

INTEGRATING EMOTIONAL INTELLIGENCE IN CURRICULUM: DO FEMALE STUDENTS PERFORM BETTER THAN MALE STUDENTS?

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Abstract

The study examined the effects of integrating emotional intelligence on students' performance in Mathematics across gender. Focus was on the Mathematics subject at the lower secondary level in Malaysia. A total of 123 students were involved as research participants; 61 males and 62 females. The participants received classroom instruction which integrates emotional intelligence. Data were collected over a period of nine weeks. A pre-test was conducted in the first week followed by seven weeks of instruction. A post-test was carried out in the final week. The Mathematics Achievement Test Multiple Choice Item (MATMI) and Mathematics Achievement Test Subjective Item (MATSI) were used as instruments to measure students' achievement in the subject. Data collected were analysed using ANCOVA and MANCOVA. Generally, research results failed to prove that the effect of integrating emotional intelligence in teaching and learning process on students' Mathematics performance were different across gender.

Keywords *Emotional intelligences; gender; students' performance*

Abstrak

Kajian ini telah mengenal pasti kesan pengintegrasian kecerdasan emosi ke atas pencapaian murid dalam Matematik mengikut jantina. Fokus kajian adalah ke atas mata pelajaran Matematik di peringkat menengah rendah di Malaysia. Sejumlah 123 murid terlibat sebagai sampel kajian; 61 lelaki dan 62 perempuan. Sampel kajian telah menerima pengajaran yang mengintegrasikan kecerdasan emosi. Kajian telah dilaksanakan selama sembilan minggu. Pada minggu pertama diadakan praujian diikuti dengan pengajaran selama tujuh minggu. Pascaujian diadakan pada minggu terakhir. Mathematics Achievement Test Multiple Choice Item (MATMI) dan Mathematics Achievement Test Subjective Item (MATSI) telah digunakan sebagai instrumen untuk mengukur pencapaian murid dalam mata pelajaran Matematik. Data telah dianalisis menggunakan ANCOVA dan MANCOVA. Secara umumnya, dapatan kajian gagal membuktikan bahawa kesan pengintegrasian kecerdasan emosi dalam pengajaran dan pengajaran ke atas pencapaian murid dalam Matematik berbeza mengikut jantina.

Kata kunci *Kecerdasan emosi; jantina; pencapaian murid*

INTRODUCTION

Attention has been given to gender differences in education. With naturally difference in hormones levels, males and females react differently to similar situations. Males and females differ in interests, respond to problems in different ways, and are different in some skills. For example, females may stronger in verbal skills but males are better in spatial skills.

BACKGROUND OF STUDY

Today's children are facing complex challenges of global competition. This situation has increased the likelihood of mental health problems among young generations. Emotional intelligence has an important role to reduce these mental health problems. It is acknowledged that the increasingly demand of emotional intelligence as an important aspect to be built among adolescence is due to the increasingly challenges faced by them in their social life. (Ross, 2000 cited in Fer, 2004). Through planned approaches in curriculum, it is not impossible to produce a generation of students who are able to face the encroaching challenges of globalization.

Researchers have found that one's emotional awareness and ability to handle feelings rather than I.Q. will determine success and happiness in life. According to Payton et al. (cited in Pasi, 2001), research findings showed that curriculum instructions which focus solely on academic aspect failed to assist students as responsible, caring and competent learners. It shows that emotional and intellectual aspects are linked and complement each other. Hence, in the process of teaching and learning, emotional aspect should not be neglected in order to prepare future generations who are able to manage themselves although critical challenges would be forthcoming.

PROBLEM STATEMENT

Generally, studies had shown that there were significantly positive relationship between emotional intelligence and students' academic achievement (Drago, 2004; Lam and Kirby, 2002; Rimm-Kaufmann, 2006; and Maria Chong Abdullah, Habibah Elias, Rahil Mahyuddin and Jegak Uli, 2004). While Aber, Pedersen, Brown, Jones and Gershoff (2003) and Rimm-Kaufmann (2006) reported that emotional intelligence programmes had successfully increased students performance in Mathematics. Referring to achievement in Mathematics, studies showed that the factors influenced include anxiety, attitudes, motivation, the concept of mathematics assessment, teachers' teaching methods, self control and gender (Effandi Zakaria & Norazah Mohd Nordin, 2008; Evans, 2007; Okigbo & Osuafor, 2008). Alkhateeb (2001) found out that female students scored higher in Mathematics compared to the male students. On the contrary, studies by Bessoondyal (2005); Dmitrieva, Zaitzeva and Orlov (2003); and Tella (2007) showed that male students scored higher in Mathematics compared to female students.

