 2013a).

The Sabah State Education Department have twenty four Local District Education Offices (PPD, Pejabat Pelajaran Daerah). The various schools under the control of these offices are the national government schools, missionary schools, Chinese vernacular schools, and international schools. In 2014, the Malaysian Ministry of Education recorded Sabah with a total of 2,394 secondary schools out of 10,154 secondary schools nationwide (Kementerian Pendidikan Malaysia, 2018). These Sabah schools consist of government Malay or English medium, Chinese medium, and Islamic schools. These Islamic schools are the Religious National Secondary School (SMKA, Sekolah Menengah Kebangsaan Agama) and Religious National Secondary Boarding School (SABK, Sekolah Agama Berasrama Kebangsaan) mentioned earlier. However, other private schools and state schools for example Islamic religious schools are under the Chief Minister's Department.

The Sabah government structure is first the Chief Minister's Department. Under the umbrella of the Chief Minister's Department are other departments, and other government agencies. Since Sabah's independence, the Sabah Islamic Council (MUIS, Majlis Ugama Islam Sabah) under the Sabah Religious Department used to monitor the Muslim communities' educational activities. However, the Sabah Department of Islamic Affairs (JHEAINS, Jabatan Hal Ehwal Agama Islam Negeri Sabah or Sabah Department of Islamic Affairs) took over from MUIS in 1996. It is

