

A Study on Fijian Secondary School Students' Anxiety toward Mathematics and their Academic Achievement

— Considering School Avoidance and Teachers' awareness —

ISHIZAKA Hiroki

Naruto University of Education

Abstract : the purpose of this study is to research and analyze the secondary school students' attitude toward Mathematics and their weak points of mathematical knowledge, in consideration with school avoidance and teachers' level of perceiving the students' issues. In the study, it is confirmed that 1) the class-related anxiety in Mathematics could have a negative correlation with the attendance rate, mutually being liked with the tendency of school avoidance, 2) the anxiety for problem solving, teachers and surrounding people grows as much as the students get promoted and 3) the level of understanding geometry remained very low. It is concluded that the school avoidance should be dealt with not only from the socioeconomic sector, but also from the school and teachers, especially teaching contents and method.

Keywords : Mathematics anxiety, school avoidance, Fiji

1. Research background and purpose as an introduction

The Republic of Fiji is located in the South Pacific Ocean and comprises an archipelago of more than 332 islands. Its population is approximately 849,000, 51% of which is Fijian native and 44% of which is Indian descendant. Thus, the national language consists of English, Fijian and Hindi (Fijian Hindi). Fijian system of school education consists (compulsory schooling) of the 6-year primary education (Classes 1 to 6) and the 6-year secondary education (Form 1 to 6). In actuality, since the previous system of Class 1-8 (primary education) and Forms 3-7 (secondary education) was traditionally accepted by the nation, many schools still follow it. The Net Enrollment Ratio (NER) of the primary education was 97% and that of the secondary education was 84% (MoE, 2011 ; 2012a).

Since in 2009 and 2010 the Fijian Government abolished several external examinations at the primary and secondary levels, the dropout rate has drastically decreased. According to the MoE (2012c), the dropout rate of secondary level shrank from 5.0% (2008) to 0.3% (2010) meanwhile that of primary education changed from 1.3% (2008) to 0.2% (2010). However, 65% of students have passed the Fiji School Leaving Certificate Examination (FSLCE), which is conducted at the end of the Form 6, so that almost 35% of the Form 6 students can't graduate from the secondary school and should repeat the grade, drop out of the school¹ (MoE, 2012a). Among the examined subjects, Mathematics shows the lowest score and passing rate and is defined by the MoE as one of the core issues of quality education.

The purpose of this study is defined by the author as researching and analyzing the secondary school students'

¹ Some of the students who dropped out of school join vocational education offered in certain schools or institutions.

attitude toward Mathematics and their weak points of mathematical knowledge, in consideration with school avoidance² and teachers' level of perceiving the students' issues. This study is expected to offer helpful information to elaborate and implement a better educational policy with respect to the drop-out issues and quality education in Mathematics. The study's detail is described below.

2. Theoretical framework for applying psychometric scaling

The first scholars who mentioned the Mathematics anxiety were said to be Dreger and Aiken (1957). According to them, the Mathematics anxiety is defined as a "syndrome of emotional reaction to Arithmetic and Mathematics". After several researchers developed questionnaires and small rating scales relevant to the Mathematics anxiety, finally Richardson and Suinn (1972) elaborated a commonly used scale, so-called "Mathematics Anxiety Rating Scale (MARS)". Firstly, this scale is developed with 98 question items to estimate the Mathematics anxiety in daily life and studying scene. 40 items were selected by Brush (1976) due to a validity analysis and nowadays commonly used in the psychological study. Cronbach's α^3 of the MARS is 0.93, which value is quite high.

In Japan, Fujii (1994) firstly employed the MARS and adjusted it to the country's context, since there was no psychometric scale to evaluate the Mathematics anxiety in the country. As a result of applying the translated and culture-fitted MARS (the principal component analysis & varimax rotation), Fujii (1994) concluded that the MARS is sufficiently reliable (Spearman-Brown's reliability coefficient of the split-half method was 0.89) and defined two factors: "Mathematics Learning Anxiety Factor" and "Mathematics Assessment Anxiety Factor". According to Fujii (1994)'s regression analysis using the MARS's scores (N=146), it was inferred that, as much as the students perceived the difficulty of Mathematics and disliked Mathematics, the Mathematics anxiety heightened.