Since there are differences among males and females in certain aspects of life, they may approach the process of learning from different viewpoints. In education, it is important to ensure that the curriculum implemented will give benefit to both genders.

To develop effective integrated curriculum, the influence of gender as variables in the classroom should be taken into consideration. Thus, the purpose of this study is to investigate the effect of emotional intelligence learning on students' performance in Mathematics across gender.

RESEARCH HYPOTHESIS

The null hypotheses of the study are as follows:

- Ho1 : There is no significant difference in the adjusted mean score of the overall Mathematics achievement between the group of female students and the group of male students who received classroom instruction which integrates emotional intelligence.
- Ho2 : There is no significant difference in the adjusted mean score of Mathematics Achievement Test Multiple Choice Item (MATMI) between the group of female students and the group of male students who received classroom instruction which integrates emotional intelligence.
- Ho3 : There is no significant difference in the adjusted mean score of Mathematics Achievement Test Subjective Item (MATSI) between the group of female students and the group of male students who received classroom instruction which integrates emotional intelligence.

LITERATURE REVIEW

The term emotional intelligence was first introduced by Salovey and Mayer in 1990. Salovey and Mayer (1990) defined emotional intelligence as "the subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions." This idea is related to Gardner's idea relating to intrapersonal and interpersonal intelligences. According to Gardner, interpersonal intelligence involves the capacity to understand the intentions, motivations and desires of other people. While intrapersonal intelligence involves the capacity to understand oneself, to appreciate one's feeling, fears and motivations. In 1997, Salovey and Mayer revised their earlier work and the new model introduced consists of four branches namely perceptions, appraisal and expression of emotion; emotional facilitation of thinking; understanding and analyzing emotion; and reflective regulation of emotion.

Is emotional intelligence important? Brearley (2001) confessed that, "Emotional intelligence is a powerful process of raising achievement for all children throughout the age and ability range" (pg. 87). Bocchino (1999) had highlighted on emotional literacy as a key factor in predicting one's future success. This indicates that emotional intelligence is an important aspect in determining one's success not only in school but in future life. Goleman (1995, 1998) claimed that Intelligence Quotient (IQ) contributes only about 20% of success in life; another 80% by Emotional Quotient (EQ). To success in life, one should possess not only knowledge but a combination of a number of intelligences and skills. Emotional intelligence also plays an important role as a compliment to intellectual intelligence towards one's success and excellence.

An emotionally intelligent person will afford to manage change confidently and able to deal with difficult situations in the best possible ways. An emotionally intelligent person are also creative as being able to consider situations from different perspectives and thus take into consideration a variety of possible solutions in solving problems successfully as they arise. Thus, the issue of emotional intelligence has elicited interest among researchers to conduct studies related to emotional intelligence.

How to integrate emotional intelligence in the curriculum? According to Goleman, 1995; Pasi, 2001; Weare, 2004 emotional intelligence can be integrated into the existing curriculum. Hence, teachers should be creative to plan strategies, activities and learning environments that can promote students' emotional intelligence without neglecting the knowledge and skills of the subject that students should acquire. In any innovation, gender discrimination should be avoided to grant gender equality in education. Lloyd, Walsh and Yailagh (2005); Mubark (2005); Mullis, Martin, Fierros, Goldberg and Stemler (2000); and Olson (2002) found out that the effect of certain treatment on students' academic achievement were different across gender. However, Ornstein dan Hunkins (2009) emphasized that schools should not discriminate students according to gender.

Previous studies showed that there exists difference in Mathematics achievement across gender (Alkhateeb, 2001; Bessoondyal, 2005; Dmitrieva et al., 2003; Tella, 2007). Studies by Alkhateeb (2001) found that female students scored higher in Mathematics compared to male students. In contrast, Bessoondyal (2005); Dmitrieva et al., (2003); and Tella (2007) reported that male students scored higher in Mathematics compared to female students. Lloyd, Walsh and Yailagh (2005) had studied about sex differences in performance attribution, self-efficacy and achievement in Mathematics. The results showed that girls' mathematics achievement met or exceeded that of boys. Results also indicated that girls were more apt to display under-confidence relative to their actual mathematics achievement and to attribute mathematics failure to a lack of teachers' help than were boys.

O'Brien, Martinez-Pons and Kopala (1999) investigate the relationship of Mathematics self-efficacy, ethnic identity, gender and career interests to Mathematics and Science. The samples consisted of 415 11th-grade students, 221 boys and 194 girls. The results showed that gender directly predicted students' career interests in science and engineering. A study was carried out by McCoy (2005) to investigate the effect of demographic and personal variables on students' achievement in eighth grade algebra. The samples were 107 eighth grade students, 46 males and 61 females. The results showed that the effects of gender on students' end-of-course test scores and end-of-grade test scores in algebra were not significant. Therefore, it can be concluded that previous studies revealed inconsistent results.

