International Journal of Humanities and Social Science Invention (IJHSSI)
ISSN (Online): 2319 – 7722, ISSN (Print): 2319 – 7714
www.ijhssi.org ||Volume 7 Issue 06 Ver. II ||Jun. 2018 || PP.62-69

Perspectives on Quality Mathematics Education: A Study onFiji Primary School Teachers' Attitude towards Mathematics

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ABSTRACT : *The expectation of the Ministry of Education as the sole employer for teachers, is for every Primary School Teacher in Fiji, to teach all subjects that are prescribed by the ministry with the necessary teacher qualification. Hence MOE's goal is always on quality education whereby teachers are required to bring about positive learning outcomes through effective teaching and this requires teachers' positive attitude, yet it is least considered in the selection criteria for teacher employment, thus becomes the researcher's core objective of the study. The study engrosses descriptive survey with the engagement of Stratified Random Sampling technique with the sample size of 363 Primary School Teachers, from each stratum covering the four major Divisions; Northern, Central, Western and Eastern and uses a Rating Scale namely of; Modified Version of Attitude Towards Mathematics Inventory by Moreira C.M.(1992) to find out the perceptions of teachers' attitude towards Mathematics with respect to teacher qualification and analysis of Variance(ANOVA) is used to analyse the data quantitatively. The relevance of the study is to allow the Ministry of Education in Fiji, to assist teachers with moderate attitude towards mathematics to improve its status quo, which would lead to more effective teaching of mathematics thus result to better performance of primary school students. The findings of the study are discussed in detail in the paper.*

KEYWORDS: *Attitude Towards Mathematics, Attitude towards Learning Mathematics, Attitude Towards Teaching Mathematics, Mathematics Education in Fiji*

Date of Submission: 08-06-2018 Date of aceptante: 23-06-2018

I. INTRODUCTION

Teachers' attitude towards mathematics plays a crucial role in trying to improve the quality of teaching mathematics and it can be either positive or negative. Research has shown that there is positive association of increase in teachers' content knowledge and positive attitude(Evans 2008),Ball.et. al(2005).It also means that teachers' mastery of content knowledge in mathematics builds confidence in teachers to teach and lowers anxiety. This means effective teaching with positive attitude become a necessity for quality teaching.

At times teachers' attitude can be determined by prior school experiences which could shape up one's classroom practice and this type of indoctrination could affect one's learning, and could be strong that one would carry along with, even to the teacher education institutes, and would generally contribute to the different perceptions of teachers' attitude towards the subject, in terms of enthusiasm and confidence levels. Due to differences in prior school experiences, and for teachers with negative prior experiences, one would develop a cycle of negativity which could be transferred to students unintentionally, which needs to be broken(Uusimaki 2004).

Attitude Towards Mathematics(ATM)

Attitude towards Mathematics is the pattern of behaviour and emotions associated with Mathematics, which can be positive or negative. In the present study Attitude towards Mathematics refers to teachers' views about the features of mathematics knowledge (Moreira 1992)which can be categorised in two major components as; Attitude towards Mathematics, and Attitude towards Teaching Mathematics.

Attitude towards Mathematics include: nature of mathematics, which focus teachers' views about mathematics, as a disciplined subject with specified definitions, defined facts and formulas; viewed as a subject and how it is taught, encompassing blended experiences of subject content, students and teachers which could vary within students and teachers; values of mathematics which focus on views related to its usefulness and importance in society, in terms of employment, and the ability to think clearly; and teachers' views about the subject in terms of enjoyment, confidence and competence. Considering the above, since there is some emphasis on prior school experience of teachers, in this study 'Attitude towards Mathematics' is re-phrased as 'Attitude towards Learning Mathematics.'

Alternatively, Attitude Towards Teaching of Mathematics include teachers' views about the aims of teaching mathematics which focus on application of mathematics in real life, development of thinking skills, and introduction of students into high-levelled and complex mathematics, which are integrated with other subjects. It also includes nature of mathematics which focus on theoretical principles enabling individual students to learn mathematics to its fullest and with multidimensional views; and views about teachers' behaviour in terms of classroom environment, which focus on multi-roles of a teacher, teacher-student relationship; pupil-pupil relationship; physical setting and classroom resources.

II. NEED AND IMPORTANCE OF THE STUDY

Since Tuimavana&Datt (2017) highlighted that teachers' attitude towards teaching mathematics is caused by prior school experience of teachers, and the study covered specifically one education division and special focus on upper primary teachers, the investigator tries to further examine the overall attitude of Primary school teachers of Fiji towards mathematics, considering both teachers' attitude towards learning mathematics, and teachers' attitude towards teaching mathematics.

In addition, no known studies that have been carried out for Primary School Teachers in Fiji that specifically focus on teacher Effectiveness and teachers' attitude towards mathematics. The study would throw some light on the significance of teacher effectiveness and attitude towards mathematics which could affect students' learning.

Moreover, Fiji's population is almost about 850 000 and is categorised under 'small state' category, therefore since research literature for small islands states are not plentiful, Sanga (2012), findings of such studies can be used as building blocks of local and international literature in mathematics education.