On the other hands, Watabe and Sakuma (1998), recognizing the effectiveness of Fujii (1994)'s MARS and the importance of alleviation of Mathematics anxiety to improve students' academic achievement, developed an original Mathematics anxiety scale (the author of this study

calls it "Mathematics Anxiety Scale (MAS)") for detecting methods of teachers' support. According to Watabe and Sakuma (1998), many scholars affirm that the teachers' support to the students can generate positive repercussions over the students' emotion and even academic achievement (Fujii, 1994; Reed, 1961; Kawano, 1988). Based on this understanding, Watabe and Sakuma prepared 18 scale items and conducted a factor analysis (the principal component analysis & varimax rotation), applying them to primary schools' students (N=312).

As a result, 4 factors, which showed more than 1 as an eigenvalue were extracted (as the whole scale: $\alpha=0.80$). Namely, they were the "Class Related Anxiety Factor (CRAF) ($\alpha=0.81$)", "Problem Solving Failure Anxiety Factor (PSFAF) ($\alpha=0.67$)", the "Concern-for-Teacher Anxiety Factor (CTAF) ($\alpha=0.43$)" and the "Concern-for-Surroundings Anxiety Factor (CSAF) ($\alpha=0.34$)". The CRAF means the anxiety the students feel when they are learning in a lesson or certain situation relevant to the lesson. The PSFAF explains the preoccupation they feel when solving a problem in a test, homework or lesson. The CTAF and CSAF are what they worry when teachers and friends look at their learning or solving a problem.

According to Yoshida and Yamashita (1987), there is a perception gap on learning motivation between students and teachers, and if it is the case, the teachers may misunderstand that certain stimulant pedagogical actions doesn't influence the students' learning motivation, or vice versa, disturbing factors doesn't affect it. Therefore, it is also indispensable to understand the teachers' perception on the students' learning motivation, including its positive and negative factors such as support and disturbance (anxiety) toward learning.

With respect to the school avoidance, many scholars developed their own psychometric scale to estimate it. Particularly in the Japanese society of the educational psychology, this issue, along with serious phenomena such as mental illness, extreme reclusiveness (the so-called "Hikikomori" in Japanese) and cruel violence, has been dealt with as one of the most crucial controversies in the education sector. At first time, the term "School Avoidance Feeling" emerged when Morita (1991) published his study

² School avoidance means the fact that the students fail to go to school, as well as absenteeism and truancy.

³ It is a coefficient of internal consistency used as an estimate of the reliability of a psychometric test for a sample of examinees.

on students who used to truant or are in a similar situation. Morita (1991) defined that the "School Avoidance Feeling" was the students' sentiment of feeling like not going to school, regardless of how many days a student actually fails to go to school.

The "School Avoidance Feeling Scale (SAFS)" has been developing in Japan in an original way that the poverty is not necessarily considered as the core cause of the school avoidance. Rather, 1) the students' mental condition such as self-esteem, self-disgust and depression, 2) the relationship (social support) between the students and stakeholders such as friends, teachers, family and community and 3) the impression or thought about school and lesson have been taken into account as main objects of study (Watanabe and Koishi, 2000 ; Satoh and Saito, 2001 ; Tomishige and Ogura, 2001 ; Kaneko et al., 2003 ; Nakashima and Hara, 2009 ; Suzuki et al., 2011). Apart from the discussion on the validity of this rationale, at least, it is assumed that the "School Avoidance Feeling Scale" in Japan could enrich its variety for searching the students' mental condition, human relationships and school and lesson matters.

