SCIENCE-RELATED ATTITUDES AND SCIENCE ACHIEVEMENT OF FORM THREE STUDENTS IN FULLY RESIDENTIAL SCIENCE'SCHOOLS IN KELANTAN

A thesis submitted to the Graduate School in partial fulfillment of the requirements for the Degree of Master of Science (Management) Universiti Utara Malaysia

by

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(Eyu Foo On)

DEDICATION

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ABSTRAK

Sikap Terhadap Sains Dan Pencapaian Sains Pelajar-Pelajar Tingkatan Tiga Di Sekolah-Sekolah Sains Berasrama Penuh Di Kelantan

Oleh: Eyu Foo On

Kajian ini cuba rnengkaji korelasi di antara pencapaian dalam mata pelajaran sains dengan sikap terhadap sains di kalangan 218 orang pelajar tingkatan tiga di dua buah sekolah berasrama penuh di negeri Kelantan. Di samping itu, ia cuba menentukan (1) sama ada jantina, status sosio-ekonomi (SSE), lokasi rumah dan lokasi sekolah akan memoderasikan hubungan tersebut ; (2) sama ada faktor-faktor sikap terhadap sains akan menjelaskan dengan signifikan varian dalam pencapaian sains dan (3) faktor sikap yang mana satukah akan menjadi peramal terbaik kepada pencapaian sains.

Kajian-kajian yang lampau mengenai korelasi di antara sikap terhadap sains dengan pencapaian sains telah didokumentasikan dengan baik di Malaysia dan tempat-tempat lain. Namun begitu, kajian ini merupakan satu kajian ulung yang cuba menyelidik hubungan tersebut di sekolah-sekolah berasrama penuh di Malaysia. Minat untuk menjalankan kajian ini berasaskan kepada pengumuman-pegumuman nasional masa kini, yang selaras dengan Wawasan 2020, untuk menggalakkan pembangunan sains dan teknologi sebagai satu prasyarat untuk merealisasikan impian Malaysia untuk menjadi sebuah negara maju. Keputusan-keputusan kajian ini adalah berhasrat untuk memberi satu gambaran terhadap posibiliti tersebut.

Kajian ini menyelidik pencapaian sains melalui keputusan-keputusan yang diperolehi daripada Peperiksaan Pertengahan Tahun yang telah dijalankan di

Sekolah Menengah Sains Machang dan Sekolah Tengku Muhd. Far-is Petra. Keputusan-keputusan peperiksaan ini berkemungkinan tidak merangkumi pencapaian sains secara total, namun ianya diiktirafkan sebagai satu peramal yang baik bagi megukur pencapaian pelajar beraraskan Peperiksaan Penilaian Menengah Rendah (PMR). Tiga komponen sikap terhadap sains telah diselidiki: (1) sikap terhadap mata pelajaran sains; (2) sikap terhadap guru-guru sains dan (3) sikap terhadap implikasi sosial dari sains. Instrumen untuk mengukur sikap-sikap tersebut adalah berdasarkan kepada Soalselidik Sikap yang diperkenalkan oleh Skurnik, L.S dan Jeff's, P.M.(1970). Instrumen tersebut telah diprauji untuk kesahan dan reliabiliti; keputusan-keputusan yang diperolehi menghasilkan satu nilai Cronbach Alpha 0.9348. Data telah dianalisis dengan bantuan statistik deskriptif (min dan sisihan piawai), korrelasi Pearson, ujian Chi-kuasadua, ujian-t, analisis regressi linear dan regressi "stepwise". Aras signifikan ditetapkan pada *satu priori 0.05.*

Soalselidik-soalselidik telah dijalankan kepada semua 2 18 pelajar. Populasi digunakan sebagai sampel kerana bilangannya adalah kecil secara relatif dan boleh diuruskan. Kadar respon yang diperolehi ialah 100%. Ini adalah kerana penyelidik sendiri yang menjalankan dan mengumpulkan semua soalselidik dengan sokongan daripada pengetua-pengetua sekolah berkenaan dan pegawai-pegawai daripada Unit Berasrama Penuh, Kementerian Pendidikan.

Seramai 218 responden terdiri daripada 140 pelajar putera dan 78 pelajar puteri; 59 SSE tinggi, 100 SSE sederhana dan 59 SSE rendah; 66 daripada lokasi bandar dan 152 daripada lokasi luar bandar dan; 99 daripada sekolah

berlatarbelakangkan bandar dan 119 daripada sekolah berlatarbelalcangkan luar bandar.

