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Teaching science and mathematics in english steering mastery in english language amongst sciences students in UKM

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Abstract

This study was conducted to ascertain teaching Science and Mathematics in English will enhance English proficiency amongst the science stream students in UKM. The study found that the students agreed that the teaching of Science and Mathematics in English can improve their English proficiency. The results showed that teaching Science and Mathematics in English is capable of being a driven force in mastering basic English language and communication, and also in improving the explanation of the concept of Science and Mathematics in English.

Keywords: Driven force; english proficiency; language; mathematics and science

1. Introduction

In 2003, Malaysian Ministry of Education implemented a policy in teaching and learning English in Science and Mathematics (PPSMI) to the education system. The preference to use English was based on the rationale that mastery of English is regarded as an important mechanism for students to acquire proficiency in Englishin the field of science and technology. Nevertheless, there were lots of feedbacks and criticisms against supporting this policy from various issues. Studies on the effectiveness of this policy in educations have been conducted, such as by Yahaya et al., (2009), Ong and Tan (2008), Aziz (2005), Neville-Barton and Barton (2005) and Foong (2003). Therefore, the government has come to a decision to terminate and abolish the policy and introduce a new policy;

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Improving the quality of Malay Language, Strengthening English language (MBMMBI) in year 2012 (Malaysia kini, 2009; Bernama, 2009). However, now this new policy has slowly been introduced to the education system. Although the PPSMI policy is going to be abolished, we have to review the effect of the PPSMI implementation on the students' English language proficiency. Various studies has been done to review this issue by academicians such as Zaidi *et al*. (2011), Noriza et al. (2011), Wan Rosmanira et al., (2011), Berita Harian (2010, 2011) and mStar (2009) and Tuah and Mohini (2008).

Therefore, this study aims to investigate the outcome of the PPSMI implementation among the students of higher institution in steering mastery English language, mainly amongst the sciences students in UniversitiKebangsaan Malaysia (UKM).

2. Methodology

The data for this study was obtained through questionnaires distributed to the sciences students in UKM from the Faculty of Science and Technology (FST), Faculty of Education (FPEND), Faculty of Engineering and Built Environment (FKAB) and Faculty of Information Science and Technology (FTSM). The faculties were chosen to fulfill the objectives of the study due to the students' background where they had undergone the learning of science in English since their secondary school level until they further higher studies in UKM.

The number of respondents involved was 435 students, in which 187 from FST, 103 students from FPEND, 54 students from FKAB and 91 students from FTSM. A Likert scale ranging from 1 to 10 was used to measure the capability ofteaching and learningof Science and Mathematics (S&M) in English, being a driven force in mastering basic English language and communication, and also in improving the explanation of the concept ofS&M in English. The scale ranges from 1 that represents strongly disagree while 10 represents strongly agree to 3 questions about students' mastery in English language. The scale range was then divided into two categories; agree and disagree. An average score of 1 to 7 showed that the students disagree that teaching English in S&M would enhance their English proficiency, while an average score of 8 to 10 showed otherwise.

A descriptive analysis was done to look at respondents' profiles based on demographic factors. In order to measure either the students agree or disagree with teaching English in S&M would enhance the students' mastery level in English language, the odds ratio method is used.

The odds ratio measures the strength between two binary data (agree and disagree) explaining how much more likely it is that students disagree with teaching English in S&M would not enhance their competency level in English language (first group) as compared to the students that agree (second group).An odds ratio of 1 implies that the event is equally likely in both groups. An odds ratio greater than one implies that the event is more likely in the first group. An odds ratio less than one implies that the event is less likely in the first group. Besides that, the study also investigated either the demographic factors associate with the odds ratio outcome or not.