One of the most frequently used SAFS among psychologists in Japan is the model of Watanabe and Koishi (2000). Firstly, they elaborated the SAFS, citing and modifying 34 scale items which estimate the perception toward school life (Kuze et al., 1985) and truant tendency (Haraoka, 1972). Using the 34 scale items, a factor analysis was conducted (N=354, the principal factor analysis & varimax rotation). Ultimately, 28 items remained after removing items, whose factor loading was 0.40 or less than 0.40 for 1 factor, or, was more than 0.40 for more than 1 factor. Out of these 28 items, 26 items (as the whole scale:

$\alpha=0.89$) were categorized into three factors: the "School Rebellion Tendency Factor (SRTF) ($\alpha=0.87$)", "Friendship Isolation Tendency Factor (FITF) ($\alpha=0.84$)", "Attendance Disgust Tendency Factor (ADTF) ($\alpha=0.81$)".

3. Research methods and objects

Basically, quantitative methods are applied in this study in order to research whether there is any relationship and tendency among the Mathematics anxiety, the school avoidance, the mathematical knowledge and teachers' perception on the students' issues. Questionnaire survey based on the Likert scale (five ordered response levels in this study) and a small Mathematics test were conducted in a secondary school, a girls college (the students' N=331, the teachers' N=23), in the capital city of Fiji, Suva, between July 23rd and 27th, 2012. As well as this research, the attendance record (the first term of 2012) of the corresponding students was collected. This college started as a secondary school for Indian girls, but today, around 70% of students are Fijian and the rest are Indian. The average academic achievement of the school is categorized as one of the lowest in the country.

For the questionnaire, the "Mathematics Anxiety Scale (MAS)" (Watabe and Sakuma, 1998) and the "School Avoidance Feeling Scale (SAFS)" (Watanabe and Koishi, 2000) were employed, translating all the scale items from Japanese to English, consulting with 3 Fijian teachers of the girls college and modifying them to contextualize the questionnaire and ensure these scale's structural validity. In contextualizing the questionnaire, it was concluded that the same number and basic contents of the scale items were going to be utilized for the research (refer to the Table 1 and Table 2)

Table 1 : The Question Items for the "Mathematics Anxiety Scale (MAS)"

<p><Class Related Anxiety Factor (CRAF)></p> <ol style="list-style-type: none"> (1) When you have to start studying a new unit (topic) (2) When you are asked to do homework (3) Suddenly you are asked to take a test (4) When you have to solve a story problem during the lesson (5) When the duration of the test is defined (6) When there are too many calculation questions (7) When you are told by the teacher to review the mathematics lesson (8) When you are told by the teacher to write an answer on the blackboard in front of your friends (9) When you couldn't understand the question the teacher raised and the teacher came to check your answer

<Problem Solving Failure Anxiety Factor (PSFAF)>

- (10) When you don't understand the second half of a question even though you understand its first half.
- (11) When you can't fill up the whole blanks of the test
- (12) When you noticed your errors after submitting the test
- (13) When the test asks you to solve a question that you couldn't have solved before
- (14) When you don't understand the homework's questions

<Concern-for-Teacher Anxiety Factor (CTAF)>

- (15) When you didn't do homework
- (16) When your friend said to you "you couldn't solve it?" after you couldn't solve the question

<Concern-for-Surroundings Anxiety Factor (CSAF)>

- (17) When you are likely to have bad marks on the test when it is returned to you
- (18) When your teachers teach or talk more quickly according to their convenience

Table 2 : The Question Items for the "School Avoidance Feeling Scale (SAFS)"

<School Rebellion Tendency Factor (SRTF)>

- (1) I have friendly feelings toward my teachers.
- (2) I have friendly feelings toward my school.
- (3) I feel free to consult with my teachers.
- (4) I'm proud of being a student of the school.
- (5) I dislike my school.
- (6) I sometimes feel lessons are a waste of time.
- (7) I feel uncomfortable when taking a lesson.
- (8) I think studying in school is useful for future life and job.
- (9) I think that every day would be delightful if I didn't need to take a lesson.
- (10) I think I can do something else when the lesson seems boring.
- (11) I'm used to following the school's rule.

<Friendship Isolation Tendency Factor (FITF)>

- (12) I have close friends.
- (13) I don't belong to any friend group.
- (14) I'm happy to be with my friends.
- (15) I usually talk to my friends about things other than the study.
- (16) I don't like to belong to a friend group for studying or playing.
- (17) I sometimes feel depressed to have a friendship.
- (18) I'm comfortable to be alone rather than being together with my friends.
- (19) I'm trying to get along with my friends.
- (20) I don't care if my friends don't deal with me.

