GENDER AND ACHIEVEMENT EMOTIONS OF FRESHMEN EDUCATION STUDENTS IN MATH 102 (FUNDAMENTAL OF MATHEMATICS)

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ABSTRACT

Penelitian ini bertujuan untuk melihat apakah ada hubungan antara gender dengan emosi mahasiswa pada saat belajar mata kuliah matematika dasar. Selain itu, penelitian ini juga mencari apakah ada perbedaan yang signifikan antara emosi laki-laki dan perempuan dalam belajar mata kuliah matematika dasar. Studi ini dilakukan pada semester ganjil tahun akademik 2010-2011 di Fakultas Ilmu Pendidikan (College of Education) di Central Luzon State University, Philippine. Adapun responden dari penelitian ini adalah mahasiswa semester satu dengan jumlah 211 siswa (47 laki-laki, 164 perempuan) dengan mengunakan random sampling technique. Adapun instrumen yang digunakan adalah Achievement Emotions Questionnaire – Mathematics (AEQ-M) yang di kembangkan oleh Pekrun (2005). Hasil yang ditemukan dari penelitian ini adalah, dari ketujuh emosi yang dikaji - senang, bangga, marah, cemas, malu, putus asa, dan bosan – ditemukan bahwa rasa tegang dan malu itu sangat berkaitan dengan gender. Selain itu, selama belajar matematika, perempuan dinyatakan lebih merasa cemas dan malu dibandingkan dengan laki-laki.

Kata Kunci: *Gender, Achievement Emotions Of Freshmen*

A. INTRODUCTION

Among the different constructs directly associated to learning, the area of achievement emotions is one of those which have not been given much attention in the field of educational psychology as a discipline. However, it does not mean that these are insignificant for they play an indispensable role which undebatably affects the learning of the students. As cited by Pekrun, Maier, and Elliot (2006), Lewis and Haviland-Jones (2000) posited that results of psychological and neuroscientific researches have proven the fundamental importance of emotions to learning and memory, motivation, development, psychological health, and neuroimmunological functioning. Emotions could also impact on learners' academic performance by altering the dopamine level in the brain which causes long-term memory (Ashby, Isen, and Turken, 1999 as cited by Pekrun, et al, 2006). Emotions could also direct attentional processes and the use of cognitive resources (Meinhardt and Pekrun, 2003). Ainley, Corrigan, and Richardson (2005) claimed that emotions also induce and sustain student interest in learning materials. Emotions also trigger different modes of information processing and problem solving (Isen, 1999) and facilitate or impede students' self-regulation of learning and performance (Pekrun, Goetz, Titz, and Perry, 2002) .

Of the many courses taken by students in the tertiary level, it is interesting to note that Mathematics is one of the subjects which could really elicit different emotions from different types of learners. Since it is generally accepted that emotions could really affect learning, identifying the emotions of students in Mathematics could help teachers to better understand their learners and make adjustments to their instruction.

Moreover, it is also worthy to look into the possible factors which could be linked to different types of achievement emotions.

Statement of the Problem

We cannot negate the fact about the interplay of emotions and achievement or performance. Therefore, identifying the emotions of students towards a course could somehow shed light to better understand their performance. Furthermore, identifying the constructs which could be attributed to a certain type of emotion could also be beneficial in making the necessary adjustments in instruction to ascertain that every learner will benefit from the instruction delivered by the teacher. To these needs this study was anchored.

Objectives of the Study

Generally, this study aimed to identify the achievement emotions of Math 102 (Fundamentals of Mathematics) students. Specifically, it aimed to:

1. determine if there is a significant relationship between gender and achievement emotions in Mathematics, and
2. find out if there is a significant difference between males and females in terms of their achievement emotions in Mathematics.

Hypothesis of the Study

The null hypotheses tested in this study could be stated as follows:

1. there is no significant relationship between gender and achievement emotions in Mathematics, and
2. there is no significant difference between males and females in terms of their achievement emotions in Mathematics.

