

# **Students' Perception On Teaching And Learning Mathematics In English**

By

Aziz bin Nordin  
p-aziz@utm.my  
Faculty of Education  
Universiti Teknologi Malaysia

## **Abstract**

Students use language to communicate and to understand mathematics concepts. Language influences students' thought by molding perception and structuring ideas. However, in recent years, science and mathematics in lower secondary subjects have been taught in English. This may create problems in learning these subjects. Therefore, this research was carried out to gather information and to get the clearer picture on what have happened regarding the teaching and learning science and mathematics in schools. The research instrument was a set of 16-item questionnaire that was designed to identify students' perception on teaching and learning mathematics. The respondents consist of 279 lower secondary school students from three schools in rural area of Johor, Malaysia. The research found out that the respondents agreed to the importance of English Language in everyday life as well as career opportunity however they felt that learning science and mathematics was very difficult and demanding. This is due to the lack of ability in understanding of the subject matters and the instruction language. The result also showed that learning science is more difficult than learning mathematics. Finally, the findings revealed that there are challenges for the science and mathematics teachers to work wisely in order to overcome students' learning difficulties and to promote effective learning among students.

## **INTRODUCTION**

In learning mathematics, students frequently encounter mathematics problems involving calculations, understanding of concepts, principles and mathematical relationship with others subjects. Study on engineering students' perceptions in learning mathematics at Universiti Teknologi Malaysia and some schools in Johor has been carried out and the results showed that mathematics subject was one of the interesting and important subject to learn but it was difficult one to learn (Aziz, 1992). The reasons why mathematics subject are difficult to learn is that the concepts in mathematics are abstract and difficult to understand, and also the students have alternative meaning of certain mathematical words before any mathematics teaching takes place. According to Ihejiro (1995), there are factors other than academic standing on the students' side which could explain the performance trend. These factors are;

- i. Students' dislike for mathematics that may stem from psychological incidences such as fear, endurance, perseverance and associated factors.
- ii. The mathematics curriculum may have not much relevance to real life situation.
- iii. Mathematics teachers were not interested in the subject and did not help their students by way of catering for individual differences.
- iv. Other resources material such as text books seemed lacking in both in school and at home.

Since the mathematical knowledge and skills can only be delivered through language therefore this study will only focus on students' understanding in mathematics that experience English medium of instruction. This is necessary because language plays an important role in communication, thinking and is a tool for exchanging ideas and concepts between individuals (Aziz, 2003). However, recently science and mathematics have been taught in English. This may create unfamiliarity to those concepts taught to them and may slow down or retard their science and mathematics learning. Sudden change to the current science and mathematic medium of instruction may also cause cultural shock to the students. Normally, students' conceptions of prior experience and knowledge influence students' learning in science and mathematics. Students prior knowledge and experience can be amazingly tenacious and resistance to change (Gilbert, 1982). It is therefore essential for this research to explore student's viewpoints and perceptions on teaching and learning mathematics in English in order to gather information and to get the clearer picture on what have happening in schools.

## **RESEARCH PROBLEMS**

Language influences students' thought by molding perception and structuring ideas. In learning mathematics students use language to communicate and to understand mathematical facts, concepts, principles and problem solving. However these knowledge and skills are new, unfamiliar and different from the language used in everyday life (Osborne, et al., 1983). This may cause a problem in the understanding of the mathematics concepts. To investigate this problem, the following questions are raised:

1. Do the students have problems in learning mathematics in English?
2. What are the factors that contribute to the learning problems?
3. Is that any relationship between the factors that contribute to the learning problems?