Pemprosesan data menjanakan keputusan-keputusan berikut:

(1) Tidak terdapat korelasi yang signifikan di antara pencapaian sains dengan sikap terhadap sains (berasaskan skor komposit); (2) Pencapaian sains adalah berkorelasi positif dan signiflkan dengan sikap terhadap mata pelajaran sains dan terhadap implikasi sosial dari sains di kalangan pelajar puteri, tetapi tidak untuk pelajar putera. Perbezaan di antara pelajar putera dan puteri adalah tidak signifikan; (3) Pencapaian sains adalah negatif dan tidak berkorelasi secara signifikan dengan sikap terhadap guru sains; (4) Pencapaian sains adalah positif dan berkorelasi secara signifikan dengan sikap terhadap mata pelajaran sains dan implikasi sosial dari sains untuk kumpulan SSE tinggi dan rendah, tetapi negatif dan berkorelasi secara signiflkan untuk kumpulan SSE sederhana. Perbezaan di antara kumpulan SSE tinggi dan rendah adalah signifikan; (5) Pencapaian sains dan sikap terhadap implikasi sosial dari sains adalah positif dan signifikan untuk pelajar-pelajar berlokasi kediaman berasaskan luar bandar, tetapi tidak untuk pelajar-pelajar berlokasi kediaman berasaskan bandar; (6) Sikap terhadap sains menjelaskan secara signifikan varian dalam pencapaian sains. Namun begitu, hanya 6.22% dijelaskan secara signiflkan oleh sikap terhadap sains. Ciri-ciri demografik menjelaskan secara signifikan hanya 1.80% varian tersebut. Ia menggambarkan bahawa 92% varian berkenaan adalah disumbangkan oleh faktor-faktor yang tidak diliputi dalam kajian ini; (7) Peramal terbaik terhadap pencapaian sains ialah sikap terhadap implikasi sosial dari sains; (8) Tidak terdapat perbezaan korelasi yang signifikan diperolehi di antara sikap pelajar putera dan puteri. Sikap positif yang

tinggi diperolehi untuk semua sikap yang dikaji kecuali untuk guru sains; (9) Korelasi yang paling signifikan di antara pencapaian sains dengan sikap terhadap sains adalah sikap terhadap implikasi sosial dari sains.

Korelasi yang lemah, tetapi tidak signifikan di antara pencapaian sains dengan sikap terhadap sains adalah signifikan jika diambil kira penampilan sikap positif yang tinggi di kalangan responden. Pelajar yang berpencapaian tinggi dapat melihat perkaitan sains dengan kursus-kursus sains di universiti. Ini membawa implikasi kepada cabaran keenam Wawasan 2020. Dapatan-dapatan bahawa pencapaian pelajar-pelajar puteri berkorelasi tinggi dengan sikap terhadap sains menunjukkan popularity yang semakin meningkat terhadap sains di kalangan pelajar-pelajar puteri; satu fenomena yang memerlukan kajian lanjutan.

Sikap negatif pelajar terhadap guru sains haruslah diteliti dan ia merupakan satu subjek untuk penyelidikan lanjut. Dapatan bahawa pelajar-pelajar SSE rendah dan pelajar-pelajar dari luar bandar menunjukkan sikap positif terhadap sains yang lebih tinggi membawa implikasi kepada polisi-polisi pendidikan, khususnya dalam memperluaskan peluang-peluang untuk kemasukan ke sekolah berasrama penuh dan pembukaan peluang-peluang untuk bantuan kewangan kepada ahli-ahli masyarakat yang kurang bernasib baik.

Oleh kerana kajian in adalah terhad kepada dua buah sekolah berasrama penuh dan prestasi pencapaian pelajar dalam Peperiksaan Pertengahan Tahun, keputusan-keputusan dalam kajian ini tidak dapat digeneralisasikan untuk pelajar-pelajar dari semua sekolah berasrama penuh.. Jadi, dengan ini, diperakukan bahawa satu kajian menyeluruh di peringkat nasional perlu dijalankan untuk

kesemua 33 buah sekolah berasrama penuh dengan memasukkan faktor-faktor pencapaian sains yang lebih lengkap.

ABSTRACT

Science-Related Attitudes And Science Achievement Of Form Three Students In Fully Residential Science Schools In Kelantan

by: Eyu Foo On

This study attempted to investigate the correlation between science achievement and science attitudes among 218 form three students of two fully residential science schools in Kelantan. Corollary, it attempted to determine (1) whether gender, SES, school and home settings will moderate the relationship; (2) whether science attitude factors will significantly explain the variance in science achievement; and (3) which science attitude factor will best predict science achievement.

Previous studies on the correlation between science attitudes and science achievement are well documented in Malaysia and elsewhere, However, this study is the first attempt to investigate the relationship in fully residential schools in Malaysia. The interest to conduct the study was based on the present national pronouncements, in line with the sixth challenge of Vision 2020, to promote science and technology development as a precondition for the realisation of Malaysia's dream to become a fully industrialised nation. The results of this study were intended to provide insights for that possibility.