<Attendance Disgust Tendency Factor (ADTF)>

- (21) I sometimes want to be absent from the school.
- (22) I sometimes don't want to go to the school.
- (23) There is always something unpleasant in the school.
- (24) I want to go home as soon as the lesson is over.
- (25) I sometimes feel lonely being in the school.
- (26) I'm uncomfortable to be in the school.

The test questions (refer to the Annex 1) were comprised of 1) decimals and fraction (9 questions), 2) angle (3 questions), 3) surface area (1 question) and 4) story problem (3 questions). The test's contents were programed to be what all the sample students should have learned, therefore, what was based on the Fijian curriculum and textbooks of the Form 3. The scoring system is that 1 correct answer was counted as 1, so that the total score was 16. Based on the total score and students' earned score, the

accuracy rate was calculated for the whole test and each mathematical field. The test duration to answer all questions was 1 hour.

4. Findings and analysis

1) The "Mathematics Anxiety Scale (MAS)"

As the whole scale, Cronbach's α of the MAS applied in this study was 0.82, meanwhile that of the "Class

Related Anxiety Factor (CRAF)", the "Problem Solving Failure Anxiety Factor (PSFAF)", the "Concern-for-Teacher Anxiety Factor (CTAF)" and the "Concern-for-Surroundings Anxiety Factor (CSAF)" were 0.72, 0.75, 0.55 and 0.65 respectively.

The Kruskal-Wallis Test, which is one of the nonparametric statistical method, was adopted in this study to figure out whether there is any difference of the MAS

factors' total score among the students of the Form 3, 4, 5 and 6. The hypothesis analysis showed a significant difference among the forms in the PSFAF, CTAF and CSAF (refer to the Table 3). According to the results of multiple comparison, it is confirmed that the average total score of PSFAF, CTAF and CSAF tends to increase gradually from the Form 3 to 6. It can be inferred that as far as the students get promoted and grow, they feel more shame if they fail or their teacher or friends see their failure or weak points.

Table 3 : MAS Results Comparison among Forms (3-6)

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Class Related Anxiety is the same across categories of Form.	Independent-Samples Kruskal-Wallis Test	.254	Retain the null hypothesis.
2	The distribution of Problem Solving Failure Anxiety is the same across categories of Form.	Independent-Samples Kruskal-Wallis Test	.005	Reject the null hypothesis.
3	The distribution of Concern-for-Teachers Anxiety is the same across categories of Form.	Independent-Samples Kruskal-Wallis Test	.013	Reject the null hypothesis.
4	The distribution of Concern-for-Surroundings Anxiety is the same across categories of Form.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

2) The "School Avoidance Feeling Scale (SAFS)"

As the whole scale, the α of the SAFS applied in this study was 0.74, meanwhile that of the "School Rebellion

Tendency Factor (SRTF)", the "Friendship Isolation Tendency Factor (FITF)" and the "Attendance Disgust Tendency Factor (ADTF)" were 0.64, 0.44 and 0.70 respectively.

Table 4 : SAFS Results Comparison among Forms (3-6)

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of School Rebellion Tendency is the same across categories of Form.	Independent-Samples Kruskal-Wallis Test	.003	Reject the null hypothesis.
2	The distribution of Friendship Isolation Tendency is the same across categories of Form.	Independent-Samples Kruskal-Wallis Test	.079	Retain the null hypothesis.
3	The distribution of Attendance Disgust Tendency toward schooling is the same across categories of Form.	Independent-Samples Kruskal-Wallis Test	.260	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

As well as the MAS case, the Kruskal-Wallis Test showed a significant difference among the forms, but only in the SRTF (refer to the Table 4). According to the results of multiple comparison, it is also confirmed that the average total score of the SRTF rose gradually from the Form 3 to 6. It is considered that as far as the students grow adolescent, they feel more uncomfortable if they think of their school or teacher.