Significance of the Study

The significant effects of achievement emotions to academic performance have been established by various researches. This study may provide information which would be beneficial to each of the following:

For Students

Knowing their own achievement emotion may aid the students to better understand themselves and monitor their own learning. They would be able to make necessary adjustments to boost their performance in Mathematics through knowing their emotions and its effects to their Mathematics achievement.

For Teachers

Results of this study will guide the teachers to gain insights relative to the relationship of gender to achievement emotions of their students in Mathematics. Through this, they will be aware of what is going on with their male and female learners before, during, and after Mathematics classes. They will also realize that male and female learners have different feelings towards Mathematics subjects, thereby giving

them a clear signal to design instruction in such a manner that every single student will benefit regardless of his/her gender.

Scope and Limitation of the Study

This study was focused chiefly on the achievement emotions of Math 102 (Fundamental of Mathematics) Subject students and the probable correlation of gender to these.

The data were limited to the responses of the student respondents on the Achievement Emotions Questionnaire – Mathematics (AEQ-M).

B. METHOD OF RESEARCH

This chapter presents the conceptual framework of the study, operational definitions of terms, sampling procedure, research design, time and locale of the study, population and respondents of the study, instrumentation, data gathering procedure and statistical methods.

Conceptual Framework

The conceptual basis of this study was anchored on the achievement emotions of the students.

The learners are the main focus of the teachers. In an ideal perspective, teachers are not teaching if the learners are not learning. There are times, however, that the performance of the students is determined by the constitutional factors that they have --- one of which is emotions.

Emotions are important across age groups, genders and cultures (Shweder and Haidt, 2004), and the impact of emotions in educational contexts is pervasive.

According to Pekrun (2000), achievement emotions are defined as emotions that are already linked to achievement activities or achievement outcomes. There are some studies focused on the emotions which relate those emotions to the achievement outcomes of the learners. Emotions (enjoyment, pride, hope, boredom, anger, shame, anxiety, helplessness) are linked to either success or failure of the learners.

Conceptual Paradigm

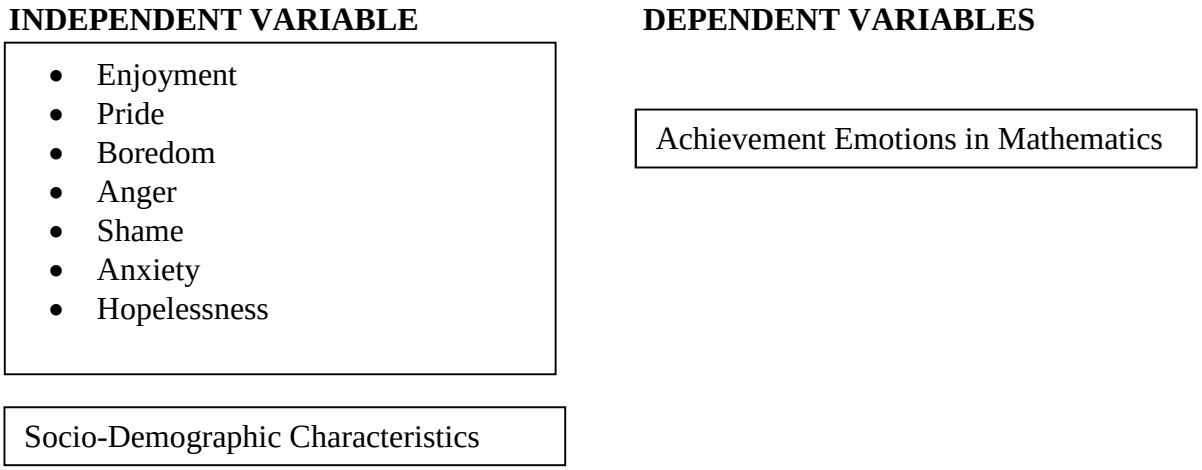

Figure 1. Research paradigm showing the hypothesized relationship between the independent and the dependent variables.