## **RESEARCH METHODOLOGY**

A survey was conducted in several secondary schools in rural area of one district in Johor to gather information regarding students' perception on teaching and learning mathematics in English. The instrument used for this study was a set of questionnaire that comprised of two parts. Part one elicited information on the students' background. Part two of the questionnaire comprised sixteen items regarding students perception on teaching and learning science and mathematic in English. The questionnaire was administered to 279 form one and two students of several secondary schools. The respondents were given 40 minutes to complete the questionnaire. The data were analyzed statistically by using SPSSPC software program. The statistical analyses used are frequency, percentage, reliability index and correlation coefficient. The reliability index (Cronbach  $\alpha$ ) of the study for all the 279 respondents was 0.70. For the qualitative analysis, written responses of the students were analysed by listing the problems encountered by each students in his explanation.

## **RESULTS OF THE STUDY**

Malay language previously has been used as a medium of instruction for learning science and mathematics in schools. However with the changes of a medium of instruction to English, the study revealed that some students do have problems in learning mathematics. For the purpose of this paper the findings on students' performance and background that may contribute to the problems in learning mathematics, students' understanding of English language used in teaching mathematics and the correlations among factors that related to the learning problems will be discussed. The general picture will be presented first, and this will be followed by more detailed discussion of data.

### *i. Students background and problem in learning mathematics in English.*

The findings of this study indicated that students have encountered problems in understanding of the teachers' teaching in English language. Table 1 showed that students performance in English language can be categorized as satisfactory because only 9.4% of the respondents have an A grade in UPSR examination while most of them (40%) are in a C grade group. It is also very clear that the distribution patterns of the science, mathematics and English results in Primary School Assessment Test (UPSR) are differently distributed.

However, the most interesting part in this finding is the drastic drop of science monthly test results when compared to UPSR science result, where 19.9 respondents obtained an A grade in UPSR but only 4.6% of the respondents obtained an A grade in their monthly test. This is probably due to the science contents which are more advanced than before or the respondents do not understand the lesson which is conducted in English.

**Table 1: Students' result of UPSR and Monthly Test in English, Mathematics and Science subjects in percentage.**

Subject	English		Mathematics		Science	
	UPSR	Monthly test	UPSR	Monthly test	UPSR	Monthly test
<b>A</b>	9.4	7.8	31.8	27.8	19.9	4.6
<b>B</b>	28.3	20.2	30.7	26.6	37.9	14.4
<b>C</b>	40.2	25.7	30.7	19.8	31.8	28.1
<b>D</b>	14.9	19.5	3.6	16.3	4.3	27.4
<b>E</b>	7.2	26.8	3.2	3.2	9.5	6.1

ii. *Students interest in Science, Mathematics and English subjects.*

**Table 2: The distribution of students' interest in English, Mathematics and Science.**

Subject Rank order	English	Mathematics	Science
High	21.6	55.2	25.9
Medium	34.4	26.0	47.1
Low	44.0	18.8	27.0

Interest closely related to motivation, and motivation is one the learning factors that influences and stimulates students to learn (Bloom, 1976). As a result motivation leads someone to learn effectively and successfully. Table 2 shows that mathematics is one of the most interesting subjects to learn compared to science and English subjects, where 55.2% of the respondents rated mathematics as high interesting subject to learn. This finding seems to be consistent with the mathematics' monthly test result as illustrated in Table 1 where high percentage of respondent scores grade A in monthly mathematics test. Table 1 and 2 are also indicated that mathematics is less influenced by the used of English language as a medium of instruction compared to science subject.

iii. *Understanding of science and mathematics in English language.*

According to the Psychology Dictionary, *understand* is defined as the process of becoming aware of the relationship between thing or their meaning (Evans, 1978). To learn effectively, someone has to understand what he/she had learned. Nevertheless, the study has found that the respondents were really having problems in learning science and mathematics but the problems were more obvious in learning science. This was possibly due to the nature of science that comprises a lot of factors, concepts and principles as well as problem solving processes in its content.

When English language has been used as a medium of instruction in schools, the proficiency of English language is a must for respondents to understand what their teacher's teach. Unfortunately, the findings showed that students' competency in English are at low level as only 6.5% agreed that they could speak English very well and fluently (Item S1), majority of them could not speak very well.