3) Combination of the two scale's findings

The results of the Pearson's Correlation Analysis on the MAS and SAFS factors as follows (refer to the Table 5) :

- a) Mutually, the PSFAF, CSAF and CTAF were strongly correlated.
- b) A correlation was confirmed between the CRAF, and, the PSFAF, CTAF and SRTF respectively.
- c) The CRAF was moderately correlated with the CSAF and ADTF.
- d) The SRTF was correlated with the ADTF and moderately correlated with the FITF.

With respect to the SAFS, the results of the independent samples t-test for equality of the average scores showed that the difference of the ADTF mean score

was statistically significant between a student group of less than 85% (A) as an attendance rate⁴ and another group of 85% or more than 85% (B). It is understandable that

among the three factors of the SAFS, the ADF is the most relevant to the attendance rate (refer to the Table 6).

Table 5 : Summary of Correlation among the MAS & SAFS Factors

	Type of correlation	Class Related Axiety	Problem Solving Failure Anxiety	Concern-for-Teachers Anxiety	Concern-for-Surroundings Anxiety	School Rebellion Tendency	Friendship Isolation Tendency	Attendance Disgust Tendency
Class Related Axiety	Pearson Correlation	1						
Problem Solving Failure Anxiety	Pearson Correlation	.388**	1					
Concern-for-Teachers Anxiety	Pearson Correlation	.322**	.700**	1				
Concern-for-Surroundings Anxiety	Pearson Correlation	.245**	.625**	.694**	1			
School Rebellion Tendency	Pearson Correlation	.333**	0.059	0.018	-0.071	1		
Friendship Isolation Tendency	Pearson Correlation	.157*	-0.029	-0.1	0.036	.272**	1	
Attendance Disgust Tendency	Pearson Correlation	.230**	0.075	-0.004	-0.016	.464**	.195*	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Regarding the results and analysis in the previous sessions, a simplified path diagram was made by the author (refer to the Diagram 1). According to the diagram, the CRAF seems to have a principal role to connect between the MAS factors and the SAFS factors, since the CRAF is correlated not only with the other MAS factors, but also

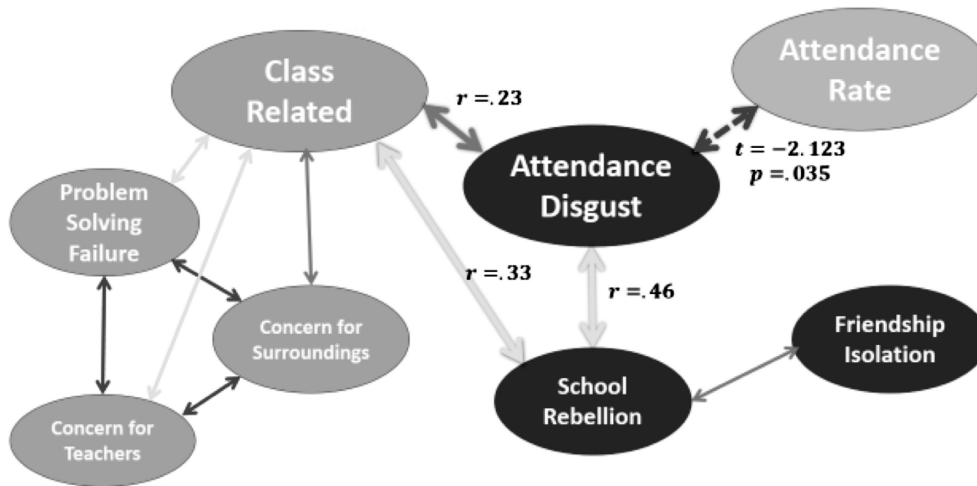
with the two SAFS factors, that is to say, the ADF and SRTF. On the other hands, the ADF seems to play a liaison role, in the diagram, between the MAS, in particular, the CRAF and the attendance rate, and the SRTF helps the ADF connecting between the CRAF and ADF.