Operational Definition of Terms

For clarity and better understanding of the research concepts and findings, the terms used in this study were operationally defined.

Students' socio-demographic characteristic refers to the personal data about the student-respondents. Under this big umbrella is the respondents' gender.

Gender refers to whether the student – respondent is a male or a female.

Achievement emotions in Mathematics refer to sets of interrelated psychological processes including affective, cognitive, physiological, and motivational components. These include such emotions as enjoyment, pride, hope, boredom, anger, shame, anxiety, and helplessness.

Research Design

The study employed correlation research design as it explained the relationship of gender to the achievement emotions of the respondents.

Time and Locale of the Study

This study was conducted during the First Semester of Academic Year 2010-2011 at the College of Education, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippine.

Population and Respondents of the Study

The respondents of the study were 211 students (male – 47; female – 164) enrolled in Math 102 (Fundamentals of Mathematics) after they have taken their preliminary examination in the said course. The respondents are first year students of the College of Education, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippine.

Sampling Procedure

The 211 respondents were randomly selected from among the fourteen sections of freshmen Education students enrolled in Math 102 (Fundamentals of Mathematics).

Instrumentation

To profile the achievement emotions of the respondents, the Achievement Emotions Questionnaire – Mathematics (AEQ-M) developed by Pekrun, Goetz, and Frenzel from the Department of Psychology, University of Munich, Germany in 2005 was administered. This instrument is composed of 60 items which are classified according to the discrete emotions relating to Mathematics that they measure, to wit: enjoyment, pride, anger, anxiety, shame, hopelessness, and boredom. As per the manual in administration of the test, 15 minutes were allotted for the respondents to answer the scale.

Data Gathering Procedure

Before the data have been gathered, the researchers sought the permission of the teachers handling Math 102 classes. Actual data collection was done immediately after the students have finished answering their First Term Examination. The questionnaires were answered by the respondents in one sitting, approximately 10 to 15 minutes administration time as specified in the User's Manual (2007 version).

Statistical Methods

This study made use of descriptive statistics such as mean, standard deviation, Cronbach's alpha to ascertain the reliability of the respondents' answers, and ANOVA (analysis of variance) to identify the difference among the achievement emotions of male and female respondents.

C. RESULTS AND DISCUSSION

Table 1 shows the values of the Cronbach's alphas which attest to the reliability of the answers given by the respondents since they have passed the 0.70 critical value.

Table 1. Cronbach's Alphas

Achievement Emotions	Cronbach's Alphas
Enjoyment	0.79
Pride	0.82
Anger	0.83
Anxiety	0.83
Shame	0.72
Hopelessness	0.76
Boredom	0.80

In Table 2, result shows that gender has a significant relationship to two achievement emotions, to wit: anxiety and shame.

Similarly, Frenzel (2006) found out that the emotions and beliefs of 1,036 male and 1,017 female 5th grade students were assessed by self-report measures, and their prior mathematics achievement was assessed by academic grades. Even though girls and boys had received similar grades in mathematics, girls reported significantly less enjoyment and pride than boys, but more anxiety, hopelessness and shame. Findings suggested that the female emotional pattern was due to the girls' low competence beliefs and domain value of mathematics, combined with their high subjective values of achievement in mathematics. Multiple-group comparisons confirmed that the structural relationships between variables were largely invariant across the genders.