3. Study Results

3.1 Profile of Respondents

The number of respondents involved was 441 students, in which 188 from FST, 103 students from FPEND, 57 students from FKAB and 93 students from FTSM. The background information of the respondents is displayed in Table 1. Majority of the respondents are female FST students followed by FTSM and FPEND. There are more male students at FKAB than female students. Majority of the respondents are Malays, followed by Chinese, Indians and others, except for FTSM respondents where Chinese are slightly more than the Malays. According to the year of studies, for third year students, the majority arefrom FPEND, while for second year students are from FST and FTSM and for first year students are from FKAB. Most respondents obtained a Malaysian University English Test (MUET) grade of at least Band 3 out of maximum band of 6. The result shows that majority of the respondents are those from FST, FPEND and FKAB withMatriculation certificate while FTSM students are those who obtained STPM(Malaysian Higher School Certificate) certificate. Matriculation Program is a preparatory program for Malaysian students to qualify them to Degree Programs in the fields of Science and Technology in both local and overseas universities.

In terms of verbalcommand at home, majority of the respondents use Malay language, followed by Mandarin, English and others. This is consistent with the races of the students. This shows that most FST, FPEND and FKAB students communicatein Malay language as a medium of command in primary and secondary school levels, while in Mandarin for FTSM students. However, English is the medium of command at pre-university level for most students from FST, FKAB and FTSM.Meanwhile, FPEND students are classified into two groups; one group learned in Malay language while the other in English.

Table 1.Respondents' background

n = 441	FST Frequency (%)	FPEND Frequency (%)	FKAB Frequency (%)	FTSM Frequency (%)
Gender				
Male	73 (16.6)	40 (9.1)	33 (7.5)	23 (5.2)
Female	115 (26.1)	63 (14.3)	24 (5.4)	70 (15.9)
Race				
Chinese	67 (15.2)	46 (10.5)	17 (3.9)	48 (10.9)
Indian	13 (3.0)	1 (0.2)	7 (1.6)	1 (0.2)
Malay	106 (24.1)	54 (12.3)	30 (6.8)	38 (8.6)
Others	2 (0.5)	2 (0.5)	3 (0.7)	5 (1.1)
Year of Study				
Year 1	34 (7.8)	0 (0.0)	29 (6.6)	1 (0.2)
Year 2	107 (24.5)	5 (1.1)	25 (5.7)	87 (19.9)
Year>=3	46 (10.5)	98 (22.4)	1 (0.,2)	4 (0.9)
MUET Grade				
Band 1	2 (0.5)	6 (1.4)	0 (0.0)	1 (0.2)
Band 2	28 (6.4)	18 (4.1)	5 (1.1)	14 (3.2)
Band 3	103 (23.5)	40 (9.1)	28 (6.4)	48 (11.0)
Band 4	47 (10.7)	32 (7.3)	22 (5.0)	25 (5.7)
Band 5	5 (1.1)	7 (1.6)	2 (0.5)	3 (0.7)
Band 6	2 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)
UKM Entry Qualification				
Diploma	4 (0.9)	13 (3.0)	0 (0.0)	12 (2.7)
Matriculation	152 (34.5)	44 (10.0)	43 (9.8)	32 (7.3)
STPM	27 (6.1)	42 (9.5)	14 (3.2)	45 (10.2)
Senior High School	5 (1.1)	4 0.9)	0 (0.0)	3 (0.7)
Language at Home				
Mandarin	26 (5.9)	42 (9.5)	16 (3.6)	48 (10.9)
English	47 (10.7)	4 (0.9)	3 (0.7)	3 (0.7)
Malay Language	107 (24.3)	55 (12.5)	30 (6.8)	39 (8.8)
Tamil	8 (1.8)	0 (0.0)	5 (1.1)	2 (0.5)
Others	0 (0.0)	2 (0.5)	3 (0.7)	1 (0.2)
Learning Language at Primary School Level				
Mandarin	14 (3.2)	3 (0.7)	15 (3.4)	45 (10.2)
English	10 (2.3)	0 (0.0)	5 (1.1)	1 (0.2)
Malay Language	159 (36.1)	100 (22.7)	35 (7.9)	46 (10.4)
Tamil	5 (1.1)	0 (0.0)	2 (0.5)	1 (0.2)
Learning Language at Secondary School Level				
Mandarin	4 (0.9)	0 (0.0)	0 (0.0)	9 (2.0)
English	36 (8.2)	1 (0.2)	24 (5.4)	7 (1.6)
Malay Language	144 (32.7)	102 (23.1)	33 (7.5)	76 (17.2)
Tamil	4 (0.9)	0 (0.0)	0 (0.0)	1 (0.2)