Table 6 : Comparison between 2 Groups of the Attendance Rate (A < 85% =< B)

School Avoidance Feeling Scale	Independent Samples t-test for Equality of Means			
	t	df	Sig. (2-tailed)	Mean Difference
School Rebellion Tendency	-0.727	173	.468	-0.768
Friendship Isolation Tendency	1.591	191	.113	1.246
Attendance Disgust Tendency	-2.123	201	.035	-1.587

⁴ The attendance rate was calculated by the school, based on the total schooling days and actual attendance days in a past term.

Diagram 1 : Simple Path Diagram (relationship among two scales and attendance rate)



4) Comparison between the data of students and that of teachers

As well as the students' data analysis, the teachers' one was also calculated and analyzed. As the Table 7 shows, a significant difference between the students and teachers was corroborated in the CRAF and PSFAF of the

MAS, and the FITF and ADTF of the SAFS. The difference verified in the CRAF, PSFAF and SAFS was negative (t-value), which means the teachers' concern over the students was higher than the students' actual anxiety. Only in the case of the FITF, the teachers' concern appeared much lower than the students' anxiety.

Table 7 : Comparison of the MAS & SAFS Results between the Students and Teachers

	Independent Samples t-test for Equality of Means			
	t	df	Sig. (2-tailed)	Mean Difference
Class Related Anxiety	-3.245	223	.001	-5.372
Problem Solving Failure Anxiety	-2.877	242	.004	-3.208
Concern-for-Teachers Anxiety	-1.917	248	.056	-1.123
Concern-for-Surroundings Anxiety	-1.796	238	.074	-1.043
School Rebellion Tendency	-1.412	192	.160	-2.229
Friendship Isolation Tendency	3.672	211	.000	4.368
Attendance Disgust Tendency	-2.348	223	.020	-2.677

5) The mathematics test

The test results indicated in general that the level of understanding the Form 3 contents was very low (the accuracy rate was 42.7%). Regarding its mathematical field, each field's accuracy rate were the "Decimals and fraction" 0.47, "Angle" 0.30, "Surface area" 0.10 and "Story problem" 0.53, respectively (refer to the Graph 2).

As the Table 8 shows, the difference of the test mean scores among the forms was statistically significant in the fields "Decimals and fraction" and "Story problem". However, the difference was not verified in the "Angle" and "Surface area". From the results mentioned above, it is derived that there confirmed no advance of learning from the lower grade to the higher grade in the geometry, even though an improvement seemed to exist in the algebra and problem solving skill (refer to the Table 8).

Graph 2 : The Mathematics Test Results by Question Type (form 3-6, N=252)

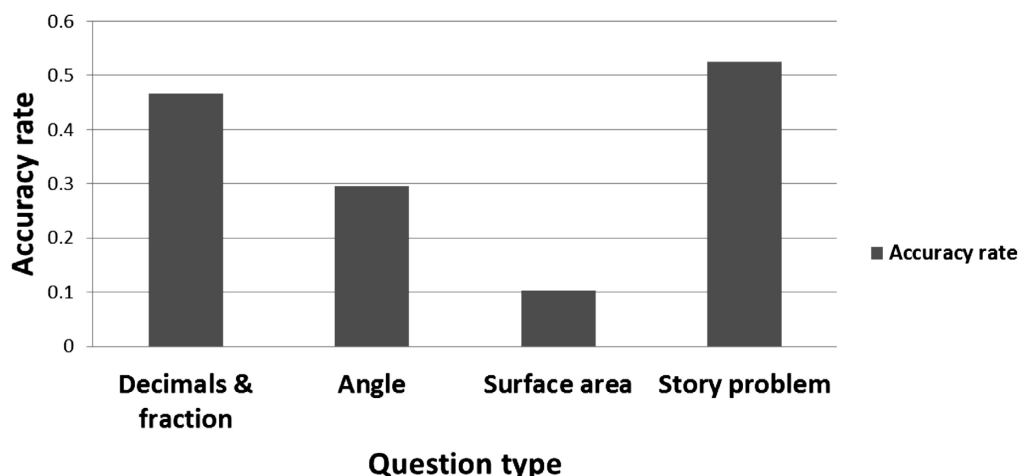


Table 8 : The Mathematics Test Results Comparison among Forms (3-6)