METHODOLOGY

This study uses quasi-experimental design and it was conducted over a period of nine weeks. The samples were Form 2 students in secondary school in Malaysia. A total of 123 students were involved; 62 males and 68 females. Pre-test was administered to both groups in the first week of the study. From the second week to the eighth week

both groups receive classroom instruction which integrates emotional intelligence. Post-test was administered to both groups on the ninth week.

Lesson plans for eight weeks were prepared by researcher. For each lesson plan, emotional intelligence aspects were integrated during the process of teaching learning. The lesson plans were validated by three lecturers; two lecturers who are specialized in Mathematics and a lecturer specialized in Educational Psychology. Students' achievement in Mathematics consists of three forms: achievement in objective multiple choice test, achievement in subjective test and overall achievement. Two instruments were used in the study. Mathematics Achievement Test Multiple Choice Item (MATMI) and Mathematics Achievement Test Subjective Item (MATSI) were used to assess students' achievement in objective multiple choice items and subjective items respectively. MATMI and MATSI were developed by researcher. Three topics were included in the tests i.e. Coordinates, Loci in Two Dimensions and Circles. These were the topics taught during the period of study.

MATMI consists of objective items with four options each; 1 mark is given to each correct answer and 0 mark to wrong answer or unanswered item. The total marks calculated will be the students score in MATMI. MATSI consists of subjective items; 2 or 3 marks assign to each item. Students' answers were marked by two independent markers. The mean scores calculated will be the students score in MATSI. The overall Mathematics achievement were obtained by adding the scores in both tests with the weightage of 40% and 60% on MATMI and MATSI respectively.

The internal consistency reliabilities of both instruments were determined by a pilot test administered to a group of students who were not involved in the research treatment. The internal consistency reliability of MATMI is .801 while the internal consistency reliability of MATSI is .917. Test retest was administered to determine the stability of both instruments and the correlation coefficients are .838 and .969 for MATMI and MATSI respectively.

DATA ANALYSIS PROCEDURE

The data were gathered from the two groups of samples, male students and female students, during pre-test and post-test. Inferential statistic were analysed by employing SPSS software. In choosing the classes involved in the study there was no random selection among the students; it was based on intact group instead i.e. all the students, male and female, in the chosen classes were assigned as the sample of study. This causes difficulty in controlling the difference of group samples at the beginning of the study. Thus, to statistically equate the groups, analysis of covariance (ANCOVA) and multivariate analysis of covariance (MANCOVA) were used.

The use of MATMI and MATSI as instruments in pre-test and post-test will cause ceiling effect i.e. students with very low scores in pre-test have better opportunity to show higher gain score, whereas students with very high scores in pre-test have only small opportunity to show better gain score. The latter phenomenon is known as ceiling effect. The use of ANCOVA and MANCOVA afford to solve the problem associated with gain score.

DATA ANALYSIS

Ho1 : There is no significant difference in the adjusted mean score of the overall Mathematics achievement between the group of female students and the group of male students who received classroom instruction which integrates emotional intelligence.

The result of the Levene test is as shown in Table 1.

Table 1 Levene Test of Overall Mathematics Post-test Achievement

Dependent Variable: Overall Post-test Achievement

F	df1	df2	Sig.
3.486	1	121	.064

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a Design: Intercept+pretotal+gender

Table 2 shows the adjusted mean scores of male and female students on overall Mathematics achievement.

Table 2 Adjusted Mean Score of Overall Mathematics Post-test Achievement According To Gender

Dependent Variable: Overall Post-test Achievement

Gender	Mean	Std. Error
Male	59.872 ^a	.936
Female	62.330 ^a	.929

a Covariates appearing in the model are evaluated at the following values: Overall Pretest = 25.91.

Table 2 indicates that the adjusted mean score of the overall Mathematics post-test achievement of the male students is 59.872 (S.D. = .936). The adjusted mean score of the overall Mathematics post-test achievement of the female students is 62.330 (S.D. = .929). There is a difference of 2.458 between the adjusted mean score of the male students and the female students. Table 3 shows the ANCOVA result.

Table 3 ANCOVA Result Showing The Effects of Instructions On Overall Mathematics Achievement

Dependent Variable: Overall Post-Test Achievement

Source	Type III Sum of Squares	df	Mean square	F	Sig.
Corrected Model	28808.893 ^b	2	14404.447	271.233	.000
Intercept	53384.914	1	53384.914	1005.229	.000
Overall Pre-test	27736.218	1	27736.218	522.268	.000
Gender	183.303	1	103.303	3.452	.066
Error	6372.866	120	53.107		
Total	494533.611	123			
Corrected Total	35181.759	122			

a Computed using alpha = .05

b R Squared = .819 (Adjusted R Squared = .816)

Table 3 shows that there was no significant difference at the level $p < .05$ between the overall Mathematics achievement mean score of the male students and the overall Mathematics achievement mean score of the female students ($F_{(1,250)} = 3.452, p = .066$). Thus, Ho1 failed to be rejected.