This study investigated science achievement from the results obtained from the mid-term examinations conducted in Sekolah Menengah Sains Machang and Sekolah Tengku Muhammad Faris Petra. While this examination result may not

capture the totality of science achievement, it is recognised as a good predictor for the performance of the students for the Lower Secondary Assessment (PMR) Examination. Three science attitude components were examined: (1) attitudes towards science subjects; (2) attitude towards science teachers and (3) attitudes towards the social implications of science. The instrument was based on the Attitude Questionnaire developed by Skurnik, L.S and Jeffs, P.M. (1970). The instrument was pretested for validity and reliability, the results of which yielded a reliability Cronbach Alpha of 0.9348. The data were analysed with the aid of descriptive statistics (mean and standard deviations); Pearson Correlation, Chi-square, T-test, Linear Regression Analysis and Stepwise Regression. The level of significance was set *a priori* at 0.05.

The questionnaires were administered to all the 218 students. The population was used as sample since the number was relatively small and manageable. A response rate of 100 % was obtained since the researcher personally administered and collected the questionnaires with the support of the school principals and officials of the Boarding School Unit, School Division of Ministry of Education.

The 218 respondents consisted of 140 males and 78 females; 59 high SES, 100 average SES and 59 low SES; 66 from urban and 152 from rural home settings and 99 from urban and 119 from rural school settings.

The investigation of the data generated the following results: (1) There is no significant correlation between science achievement and science attitudes (composite scores); (2) Science achievement is positively and significantly

correlated with attitudes towards science subjects and attitudes towards the social implications of science among female students, but not among their male counterparts; the difference between the males and females is not significant; (3) Science achievement is negatively and not significantly correlated with attitudes towards science teachers; (4) Science achievement is positively and significantly correlated with science attitudes towards science subjects and the social implications of science for the high and low SES groups but negatively and significantly correlated for the average SES group. The differences between the high and low SES groups were significant; (5) Correlation between science achievement and attitudes towards the social implications of science is positive and significant for rural-home based students, but not for urban-home based students; (6) Science attitudes significantly explained the variance in science achievement. However only 6.22 % was explained significantly by science attitudes. Demographic characteristics significantly explained only 1.80 % of the variance. It appears that 92 % of the variance are attributable to factors not explored in this study; (7) The best predictor for science achievement is attitude towards the social implications of science; (8) There is no significant difference in the correlation for attitudes between male and female students. High positive attitudes were registered except towards science teachers; (9) The most significant correlation between science achievement and science attitude was noted for attitudes towards the social implications of science.

The weak, but not significant correlation between science achievement and science attitudes is significant considering the registration of high positive attitudes among the respondents. The high achievers foresee the pursuit of science-related

courses in the university. This bears implications to the sixth challenge of Vision 2020. The findings that achievement of female students correlated highly with science attitudes tend to indicate the growing popularity of science among female students - a phenomenon that needs further study.

The negative attitude of students towards science teachers must be examined and be made a subject for further research. The finding that low SES rural-home based students registered more positive attitudes towards science bears implication to education policies specifically in the widening of opportunities for access to science residential schools and the opening of opportunities for financial support for the less privileged members of society.

The study was limited to two residential science schools and the mid-term performance of the students and, therefore, the results could not be generalised for all fully residential science school students. It is, therefore, recommended that a nation-wide study of all the 33 fully residential science schools be conducted with the inclusion of all science achievement factors.

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GLOSSARY OF TERMS

Bumiputera	Malay and other indigeneous people in Malaysia.
SES	Socio-Ecocnomic Status. (Status Socio-Ekonomi)
SBP	Fully Residential School (Sekolah Berasrama Penuh)
KBSM	Integrated Curriculum for Secondary School (Kurrikulum Bersepadu Sekolah Menengah)
PMR	Lower Secondary Assessment Examination (Peperiksaan Penilaian Menengah Rendah)
SRP	Lower Certificate of Education (Sijil Rendah Pelajaran)
MARA	Council of Trust for the Indigeneous People (Majlis Amanah Rakyat)
NAEP	National Assessment of Education Performance
SISS	Second International Science Study
AAUM	American Association of University Women.
IEA	International Association for Evaluation of Education Achievement

CHAPTER 1

INTRODUCTION

1.1 Context of the Problem

The Sixth Challenge of Vision 2020 provides the establishment of

> **" a scientific and progressive society, a society that is innovative and forward looking, one that is not only a consumer of technology, but also a contributor to the scientific and technological civilisation of the future " (Mahathir Mohamad, 1991)**

This challenge bears implications to the educational system at all levels. Specifically, it is addressed to institutions charged with the responsibility of training students in science and mathematics. This is anchored on the philosophy that the growth, development and progress of a nation depends, to a large extent, on the level and quality of national education.

As early as 1973, the Ministry of Education addressed the need for encouraging Bumiputera students to participate in science education through the establishment of fully residential science secondary schools with the hope of inculcating positive attitudes towards science as a precondition for recruiting more students in higher education in the field of science and technology.

In 1995, the Ministry of Education explicitly expressed the objective of increasing the number of science students with the corresponding provision

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