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Decimals and Fraction is the same across categories of Form.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
2	The distribution of Angle is the same across categories of Form.	Independent-Samples Kruskal-Wallis Test	.296	Retain the null hypothesis.
3	The distribution of Surface Area is the same across categories of Form.	Independent-Samples Kruskal-Wallis Test	.124	Retain the null hypothesis.
4	The distribution of Story Problem is the same across categories of Form.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

5. Significance of the study and general conclusions

According to the study results, with respect to the Mathematics Anxiety Scale (MAS), above all, the “Problem Solving Failure Anxiety Factor (PSFAF)”, the “Concern-for-Teacher Anxiety Factor (CTAF)” and the “Concern-for-Surroundings Anxiety Factor (CSAF)” should be coped with at the early level of the school education (including the primary education), since these factors affect the feeling toward Mathematics much larger in the higher grade than in the lower one. Besides, the “Class Related Anxiety Factor (CRAF)” should be much considered at the whole secondary school level, especially, how to teach Mathematics and support the students in lesson is a key issue.

Since the CRAF connects between the MAS factors and the School Avoidance Feeling Scale (SAFS) factors, which could be linked with the school attendance, the improvement on the CRAF, in certain manners, indirectly

might be positively correlated with the attendance⁵. The attendance (absenteeism) issue should be dealt with not only from the socioeconomic sector, but also from the school and teachers, especially teaching contents and method. On the other hands, the “School Rebellion Tendency Factor (SRTF)” of the SAFS also should be taken care of at the early level of the school education (including the primary education). This is because, according to the research results, as far as the students grew adolescent, they could feel more uncomfortable about their school or teacher.

Although in general the teacher’s concerns for the students’ Mathematics anxiety and school avoidance is higher than those of the students, only the FITF showed the opposite results. Thus, the teachers need to consciously take care of the students’ relationship inside and outside of school. Needless to say, the governmental authority should take it into account in supporting the schools.

⁵ Definitely it cannot be denied that the attendance (absenteeism) affects the MAS factors. What was verified in the study was a mutual influential relationship, which was indirect, between them. Both of them as a whole should be considered in the school education.

The analysis of test scores shows that the geometry was at the most critical level and, worse than that, there seemed to be no improvement of geometry's score during the corresponding 4 years of the secondary level. With respect to the story problem, in fact, there is not an ideal improvement among the forms, since most of the students could solve only the first question, which is a simplest question related to the other 2 higher-order-thinking questions. Therefore, it is still necessary to enhance the problem-solving capacity. In this study, there didn't verified any significant correlation between the MAS and SAFS, and the test score. However, one of those reasons could be the fact that the very low accuracy rate of the test affected a possible relationship between them. Thus, there is still room to examine that, conducting a test with a wide range of questions and contents.

In addition, according to the author's study, there confirmed, in Fiji, no research on the Mathematics anxiety, the students' feeling of avoiding school, and the relationship between them and school attendance rate. Moreover, there is no opened data about the Mathematics test score, in which the weak points in the mathematical fields and the answering tendency are detectable. Therefore, this study is expected to be able to open, in Fiji, a research space on the issues of quality education, such as mental care of students, social supports and teaching capacity development for schooling and Mathematics education.

Since this study focused only on a girl secondary school in the capital city of Fiji due to the availability of access at that time, it is indispensable, needless to say, to widen the range of research and deepen the analysis, considering the socioeconomic and cultural Fijian context, for the sake of proposing any educational policy with respect to the nationwide issues. It is expected to be considered in future researches of mine.