Ho2 : There is no significant difference in the adjusted mean score of Mathematics Achievement Test Multiple Choice Item (MATMI) between the group of female students and the group of male students who received classroom instruction which integrates emotional intelligence.

Ho3 : There is no significant difference in the adjusted mean score of Mathematics Achievement Test Subjective Item (MATSI) between the group of female students and the group of male students who received received classroom instruction which integrates emotional intelligence.

Box'M test result is shown in Table 4.

Table 4 Box's Test of Equality of Covariance Matrices^a

Box's M	6.495
F	2.126
df1	3
df2	2658137.404
Sig.	.095

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a Design: Intercept+pre1+pre2+gender

The result of Box's M test is not significant showing that there is equality in the covariance matrices. The Levene's test result is as shown in Table 5.

Table 5 Levene's Test of Equality of Error Variances^a

	F	df1	df2	Sig.
MATMI Post-test	2.810	1	121	.096
MATSI Post-test	2.097	1	121	.150

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a Design: Intercept+pre1+pre2+gender

Table 5 shows that the Levene's test result is not significant indicating that the variances of both groups in MATMI and MATSI are equal.

Table 6 presents the adjusted mean scores of MATMI and MATSI for both genders.

Table 6 Adjusted Mean Score of Achievement in MATMI and MATSI According to Gender

Dependent Variable	Gender	Mean Score	Standard Error
MATMI Post-test	Male	19.519 ^a	.331
	Female	20.408 ^a	.328
MATSI Post-test	Male	22.535 ^a	.459
	Female	23.441 ^a	.455

a Covariates appearing in the model are evaluated at the following values: Pretest MATMI = 10.10, Pre test MATSI = 8.30.

Table 6 shows that the adjusted mean score of MATMI post-test among male samples is 19.519 (S.D. = .331) whereas the adjusted mean score of MATMI post-test among female samples is 20.408 (S.D. = .328). There is a difference of 0.889 in the adjusted mean score of achievement in MATMI post-test between male and female samples.

Similarly, the adjusted mean score of MATSI post-test among male samples is 22.535 (S.D. = .459) while the adjusted mean score of MATSI post-test among female samples is 23.441 (S.D. = .455). There is a difference of 0.906 in the adjusted mean score of achievement in MATSI post-test between male and female samples.

MANCOVA result is shown in Table 7.

Table 7 MANCOVA Result Showing the Effect of Instruction on Students' Achievement in MATMI and MATSI

	Value	F	Hypothesis df	Error df	Sig.
Pillai's trace	.034	2.096 ^b	2.000	118.000	.127
Wilks' lambda	.966	2.096 ^b	2.000	118.000	.127
Hotelling's trace	.036	2.096 ^b	2.000	118.000	.127
Roy's largest root	.036	2.096 ^b	2.000	118.000	.127

Each F tests the multivariate effect of Gender. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

a Computed using alpha = .05

b Exact statistic

Table 7 shows that there was no significant difference at the level of $p < .05$ for dependent variables between the group of male students and the group of female students. (Wilks' lambda = .966, $p = .127$). Thus, Ho2 and Ho3 failed to be rejected.

DISCUSSION

In this study, samples had received classroom instruction which integrates emotional intelligence. The result failed to prove that there was significant difference in male and female students' achievement in Mathematics. In other words the study did not prove that by integrating emotional intelligence in teaching and learning process will give better impact to certain gender compared to the other. This result is vice versa to those previously found by Alkhateeb (2001); Bessoondyal (2005); Dmitrieva et al.; (2003); and Tella (2007). Thus, the study did not prove any gender bias as an effect of integrating emotional intelligence in classroom instruction.

It is important to be conscious of that impact of our negative emotion has on other people as well. Emotionally intelligent person knows how to manage negative emotions effectively by eradicating these negative influences efficiently. For example, they are capable to turn the negative situation around and view the situation from the positive view. Thus, in order to help students develop and increase the stage of their emotional intelligence teachers may integrate emotional intelligence while delivering the curriculum.

This study had embarked in lower secondary Mathematics in Malaysian schools. Further studies could be done to involve other subjects offered either in primary or secondary school levels.

CONCLUSION

Although there are a number of differences among males and females, it is not a barrier to implement any innovations that involve both genders. As teachers it is important to be aware with the differences to better understand the students, either male or female, and ensure they are capable to reach their full potential in any program or innovation introduced.

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