The findings also revealed that majority of the respondents have not taken part in many learning activities, such as questions and answers activities with their teachers and fellow friends (Item S2 and S8), teacher teaching activities (Item S5), and to speak English with teacher and friend in classroom (Item S4 and S6), and these are among several reasons why they could not improve their English language and so forth related to their problems in understanding science and mathematics in English.

**Table 3: Students' opinion of understanding science and mathematics in English language.**

Items	Statements	Disagree(1)	Not Sure(2)	Agree(3)
S1	I could speak English very well and fluently	19.9	73.6	6.5
S2	I could answer questions asked by my teacher very well	21.9	71.7	6.5
S4	I speak English with my friends in science and mathematics classes	50.4	40.3	9.4
S5	My teachers teach science and mathematics in English	26.8	49.3	23.9
S6	I always speak to my teacher in English	51.3	41.8	7.0
S7	I could understand English very well when reading science text books	28.3	58.7	13.0
S8	When my teacher asks a question, I will think in Malay language before giving the answer in English	6.1	30.3	63.5
S10	I think it is difficult to learn science and mathematics in English	21.0	30.8	48.2
S11	Learning science in English is harder than learning mathematics in English	18.3	38.1	43.6

The respondents were also likely influenced by their daily spoken language as majority of them will think in Malay language before giving the answer in English (Item S8). This could be the reason why their teachers do not fully teach science and mathematics in English (Item S5).

*iv Students attitude towards the usage of English language*

**Table 4: Students’ opinion of English usage in everyday life**

Items	Statements	Disagree(1)	Not Sure(2)	Agree(3)
S3	I always speak English at home	61.9	33.1	5.0
S13	I like to read the Malay subtitle when watching television of English programs to understand better	5.0	13.3	81.7
S14	I like to read the Malay story books rather than English story books	6.1	28.7	65.2

Language is an important part of social culture (Lawton, 1989). Learning process will be effective if teachers know how to make use and describe appropriate examples of everyday life phenomena in their teaching. Simple and appropriate level of language should be used to explain the everyday life phenomena which related to scientific and mathematical concepts, in order to motivate students to understand better. However, as indicated in Table 4 revealed that majority of the respondents either hardly or seldom use English language at home (Item S3) and they used to speak their mother tongue language at home. This was supported by the facts that they like to read the Malay subtitle when watching television of English program to understand better (Item S13) and they also like to read the Malay story books rather than English story books (Item S14).

From the above examples, it is clear that the respondents prefer to use Malay language as a medium of instruction. These practices may become obstacles to the respondents in learning and understanding the contents of science and mathematics in English language.

Students attitude towards an academic discipline are recognized as being significant in determining success in learning. Table 5 indicates a statement of students’ motivation with regards to the important of English language in learning and in everyday life. Majority of the students felt that English language is very important for their future careers (Item S12), however they still preferred to learn science and mathematics in Malay language (Item S9) as majority of the respondents agreed to the statement that learning science and mathematics in Malay language is easier and more likely to be understood (Item S16).

The choice of Malay as a medium of instruction in learning science probably due to their own everyday language that make them easier to understand better of the subjects. In spite of preferring to learn science and mathematics in Malay, they showed positive attitude towards the important of English language as majority of the respondents (83.9% of Item S15) agreed

to the statement that they will refer to dictionary if they do not understand English words or terms.