Table 1.Respondent's background (cont'd)

Learning Language at Pre-University Level				
Mandarin	4 (0.9)	0 (0.0)	0 (0.0)	6 (1.4)
English	162 (36.8)	48 (10.9)	51 (11.6)	77 (17.5)
Malay Language	18 (4.1)	55 (12.5)	6 (1.4)	9 (2.0)

Tamil	4 (0.9)	0 (0.0)	0 (0.0)	0 (0.0)
Level of Reading in English				
Weak	1 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)
Unsatisfactory	3 (0.7)	2 (0.5)	2 (0.5)	0 (0.0)
Average	55 (12.6)	33 (7.6)	11 (2.5)	23 (5.3)
Satisfactory	105 (24.0)	53 (12.1)	33 (7.6)	60 (13.7)
Excellent	24 (5.5)	15 (3.4)	8 (1.8)	9 (2.1)
Level of Listening in English				
Weak	0 (0.0)	0 (0.0)	1 (0.2)	0 (0.0)
Unsatisfactory	4 (0.9)	4 (0.9)	1 (0.2)	2 (0.5)
Average	76 (17.4)	47 (10.8)	16 (3.7)	33 (7.6)
Satisfactory	100 (22.9)	40 (9.2)	32 (7.3)	52 (11.9)
Excellent	8 (1.8)	12 (2.8)	4 (0.9)	4 (0.9)
Level of Writing in English				
Weak	0 (0.0)	2 (0.5)	1 (0.2)	0 (0.0)
Unsatisfactory	7 (1.6)	7 (1.6)	4 (0.9)	3 (0.7)
Average	91 (20.9)	46 (10.6)	21 (4.8)	49 (11.2)
Satisfactory	82 (18.8)	44 (10.1)	25 (5.7)	37 (8.5)
Excellent	8 (1.8)	4 (0.9)	3 (0.7)	2 (0.5)
Level of Speaking in English				
Weak	0 (0.0)	2 (0.5)	0 (0.0)	0 (0.0)
Unsatisfactory	12 (2.8)	16 (3.7)	7 (1.6)	11 (2.5)
Average	112 (25.7)	48 (11.0)	19 (4.4)	50 (11.5)
Satisfactory	60 (13.8)	33 (7.6)	26 (6.0)	29 (6.7)
Excellent	4 (0.9)	4 (0.9)	2 (0.5)	1 (0.2)

Students were asked to rate themselves for their command of English in reading, listening, writing and speaking. A Likert scale ranging from 1 to 5 was used to rate the students' competency in English. The scale of 1 represents weak command while 5 represents excellent command. Table 1shows that most of the students from each faculty felt that their reading and listening skills in English are satisfactory while the writingand speaking skills in English are average. Very few of them felt that they were weak or excellent in reading, listening, writing and speaking skills in English.

3.2 Analysis of Odds Ratio

The results in Table 2 shows that students with unsatisfactory English competency, are most likely to disagree to the teaching of S&M in English with the odds of 109/90=1.211. However, those who also have unsatisfactory English level but agree to the teaching of S&M in English have the odds of 78/158=0.4937.The odds ratio is then calculated by OR= (109.158)/(90.78)=2.453, with 95% C.I (1.662, 3.621), showing that students who disagree with the teaching of S&M in English are more likely to be less competent in English compared to those who agree. In this case there is an association between teachings of S&M in English with English competency level.

Table 2.Classification of English Competency and Teaching of S&M in English

		English competency		Total	Odds ratio
		Unsatisfactory	Satisfactory		
Teaching S&M in English would improve English language competency	Disagree	109	90	199	2.453
	Agree	78	158	236	
	Total	187	248	435	

Further analysis is carried out to ascertain whether this association is confounded by certain confounding factors such as ethnic, academic qualification, faculties, academic year and MUET grades. For example, the ethnic might confound the association between English competency and the teaching of S&M in English. One way to address

confounding is to stratify the data into relatively homogenous subgroups ("strata") according to the confounding factors.

