HOW MANAGEMENT STUDENT DISSEMINATING KNOWLEDGE THROUGH MATHEMATICS

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Every person gives different perspective on mathematics. Perspective comes from feelings. Fascination, love, bored, hate are several colours of feelings. We can express our feelings by drawing an image. Images can evoke powerful imagery that helps us interpret and disseminate knowledge by exchanging information and perspectives. Images of mathematics are important elements for knowing about students' knowledge on mathematics and mathematics learning. Every student has different background of education which is shaped by different experiences throughout their lives especially when studying mathematics. Hence, this paper discusses the general views of images of mathematics held by students of the Management Bachelor Program at a higher education institution. Eighty students from the third semester were selected in this study. Data were collected qualitatively and analysed quantitatively through images which are drawn by student based on the theme of 'Mathematics and I', related to the students' views of the nature of mathematics.

Keywords: images, nature, feelings, disseminate.

1.0 Introduction

Mathematics is a discipline that has unique characteristics. Everybody has some mental image (Furinghetti 1993) of it whereby the discipline may be loved or hated, be understood or misunderstood or any kind of feelings.

Research on images of mathematics have been garnered wide attention and have found that the teacher is a key factor in shaping the attitude and beliefs of students regarding mathematics and mathematics learning (Chen & Arvold, 2003; Goodwin, 2007; Lim, 1999; Picker & Berry, 2000). The various images of mathematics held by students were found to be related to students' experiences while learning mathematics. Images of mathematics are important elements for knowing about students' perception on mathematics and mathematics learning. Rock and Shaw (2000) explained that the process of mathematics education will become more challenging if the images of mathematics is perceived as negative.

Lim (2012) stated that school mathematics curriculum of many countries in the world are very concern with how character could be moulded. Disseminating values in teaching and learning (Nik Azis 2009; Bishop 2007; Seah 2011) is one of the good solution for this problem. There are various categories of intrinsic values embedded in mathematics education. It is possible to disseminate positive values and thus develop positive characters among our future generation by mindful integration into teaching and learning of mathematics.

Mathematics education in Malaysia involves preschool level until university level. Tertiary level of education also known as postsecondary education (Picker & Berry 2000), is

academic pursuit undertaken beyond high school involves certificates, diplomas, associate's, bachelor's, master's and doctoral degrees. Among the bachelor's degree programs offered by most higher learning institutions is the Bachelor in Management. The program objective is to produce graduates who are skilled and knowledgeable in evaluating and describing various issues and problems related to finance, accounting, business and human resource administration.

There are various ways of inculcating values in mathematics teaching and learning so as to promote positive character. It can be done either implicitly or explicitly (Rokiah 1998; Lim et.al 2003); during the process of teaching or discussion; using individual or group activities; at various levels from pre-school to tertiary level.

2.0 Objectives

This paper explores images which can provide information on the students' perception on mathematics. Thus, this study is hopingly considered to give some contribution to the effort to develop a holistic conception in mathematics education from the perspective of students.

3.0 Methodology

The study examined the conception of mathematics held by students of the Bachelor of Management program in one of a university in Malaysia. For the images of mathematics learning, participants were asked to draw a picture about their perception on mathematics. The picture or figurative representation should depict what the participant feel about mathematics. After finishing the drawing, participants were asked to explain in words all the important points they wanted to convey in their drawing. Details of the drawing related to the images formed were analysed quantitatively based on the category; positive, neutral and negative.

4.0 Findings and Data Analysis

Eighty participants were involved in this research by drawing an image with the theme of 'Mathematics and I'. 74% were female students and the remaining 26% were males.
The grade for Modern Mathematics in the Sijil Pelajaran Malaysia (Malaysian Certificate of Education) of the participants were A (76%), B (23%) and C (1%). Table 4.1 shows the details by gender regarding to the grade for Modern Mathematics.

Table 4.1 Background Information

Gender	SPM Grade (Mathematics)			Total	
	A	B	C		
Male	13	7	1	21	(26%)
Female	48	11	0	59	(74%)
Total	61	18	1	80	
	(76%)	(23%)	(1%)		

Details of the drawing related to the images formed were analysed quantitatively. Interpretation given to the image drawn by each student gives information with three categories; positive, neutral (medium) and negative (refer Table 4.2).

