READINESS OF YEAR 1 STUDENTS TO LEARN SCIENCE PROCESS SKILLS IN ENGLISH: A MALAYSIAN EXPERIENCE

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The Malaysian Ministry of Education has implemented the use of English as the medium of instruction at primary school level beginning 2003. These students are the main group of people affected by this change in policy. Besides, the implementation of the approach also raises the readiness of students in the rural areas. Therefore, the aims of the study are a) comparing between year 1 students from the urban and the rural areas in terms of their competency of science process skills which use English terminologies, and b) determining the level of readiness of year 1 students in learning the science process skills in English for Science subject. The study adopted a quantitative research method design to make a comparison between Year 1 students in the rural and urban areas and to determine the level of readiness. The research findings show that there is a significant difference between year 1 students in rural and urban in term of communication skill, classification skill and observation skill. The findings from this study could contribute to the improvement of pedagogical practices in teaching Science in primary school.

Key Words: science process skills, readiness of students, primary school level, English as medium of instruction

INTRODUCTION

Science education at the primary level is the basis of preparing human capital that is capable of achieving Vision 2020. The government and the Ministry of Education (MOE) in particular have carried out various programmes to ensure

the next generation fulfils the needs of the nation, competitive and achieving world class standards. Critical, innovative and scientific thinking will be able to ensure the economic development and the progress of the nation.

Hence, in an effort to make the Malaysian's education system a world class education, in the year 2003 the Malaysian Ministry of Education (MOE) implemented the teaching of Science and Mathematics in English for Year 1, Form 1 and Form 6 students. English is an international language. The skills and competency in English are crucial assets for students to access various kinds of fields which are continuously expanding. Besides, the competency in English would facilitate the nation's young generation to face the challenges of globalization and information which is abundant in today's world. The focus is no longer limited to students' knowledge and skills but today also incorporates the overriding aims of the national curriculum, which are often related to the students' personal development (Malm & Lofgren, 2006).

Such new educational change policies generally rest on assumptions about and thereby define change and improvement in school, teaching and student achievement (Popekewitz, 2000). Many researchers emphasise the inner qualities of schools, ethical norms and classroom climate as important predictors of students' development and achievement, as well as for the maintenance of effective schools (Rutter, 1983; Grosin, 1991, 2004; Scheerens and Bosker, 1997). Differences in students achievement and social adaptation are still described with reference to social and ethnic background and intellectual capacity (Grosin, 2004).

The pedagogy of teaching Science in English will have an impact on the students. The students' ability in obtaining and communicating with the teacher during the teaching and learning process will influence the effectiveness of the teaching of this subject. Wellington and Osborne (2001) stated that the role of language in mediating science content. It is worrisome that students start to lose interest and confidence to learn science because it is considered difficult and taxing. According to Suffolk (2005), teacher and student must be confident in giving opinion in the language that is used as the medium of instruction. Moreover students' level of preparation and acquisition towards learning Science in English must be taken into account. This is a vital aspect due to the fact that students will be the one experiencing the biggest impact of this policy.

Statement of Problem

To ensure a plan of a modification or changes to be successful, the planner has to affirm that students are ready to accept the idea. According to Sharifah Maimunah Syed Zain (2003), three groups will emerge when changes are

implemented; those who accept, refuse to accept and, those who do not accept or refuse (neutral). Since the suggested changes from MOE is quite drastic, the preparation of students in accepting these changes can be seen in three different aspects; those who support the changes, those who resist and those who neither support nor resist. Students who support the idea are those who are ready to accept the English approach. They believe that they can be more successful if the medium of instruction is in English. They are more confident and comfortable to communicate in English. However, students who refuse are those who are not ready and to feel inferior to participate in this type of teaching. Whereas, students who neither support nor resist believe that English usage is important but they are not ready to participate.

According Massa (2004), for teachers who are teaching in urban schools, there is a possibility among the students whose high socio economy background that can supersede their teachers' language proficiency. On the contrary for rural schools, the poor standard of their students' English proficiency will make the teaching and learning process much harder. As the Council of Chief State School Officers (CCSSO) adds to the definition of English language proficiency by identifying English proficient students as;

> "having a language background other than English and his or her proficiency in English is such that the probably of the student's academic success is an English-only classroom is below that of an academically successful peer with an English background."

(1992, p.7)

Objective of the Study

The purposes of this study are:

a) To compare the competency in mastering the science process skills using English terminology in Science between Year 1 students in the rural and urban areas

b) To determine Year 1 students' level of readiness to learn the science processes skills regarding the usage of English in Science subject

Research Questions

The main questions of this study are:

a) Is there a significant difference between Year 1 students in the rural and urban areas in terms of their competency in mastering the science process skills using English terminologies in Science?

b) What is the level of Year 1 students regarding the readiness in learning the science process skills in English?