3.2.1 Stratification by Ethnic

For this analysis, we compare theagreementlevel of teaching S&M in English byethnic groups and investigated whether the odds ratio vary among Chinese and non-Chinese students as shown in Table 3. Non-Chinese students consist of the Malays and Indian students. The Indians is grouped together with the Malays due to small number of Indian students.

Table 3.Odds ratio after stratification by Ethnic

Ethnic			English competency		Odds Ratio
			Unsatisfactory	Satisfactory	
Chinese	Teaching of S&M in English	Disagree	36	36	1.69
		Agree	39	66	
non-Chinese	Teaching of S&M in English	Disagree	70	54	2.73
		Agree	39	82	

The odds ratio for Chinese and non-Chinese (Malays and Indians)are 1.69 and 2.73 respectively. The odds ratio differs when stratified by ethnic. Test of homogeneity, gives $\chi^2 = 2.353,\ p\text{-}value = 0.125$ which signifies no significant difference between the strata odds ratios and shows that there is nointeractionbetween the agreement level towards teaching S&M in English and ethnicity. Ethnic is a confounding factor for the relationship between teaching S&M in English and the competency of English language. Since, the odds ratio across ethnic are considered homogenous we used the common odds ratio adjusted for ethnic, OR=2.435 as estimate. The students who disagree to the teaching of S&M in English are more likely to have lower English competency than those who agree.

3.2.2 Stratification by Academic qualification

An odds ratio for each category for academic qualification is calculated as in Table4. Even though there seem to be differences in odds ratio but the differences are not large enough. The homogeneity test of odds ratio shows that $\chi^2 = 6.188,\ \text{p-value} = 0.103\ (\text{two sided})$, which concludes that there areno significant differences in odds ratio across academic qualification.In this case, there is no interaction between the agreement level and academic qualification and concludes that academic qualification is a confounder. An estimate of common odds ratio after adjustment for academic qualification is 2.629. The students who disagree with the teaching of S&M in English are more likely to be from the lower English competency group.

Table 4.Odds ratio after stratification by Academic qualification

Academic Qualification			English competency			Odds Ratio
			Unsatisfactory	Satisfactory	Total	
Diploma	Teaching of S&M in English	Disagree	6	11	17	
		Agree	6	6	12	0.545
	Total		12	17	29	
Matriculation	Teaching of S&M in English	Disagree	66	61	127	
		Agree	39	101	140	2.802
	Total		105	162	267	
STPM	Teaching of S&M in English	Disagree	35	14	49	
		Agree	30	47	77	3.96
	Total		65	61	126	
Senior high school	Teaching of S&M in English	Disagree	2	4	6	
		Agree	2	4	6	1.00
	Total		4	8	12	

3.2.3 Stratification by Faculty

Stratification by faculty as in Table 5 shows that the odds ratio varies across strata, with FKAB having the highest odds ratio.The homogeneity test, $\chi^2 = 5.084$, p-value=0.17 (two sided) , shows that there is no significant different in the odds ratio and interaction does not exist between Faculty and agreement level towards teaching S&M in English. Faculty is another confounding factor. The estimate for common odds ratio after adjusted for Faculty is 2.412, which concludes that the students who disagree with the teaching of S&M are more likely to unsatisfactory English competency.