Table 4.2 Images of 'Mathematics and I'

Gender	Images of 'Mathematics and I'			Total	
	Positive	Neutral	Negative		
Male	6	8	7	21	(26%)
Female	31	20	8	59	(74%)
Total	37	28	15	80	
	(46%)	(35%)	(19%)		

Table 4.3 Images of Male Student in Learning Mathematics

SPM Grade	A			B			C		
Image	Positive	Neutral	Negative	Positive	Neutral	Negative	Positive	Neutral	Negative
Frequency	5	7	1	1	1	5			1
Total		13			7			1	

Table 4.4 Images of Female Student in Learning Mathematics

SPM Grade	A			B			C		
Image	Positive	Neutral	Negative	Positive	Neutral	Negative	Positive	Neutral	Negative
Frequency	30	14	4	1	6	4	0	0	0
Total		48			11			0	

The findings give us information that 46% of student has positive perception on mathematics while 35% are neutral (refer to Table 4.2). Images of mathematics which was perceived as negative (19%) need action from mathematics teachers and lecturers to think seriously how to attract student enjoy studying mathematics. The negative perception as what Rock and Shaw (2000) explained before will make the process of teaching and learning mathematics become more challenging.

The positive image was produced from drawing of a sun, flower, smile face, smiley object and other kind of positive drawings. Figure 4.1 and Figure 4.2 are two examples of positive images drawn by student. Most of medium or neutral image of mathematics came from drawing of environment or event like a human who is fishing, a river flow, climate

change etc (refer Figure 4.3 and Figure 4.4). While negative image was interpreted from drawing of stressful and confused face which shows that mathematics gives burden to student (refer Figure 4.5 and Figure 4.6).

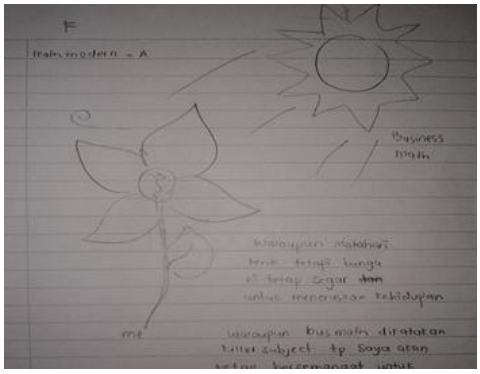

Figure 4.1: Positive Image of Drawing by a female

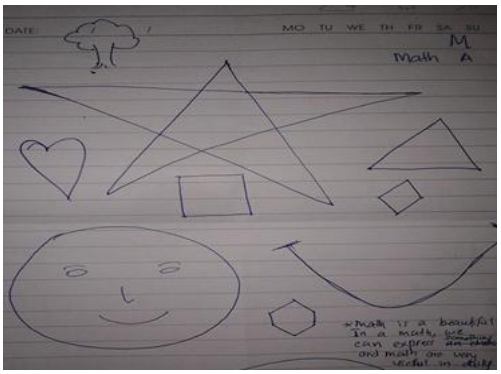

Figure 4.2: Positive Image of Drawing by a male

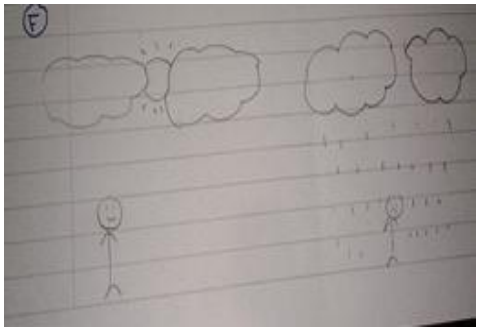

Figure 4.3: Neutral Image of Drawing by a female

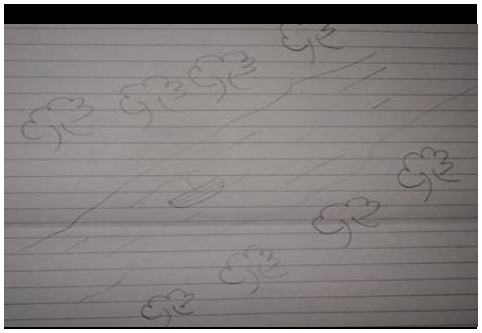

Figure 4.4: Neutral Image of Drawing by a male

Figure 4.5: Negative Image of Drawing by a female

Figure 4.6: Negative Image of Drawing by a male

5.0 Discussion and Conclusion

Teaching and learning of mathematics are cultural activities and thus are not really value-free. There are various categories of values in mathematics education. With careful and mindful integration into teaching and learning of mathematics, it is possible to disseminating positive values and thus develop positive characters of our future generation. It takes a long time and enormous efforts for the lecturer to prepare a good lesson that can fulfil this goal. Sometimes what is planned might not be what is implemented. Besides time constraint, cultural beliefs and university culture and philosophy could also affect the way of teaching.

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