METHOD

Research Design

This study used quantitative research design which is a descriptive comparison. Wiersma (2000) states that descriptive research can be used to collect data or information for the purpose of planning and as a guidance to analyse relation or comparing between variables in a research. The research design is coherent with the first research objective which is to observe the required terms or concepts in science for the Year 1 students and in this regards, it is done by making a comparison between Year 1 students in the rural and urban areas in terms of their competency in mastering the science process skills. In addition, the research design facilitated the combination of all data collection in order to answer the second research question, which is to evaluate the Year 1 students' level of readiness to participate in the learning process.

Sample

A total of 5 schools from the urban area and 6 schools from the rural area were selected randomly for the data collection of the research. They were believed meeting the required criteria and the representative of the given population. The urban area schools were selected from Selangor and the rural area from Negeri Sembilan. The purpose of selecting these two states was to obtain an intact data and more accurate sample representative. 257 Year 1 students were involved in this study. 118 students represented the urban area while 139 represented the rural area.

Research Instrument

This study used an evaluation test instrument to assess the student's level of readiness which is called "Year 1 Student Level of Readiness for Science Subject Evaluation Test", and it is therefore answered the second research question. Prior to that, the first research question was answered by examining

each of the two components included in this instrument: Component 'A' and 'B'. Component 'A' examined the science terminologies or concepts. It contained 6 questions on this which require the respondents to answer about the human body, physical substances, colour, shapes, taste of food and function of human's sense. In regard to measure the particular aspect of science process skills, Component 'A' also consisted of a question on communication skill, two questions on classification skills, and three questions on observation skills.

Whereas Component 'B' examined animal names, the physical aspects of a fish, animal movements, names of plant, labelling plant's component, shapes, and the concept of sinking and floating. Component 'B' also consisted several questions measuring science process skills such as two questions on communication skills, two questions on classification skills, three questions on observation skills, and one question on inference skill.

Validity and Reliability of the Research Instruments

The validity of an instrument refers to the extent of the tool measures appropriate data. It is required to measure and enable findings of suitable interpretation of score   (Mohd Majid Konting, 2004). To ensure the validity of the instrument's content, the researcher consulted 3 teachers who have more than 10 years of experience in teaching Year 1 students. Suggestions and comments from these teachers were the basis in modifying the instrument. Regarding the reliability of the instrument, the researcher has conducted a pilot research which involved 36 Year 1 students before conducting the actual research. Eventually the the Cronbach alfa value was 0.72 for the whole instrument item. According to Ary, Jacobs and Razavien (2002) the value of reliability which exceed more than 0.50 can be accepted if the research results are only used for research purposes.

FINDINGS

This section presents the findings that correspond to the research questions of this study.

Comparison of Science Process Skills between Year 1 students in the rural and urban areas

Table 1. Maximum score, Means, Standard Deviation, and t value of communication skills

Science Process skills (Communication)	Score Max	Urban Mean /S.D	Rural Mean/ S.D	t-value (2-tailed)	Sig. P< .05
Communication a.1 (Our Body)	10	8.90/1.72	4.32/3.67	12.41	.000*
Communication b.2 (Animal names)	5	3.99/1.03	2.42/1.79	8.36	.000*
Communication b.3 (Parts of Animal Body)	4	3.73/0.63	2.46/1.56	8.25	.000*

*Significant at 0.0001

Table 1 shows the result of t-test of communication skills for the urban and rural Year 1 students. The results indicate that there is a significant difference between the mean of mastering the science process skills using English terminology in Science between Year 1 students in the rural and urban area. For communication a.1 (our body), t value = 12.41 at the level of significant p<0.05. Whereas, the t value = 8.36 for b.2 (animal names) and t value = 8.25 far b.3 (parts of animal body). The t value is significant at the level of significant p<0.05

Table 2. Maximum score, Means, Standard Deviation, and t value of classification skills

Science process skills (Classification)	Score Max	Urban Mean/S.D	Rural Mean/S.D	t value (2- tailed)	Sig. p < .05
Classification a.2 (Hear and taste)	5	3.86	3.63	2.47	0.14
Classification a.4 (Shape)	5	4.74	4.49	3.22	0.01*
Classification b.1 (Animal names)	5	4.67	2.86	9.45	0.00*
Classification b.7 (Shape)	7	5.89	5.84	5.84	0.49

 *Significant at 0.001

According to Table 2, there are significant differences between the mean of urban and rural area in term of shapes and animal names. For Classification a.2 (hear and taste), t value = 2.47 shows the non significant result due to the fact

that the level of significant is p<0.05. For the Classification a.4 (shape) with t value = 3.22, the difference is significant (p<0.05). Classification b.1(animal names) shows t value = 9.45 which is also significant (p<0.05). Classification b.7 (shape) shows the non significant difference with the t value = 0.72, (p<0.05).