Table 2. Relationship of Gender to Achievement Emotions

	Means	Std.Dev.	Gender	Enjoy ment	Pride	Anger	Anxiety	Shame	Hope-lessnes	Bore-dom
Gender	1.777	0.417	1.000							
Enjoyment	3.600	0.486	-0.093	1.000						
Pride	3.675	0.661	-0.024	0.742	1.000					
Anger	2.188	0.597	0.022	-0.496	-0.357	1.000				
Anxiety	2.921	0.555	**0.169***	-0.339	-0.240	0.560	1.000			
Shame	2.693	0.606	**0.161***	-0.200	-0.179	0.498	0.696	1.000		
Hopelessness	2.639	0.721	0.129	-0.436	-0.429	0.540	0.744	0.686	1.000	
Boredom	1.866	0.624	-0.105	-0.472	-0.328	0.737	0.561	0.408	0.440	1.000

Legend: * Significant (P .05)

Table 3 shows that between male and female students, female showed significant level of anxiety and shame towards the subject Mathematics. This was also observed by Onwuegbuzie (1995) that high-anxious female students underperform in time-limited examinations compared to their low-anxious counterparts. Moreover, he discussed that interaction was found between test anxiety and examination condition, with high anxiety tending to be associated more strongly with underachievement in the time-limited than the time-unlimited condition.

Table 3. Differences in Anxiety and Shame between Males and Females

	Mean - 1	Mean - 2	t-value	df	P	Valid N - 1	Valid N - 2	Std.Dev. - 1	Std.Dev. - 2
Anxiety	2.746099	2.971480	-2.48025	209	0.013919	47	164	0.521543	0.556789
Shame	2.510638	2.745427	-2.36560	209	0.018916	47	164	0.590821	0.602412

D. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study was conducted to profile the achievement emotions of Math 102 students and to validate the probable correlation of gender to these emotions. The respondents for this study were 211 Math 102 students during the First Semester, School Year 2010-2011.

The study revealed that among the seven achievement emotions, anxiety and shame were found to be correlated with gender.

Also, females are more prone to feel anxiety and shame towards their Math classes.

Conclusions

Based on the findings of the study, the following conclusions were drawn:

1. Anxiety and shame are correlated with gender.
2. Between the two genders, females are more likely to experience anxiety and shame in their Math classes.

Recommendations

Based on the results and conclusion of this study, the following recommendations were made:

1. Since achievement emotions were proven to be affecting student performance in mathematics, extra effort should be devoted by the teacher to the monitoring of the emotions of the students. Although most of the emotions are discreet, teachers should be continuously on the look out for behavioral manifestations of these emotions.
2. Mathematics teacher should be sensitive to the emotions of the students towards their class. Since females are more prone to feeling anxiety and shame, the teacher should give them particularly attention without neglecting the students belonging to the other gender.

LITERATURE CITED

Ainley, M**., Corrigan**, M., and RICHARDSON, N. (2005). Students, tasks and emotions: Identifying the contribution of emotions to students' reading of popular culture and popular science texts. Learning and Instruction, 15(5), 433-447.

Ashby, F. G., ISen, A. M., and Turken, A. U. (1999). A neuropsychological theory of affect and its influence on cognition. Psychological Review, 106, 529-550.

Frenzel, A.C., Goetz, T., and Pekrun, R. (2006). The Domain Specify of Academic Emotional Experiences. The Journal of Experimental Education. Heldref Publication

Lewis, M., and Haviland-Jones, J.M. (2000). Handbook of Emotions. Third Edition (Paperback).

Meinhardt and Pekrun.R., (2003). Emotions in Education. A Volume in the Educational Psychology Series. Academic Press

Onwuegbuzie, A. J. (1995), STATISTICS TEST ANXIETY AND FEMALE STUDENTS. Psychology of Women Quarterly, Vol.19: 413–418.

Pekrun, R., M. A. MAIER and A. J. ELLIOT. (2006). Achievement goals and discreet achievement emotions: A theoretical model and prospective test. Journal of Educational Psychology. 98 (3): 583-597.

Pekrun , R , Goetz, T . , Titz, W . , and Perry, R P . (2002). Academic emotions in students' self-regulated learning and achievement: A program of quantitative and qualitative research. Educational Psychologist, 37, 9 1 - 1 06.

Spielberger,C.D., (1980). Test Anxiety Inventory. Preliminary Professional Manual. Palo Alto, CA: Consulting Psychology Press.