Table 5. Odds ratio after stratification by faculty

Faculty			English competency			Odds Ratio
			Unsatisfactory	Satisfactory	Total	
FKAB	Teaching of S&M	Disagree	12	4	16	
	in English	Agree	9	29	38	9.667
	Total		21	33	54	
FPEND	Teaching of S&M	Disagree	37	29	66	
	in English	Agree	13	24	37	2.355
	Total		50	53	103	
FST	Teaching of S&M	Disagree	45	42	87	
	in English	Agree	33	67	100	2.175
	Total		78	109	187	
FTSM	Teaching of S&M	Disagree	15	15	30	
	in English	Agree	23	38	61	1.652
	Total		38	53	91	

3.2.4. Stratification by academic year

Stratification by academic year investigates whether students from different academic year have different opinion regarding the teaching of S&M in English. From Table 6, the odds ratios by academic year shows variation in the odds ratios, however, the homogeneity test with $\chi^2 = 3.038$, p-value = 0.219 (two sided), shows there is no significant difference among the odds ratio between the academic years. No interaction exist between the agreement level towards teaching S&M in English and academic year and conclude that academic year is a confounder. The estimate of common odds ratios is 2.317 after adjusted for academic year.

Table 6. Odds ratio after stratification by Academic year

Academic year			English competency			Odds ratio
			Unsatisfactory	Satisfactory	Total	
First year	Teaching of S&M	Disagree	16	7	23	
	in English	Agree	12	27	39	5.143
	Total		28	34	62	
Second year	Teaching of S&M	Disagree	42	38	80	
	in English	Agree	44	96	140	2.411
	Total		86	134	220	
Third year and above	Teaching of S&M	Disagree	49	45	94	
	in English	Agree	22	33	55	1.633
	Total		71	78	149	

3.2.5. Stratification by MUET grades

For stratification by MUET grades, we have to regroup the data for the lowest and highest bands due to small number of students in those groups. We grouped Band 1 withBand 2 and Band 5 with Band 6. The resulting odds ratios are as shown in Table 7. Even though there are variations in the odds ratios between bands but these differences are not significantas shown from the homogeneity test with $\chi^2 = 3.195$, p-value = 0.363 (two sided). The estimate of common odds after adjusted for MUET grades is 1.877.

Table 7.Odds ratio after stratification by MUET grades

MUET Grades			English competency			Odds Ratio
			Unsatisfactory	Satisfactory		
Band 1&2	Teaching of S&M in English	Disagree	31	11	42	0.841
		Agree	20	5	22	
	Total		48	16	64	
Band 3	Teaching of S&M in English	Disagree	58	56	114	2.233
		Agree	32	69	101	
	Total		90	125	215	
Band 4	Teaching of S&M in English	Disagree	12	17	29	2.271
		Agree	23	74	97	
	Total		35	91	126	
Band 5&6	Teaching of S&M in English	Disagree	1	5	4	0.60
		Agree	3	9	12	
	Total		4	12	16	

4. Conclusion

The study on whether teaching Science and Mathematics in English will enhance English proficiency amongst the science stream students in UKM showed that there is an association between students who disagree with the teaching of S&M in English and their English competency. The students who disagree with the teaching of S&M in English are more likely to be less competent in English compared to those who agree. The relationship between the agreement level of teaching S&M and English competency is found to be confounded by ethnic, academic qualification, faculties, academic year and MUET grades. No interaction was observed between the agreement level of teaching S&M and confounding factors.

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References

Yahaya, M.F., Mohd Noor, M.A., Moktar, A.A., Mohd Rawian, R., Othman, M. & Jusoff, K. (2009). Teaching of Mathematics and Science in English: The teachers' voices. *English Language Teaching*, 2(2): 141-147.

Ong, S.L. & Tan, M. (2008). Mathematics and Science in English: Teachers experience inside the classroom. *Jurnal Pendidik dan Pendidikan*, 23:141-150.

Aziz, N. (2005). Students Perception On Teaching And Learning Mathematics In English.*Buletin Pendidikan Sains dan Matematik Johor*, 14 (1).ISSN 0128-4290.

Neville-Barton, P. & Barton, B. (2005).The Relationships Between English Language and Mathematics Learning for Non-native Speakers. *Teaching & Learning Research Initiative*. http://www.tlri.org.nz/pdfs/9211_summaryreport.pdf[20 Oktober 2010].

Foong, C.K. (2004). English for the teaching of Mathematics and Science (ETeMS): From concept to implementation. http://www.eltcm.org/eltc/download/paperbank PDFs/English for the Teaching of Mathematics and Science paper.pdf [20 November 2010].