**Table 5: Students' felt needs for English**

Items	Statements	Disagree(1)	Not Sure(2)	Agree(3)
S9	I like to learn science and mathematics in Malay language	7.9	17.1	75.0
S12	English is important in career path	6.5	20.1	73.4
S14	I like to read Malay story books rather than English story books	6.1	28.7	65.7
S15	I will refer to the dictionary if there is any word(s) in English that I didn't comprehend	2.9	13.2	83.9
S16	Learning science and mathematics in Malay language is easier and more likely to be understood	3.6	14.7	81.7

v *Correlations among students' test performance of English, Mathematics and Science subjects*

**Table 6: Correlation of students examination results for English, Mathematics and Science subjects**

	UPSRMAT	UPSRSC	MTING	MTMAT	MTSC
UPSRING	0.57*	0.57*	0.62*	0.48*	0.35*
UPSRMAT		0.76*	0.51*	0.60*	0.34*
UPSRSC			0.42*	0.52*	0.40*
MTING				0.52*	0.42*
MTMAT					0.43*

**Note:**

\* indicates the significant (p) level at 0.01

- UPSRING:** UPSR English Result
- UPSRMAT:** UPSR Mathematics Result
- UPSRSC:** UPSR Science Result
- MTING:** English Monthly Test Result
- MTMAT:** Mathematical Monthly Test Result
- MTSC:** Science Monthly Test Result

The results in Table 6 show that the correlations between UPSR English language and English, Mathematics and Science monthly test are 0.62, 0.48 and 0.35 respectively, while the correlations between English monthly test results and Mathematics and Science monthly test are 0.52 and 0.42 respectively. These results seem to indicate that respondents who were high in English were more likely to achieve high scores in their English, Mathematics and Science tests. In other words, the findings reveal that English language is one of several factors that contribute to the respondents' performance of science and mathematics.

## **CONCLUSION**

The study has established the following:

- i. The students considered English as an important subject to learn and it was useful for everyday communications and as a tool for learning science and mathematics.
- ii. The students felt that learning science and mathematics in English were difficult, however to learn science was more difficult compared to learn mathematics in English
- iii. The study showed that there was a significant correlation between UPSR English result and other subjects monthly test results, such as English, Mathematics and Science.
- iv. Science subject has been found to be more affected by the implementing of teaching science and mathematics in English.

The results of this study described what have happening in the schools regarding the implementation of English language in learning science and mathematics. Students have encountered language problems as well as contents' problems and to overcome these problems they need help and guidance from the teachers. Emphasized should be given more on building up students proficiency in English before they could learn science and mathematics effectively.

## **REFERENCES**

- Aziz bin Nordin (1992). Matematik sebagai asas untuk mengikuti kursus kejuruteraan. *Prosiding Simposium Kebangsaan Sains dan Matematik Ke V*, Universiti Teknologi Malaysia, 20-22 Disember, 1992.
- Aziz bin Nordin (2003). Peranan bahasa dalam pembelajaran kimia. *Buletin Persatuan Pendidikan Sains dan Matematik Johor*, Jil. 12, Bil. 1, pp. 59 - 64.
- Bloom, B. S., (1976). *Human characteristic and school learning*. New York : Mc Graw Hill.
- Eckstein, S. G. dan Shamesh, M. (1993). Development of children's ideas on motion : Impetus, the straight-down belief and the law of support. *School Science and Mathematic*, Vol. 93, No. 6.
- Evans, C. (1978). *Psychology, a dictionary of the mind, brain and behaviour*, Arrow Books Ltd., London.
- Gilbert, J. K., Osborne, R. J. dan Fesham, P. J (1982). Children's science and its consequences for teaching. *Science Education*, Vol. 66, No. 4, pp. 623-633.
- Ihejieta, D. O. (1995). Parallelism in performance and the multifactor perspective to the instructional process – a case study of poor achievements in mathematics in a single-sex school setting. *Int. J. Math. Educ. Sci. Technol.*, Vol. 26, No. 4, pp 559-565.
- Lawton, D. (1989). *Education, Culture And The National Curriculum*. Hodder and Stoughton, United Kingdom.
- Osborne, R. J., Bell, B. F. dan Gilbert, J. K. (1983). Science teaching and children's views of the world. *Eur. J. Sci. Educ.*, Vol. 5, No. 1, pp. 1 - 4.