Reference

- Brush, I. 1976. Mathematics Anxiety in College Students. Unpublished paper. Wesleyan University.
- Dreger, R.M. & Aiken, L.R. 1957. The Identification of Number Anxiety in College Population. *Journal of Educational Psychology*. 48, 344-351.
- Fujii, Yoshihisa. 1994. A Study on Mathematics Anxiety Rating Scale (MARS). *Japanese Journal of Educational Psychology*. 42, 448-454.
- Haraoka, Kazuma. 1972. A Factor Analysis on Truant Tendency. *Journal of the Faculty of Education, Saga University*. 20, 67-90.
- Kaneko, Hitoshi., Honjo, Shuji. & Takamura, Sakiko. 2003. The Relationship Between Self-reference and Social Phobic, Depression, and School Absenteeism Tendencies. *The Japanese Journal of Personality*. Vol.12-1, 2-13.
- Kawano, Yoshiaki. 1988. Effects of Affiliative Cues of Teachers on Children's Task Performance. *Japanese Journal of Educational Psychology*. 36, 161-165.
- Kuze, Toshio., Ninomiya, Katsumi. and Ohno, Hisashi. 1985. A Study on Junior and Senior High School Students' Adaptation to School Life. *Japanese Association of Educational Psychology 27th General Assembly Collection of Papers*. 404-405.
- Ministry of Education (MoE). 2011. *Annual Report 2010*. Suva : Ministry of Education, National Heritage, Culture and Arts, Youth and Sports.
- Ministry of Education (MoE). 2012a. *Annual Report 2011*. Suva : Ministry of Education, National Heritage, Culture and Arts, Youth and Sports.
- Ministry of Education (MoE). 2012b. *Financial Statements for the Year Ended 31 December 2011*. Suva : Ministry of Education, National Heritage, Culture and Arts, Youth and Sports.
- Ministry of Education (MoE). 2012c. *2012-2014 Education Sector Strategic Development Plan*. Suva : Ministry of Education, National Heritage, Culture and Arts, Youth and Sports.
- Ministry of Education (MoE). 2012d. *2013 Annual Business Plan*. Suva, Fiji : Ministry of Education, National Heritage, Culture and Arts, Youth and Sports.
- Morita, Yoji. 1991. *Sociology of "Truancy" Phenomena*, Tokyo : Gakubun Sha.
- Nakashima, Yoshimi & Hara, Akiko. 2009. Which is Effectual on the Measurement of the School Avoidance Feeling, by the Strength or by the Frequency? -An attempt of Measurements by both-. *The Joint Journal of the National Universities in Kyushu, Education and Humanities*. 2, 1-8.
- Reed, H.B. 1961. Teacher Variable of Warmth, Demand, and Utilization of Intrinsic Motivation Related to Pupil's Science Interest: A Study Illustrating Several Potentials of Variance-Covariance. *Journal of Experimental Education*. 29, 205-229.
- Richardson, F.C. & Suinn, R.M. 1972. The Mathematics Anxiety Rating Scale : Psychometric Data. *Journal of Counseling Psychology*. 19, 551-554.

- Satoh, Yuhkoh & Saito, Seiichi. 2001. Developmental Process of Multiple Feelings of Self-disgust during Adolescence and Adulthood. *Bulletin of Graduate School of Human Development and Environment, Kobe University*. Vol.8-2, 27-40.
- Suzuki, Manami., Asakawa, Kiyoshi., Minami, Masanori & Qi, Qiumeng. 2011. The Relations between Social Skills and Feelings of School Avoidance in College Students. *The Journal of School Education*. 23, 27-33.
- Takekuma, Manami. 2011. Education in Fiji, from an International or Multi-Ethnic Perspective. *Bulletin of Fukuoka International University*, No.25, 15-24.
- Tomishige, Kaoru & Ogura, Tamiko. 2001. *Bulletin of Graduate School of Human Development and Environment, Kobe University*. Vol.8-2, 1-12.
- Watabe, Reijirou & Sakuma, Tatsuya. 1998. A Study on Structures of Children's Arithmetic Anxiety and Methods of Teacher's Supports. *Japanese Journal of Educational Psychology*. 46. 184-192.
- Watanabe, Yoichi & Koishi, Hirofumi. 2000. A Study on the Negative Feeling toward School in Junior High School Students. *Bulletin of Graduate School of Human Development and Environment, Kobe University*. Vol.8-1, 1-12.
- Yoshida, Michio & Yamashita, Ichirou. 1987. Factors influencing the students' learning motivation and In-service Teachers' Perception. *Japanese Journal of Educational Psychology*. 35, 309-317.