Malaysiakini, 8 Julai 2009. "PPSMI dimansuhkan mulai 2012".

Bernama, 20 Oktober 2009. "Kerajaan Tidak Akan Kembali Kepada PPSMI, Kata Muhyiddin".

Zaidi Isa, Abdul Malek Zakaria, Mohd Ikhwan Azlan, Mohd Salmi Md. Noorani, Noriza Majid, Hamizun Ismail*, Saiful Hafizah Jaaman, Azmin Sham Rambely, Rokiah@Rozita Ahmad, Maslina Darus, Roslinda Mohd Nazar, Zalina Mohd Ali, Najib Mahmood Rafee, Nur Riza Mohd Suradi, Siti Norafidah Mohd Ramli, Ummul Khair Salma Din, Faridatulazna Ahmad Shahabuddin, Wan Rosmanira Ismail, Nur Jumaadzan Zaleha Mamat, Nora Muda, Norkisme Zainal Abidin, Zainol Mustafa, Abdul Ghafur Ahmad & Ishak Hashim. (2011). Students' Perception of The Implementation of Teaching and Learning of Mathematics and Science in English in Universiti Kebangsaan Malaysia. *Procedia Social and Behavioral Science,* 18(2011): 361-366.

Noriza Majid, Saiful Hafizah Jaaman, Maslina Darus, Roslinda Mohd Nazar, Siti Norafidah Mohd Ramli, Nur Riza Mohd Suradi, Azmin ShamRambely, Rokiah@Rozita Ahmad, Ummul Khair Salma Din, Faridatulazna Ahmad Shahabuddin, Zalina Mohd Ali, Najib Mahmood Rafee,Wan Rosmanira Ismail, Nur Jumaadzan Zaleha Mamat, Nora Muda, Norkisme Zainal Abidin, Mohd Salmi Md. Noorani, Abdul MalekZakaria, Zaidi Isa, Hamizun Ismail, Zainol Mustafa, Abdul Ghafur Ahmad, Muhammad Ikhwan Azlan, Ishak Hashim. (2011). The Readinessof Mathematics and Science Lecturers to Teach in English from Students' Perspective.*Procedia Social and Behavioural Sciences*, 18(2011): 342-347.

Wan Rosmanira Ismail, Zainol Mustafa, Nora Muda, Norkisme Zainal Abidin, Zaidi Isa, Abdul Malek Zakaria, Nur Riza Mohd Suradi, NurJumaadzan Zaleha Mamat, Roslinda Mohd Nazar, Zalina Mohd Ali, Najib Mahmood Rafee, Noriza Majid, Saiful Hafizah Jaaman, MaslinaDarus, Rokiah @ Rozita Ahmad, Faridatulazna Ahmad Shahabuddin, Azmin Sham Rambely, Ummul Khair Salma Din, Ishak Hashim,Hamizun Ismail, Abdul Ghafur Ahmad, Mohd Salmi Md. Noorani, Siti Norafidah Mohd Ramli, Mohd Ikhwan Azlan. (2011). Students'Inclination towards English Language as a Medium of Instruction in the Teaching of Science and Mathematics in UKM: A Case Study at theFaculty of Science and Technology and Faculty of Education. *Procedia Social and Behavioural Sciences*, 18(2011): 353-360.

Berita Harian. (2010). *http://saharuddin-abdullah.blogspot.com/2010/12/bahasa-melayu-sebagai-saluran.html*

Berita Harian. (2011).MBMMBI mampu melahirkan generasi fasih Melayu, Inggeris. http://www.moe.gov.my/?id=169&lang=my

mStar. (2009). "Saya masih belum puas hati hasil kajian PPSMI - Muhyiddin". 2009-05-05.

Tuah Ishak & Mohini Mohamed. (2008). Effects of Teaching and Learning Science and Mathematics in English on students of Universiti Teknologi Malaysia.*Seminar Kebangsaan Pendidikan Sains dan Matematik.*1-8.