Table 3. Maximum score, Means, Standard Deviation, and t value of observation skills

Science process skills (Classification)	Score Max	Urban Mean/ S.D	Rural Mean/ S.D	t value (2- tailed)	Sig. p < .05
Observation a.3 (Colour)	6	5.44	1.98	17.28	0.00*
Observation a.5 (Taste)	7	3.36	3.16	0.78	0.43
Observation a.6 (Our sense)	8	5.72	2.64	8.85	0.00*
Observation b.4 (Animal movements)	4	3.44	2.00	8.01	0.00*
Observation b.5 (Parts of plants)	4	2.64	2.02	3.42	0.01*
Observation b.6 (Names of plants)	5	3.86	2.20	7.43	0.00*

 * Significant at 0.001

With reference to the observation skill used by students in the urban and rural area, Table 3 shows that for Observation a.3 (colour) t value = 17.28 indicated that there is a significant difference between the mean of urban and rural area. Observation a.5 (taste) t value = 0.78, is not significant with the value of p<0.05. For Observation a.6 (our sense) t value = 8.85, Observation b.4 (animal movements) t value = 8.01, Observation b.5 (parts of plants) t value = 3.42 and Observation b.6 (names of plants) t value = 7.43, all have a significant difference value of p<0.05.

Table 4. Maximum score, Means, Standard Deviation, and t value of predicting skill

Process science skill	Score Max	Urban Mean/S.D	Rural Mean /S.D	t value (2- tailed)	Sig. p < .05
Predicting b.8 (Float and sink)	8	4.77	4.9	-.42	.66

Table 4 shows the result of t test for predicting skill. The score in table 4 above shows the non significant difference between the mean of urban and rural area. (t = -.42, p<0.05)

Table 5. Maximum score, Means, Standard Deviation, and percentage of process science skill

	Numbers of sample (n)	Maximum	Mean	Std. Deviation	%
Communication skill	251	19.00	12.76	5.96	67.2
Classification skill	233	20.00	18.06	2.30	90.3
Observation skill	207	34.00	19.91	8.81	58.6
Predicting skill	236	8.00	4.84	2.46	60.5

Table 5 shows the responses given by all the students. For communication skill, 67.2% of students were able to acquire the skill. The maximum score is 19.00, with a mean = 12.76 and a standard deviation = 5.96. Almost all students, with a total of 90.3% were able to acquire the classification skill. The maximum score for classification is 20, mean = 18.06 and a standard deviation = 2.30. Table 5 also shows the frequency that 58.6% of students were able to acquire the observation skill with maximum score of 34, mean = 19.91 and a standard deviation = 8.81. Lastly, for the predicting skill a total of 60.5% students were able to acquire this skill with a maximum score of 8, mean = 4.84 and the standard deviation = 2.46.

DISCUSSION AND CONCLUSION

In this research, four science process skills were identified which are communication, classification, observation and prediction. Three questions were used in communication skill which shows distinguished difference between the urban and rural students. Study shows that students in the urban area were excellent in acquiring the communication skill in English.

This is due to the readiness of the students to accept the teaching approach which will be influenced by the language that is being used in the teaching and learning process. If the language is understood and the information process period is short, students will give more attention to the subject. According to

Nor Hasimah (2007), if the language that is being used is difficult to understand, the receiver/listener would interpret it in two stages. The first stage is to understand the language and translate it to an understandable language and the second stage is to interpret it.

For the classification skill, from the four questions that have been constructed, two questions are about the significance in difference between urban and rural students. For this skill, students need to be aware of the shared characteristics in a subject or object that were compared. They need to match the shared / same characteristics with the general characteristics that have been observed. Therefore students need to be exposed to the object of their surrounding in order to be more sensitive and aware in doing the comparison. In the learning process, students should be given the chance to compare and determine shared / same, and different characteristics.

Another skill that has been studied is the observation skill. This skill is a basic of science process skill for primary students. Six questions were constructed to study the students' competency in this type of skill. Five of the questions indicate clear significant differences between urban and rural students. To overcome this weakness, teachers need to make the learning process from the lower stage more interesting by using real-life objects in the learning. Students in this level may not yet ready to receive an abstract approach of learning. Therefore it is essential that the teachers' approach should involve real-life objects which the students can directly touch, feel, smell, and see.

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