III. REVIEW OF THE RELATED LITERATURE

Kiwanuka.H.N.et al. (2017) revealed that a positive environment created by the teachers could contribute to positive students' attitude, regardless of family background. Other findings shows higher achievers have positive attitude towards mathematics and vice versa. Preparing a positive classroom environment for mathematics learning requires great commitment and positive attitude on the part of the teachers.

Tuimavana.R.,&Datt. N. (2017) highlighted that attitude of Fijian teachers towards teaching mathematics is caused by the prior school experiences of teachers which affect the way one teaches mathematics, and could be either positive or negative. Teachers with favourable prior school experience had positive attitude and is reflected on one's teaching; interesting lessons, full of fun and meaningful learning and vice versa.

Lopez-Agudo.L.A,&Marcenaro-Gutierrez (2017) revealed impact of students' engagement in gauging teaching effectiveness which showed effective use of resources during students' engagement increases teacher effectiveness. Collaborative interaction amongst teachers in sharing content knowledge and scaffolding gives teachers confidence to teach. This type of collaboration gives support to teacher effectiveness, whilst inculcate positive attitude in teachers.

Tatar E.et al.(2015) highlighted teachers' perceptions about the use of technology and computer literacy levels in mathematics teaching, on levels mathematics teaching anxiety which showed a negative relationship between teachers' mathematics teaching anxiety and perceptions about technology use in mathematics teaching. Teachers who are competent in using technology in teaching mathematics show positive attitude with less anxiety whilst teachers who are incompetent show negative attitude with more anxiety.

Casem. R.Q.(2013) revealed the effect of scaffolding on students' performance and attitude of students which showed scaffolding improved students' performance and positively affected attitude of students in learning the subject. The different approaches contributes to teacher effectiveness and enhance positive attitude in teachers as well as students.

After a critical analysis of the related literature findings, the following questions arose in the minds of the researchers:

- Whether Attitude towards Mathematics for Primary School Mathematics Teachers affect the teaching of mathematics?
- Whether Attitude towards Mathematics of Primary School Mathematics Teachers differs with respect to teacher qualification?

To find answers to these questions, the present study, "Study on Fiji Primary School Teachers' Attitude Towards Mathematics" was undertaken to contribute for quality enhancement of mathematics education in Fiji.

Operational Definitions

Attitude Towards Mathematics

Attitude towards Mathematics is the pattern of behaviour or emotions associated with mathematics. It is the positive or negative disposition towards mathematics.

In the present study Attitude towards Mathematics refers to Fiji's Primary School Mathematics Teachers' attitude towards mathematics, which include their attitude about the nature of mathematics, mathematics as a subject, mathematics and oneself and value of mathematics. In this study the component of attitude towards mathematics is rephrased as 'Attitude towards Learning Mathematics.'

In addition, teachers' Attitude Towards the Teaching of Mathematics are also considered, which includes aims of teaching mathematics, nature of mathematics learning and teaching environment. Therefore the components of attitude towards mathematics (Modified Moreira 1992) Inventory include the following:

a. Attitude towards Learning Mathematics(ALM)
1. Nature of Mathematics
2. Mathematics as a subject
3. Mathematics and oneself
4. Value of Mathematics

b. Attitude Towards Teaching Mathematics(ATTM)
5. Aims of teaching Mathematics
6. Nature of mathematics Learning
7. Teaching environment

This was measured by Mathematics Teachers' Attitude Scale which was constructed by the researchers.

Primary School Teachers(PST)

In the present study, Primary School Mathematics Teachers refer to male and female teachers in Fiji serving in different schools as various locations throughout the country, currently serving at 731 primary schools in Fiji, and are basically divided into major Divisions namely; Central Division, Northern Division, Western Division, and Eastern Division whereby the schools are further categorised as remote, rural, semi-urban and urban schools. According to Ministry Of Education Report(2011), rural schools are classified under 10 to 20km from a town boundary; and remote are greater than 20km away; in this study, semi-urban, is categorised under 4km to 9km from town boundary; and urban, within 3km within town boundary.

Primary School Mathematics Teachers are directly employed and supervised by the MOE with a minimum qualification of Primary Teacher Certificate and are required to teach all the subjects prescribed by MOE.

For the present study, teaching qualifications for Fiji Primary School Mathematics Teachers, majority of teachers are being categorised into teachers with, certificate, diploma, degree, and postgraduate qualifications.

IV. OBJECTIVES OF THE STUDY

1. To study Attitude Towards Mathematics of Primary School Mathematics Teachers of Fiji.
2. To compare Attitude towards Mathematics among Primary School Mathematics Teachers with respect to teacher qualification.
3. To compare Components of Attitude towards Mathematics among Primary School Mathematics Teachers of Fiji, with respect to teacher qualification.

Hypothesis Of The Study

1. Primary School Mathematics Teachers having different levels of teaching qualification differ significantly in Attitude towards Mathematics
2. Primary School Mathematics Teachers having different levels of teaching qualification differ significantly in Components of Attitude Towards Mathematics.

V. METHOD

The population covers all Primary School Mathematics Teachers in Fiji, which has a total of 5974 teachers in 2016, as the data was given by the Ministry of Education.

The Samplesize was obtained from using Krejcie and Morgan(1970) Sample size table.

Descriptive survey was used with engagement of Stratified Random Sampling technique, whereby a stratum from each Education District was selected, from the four Education Districts; Northern, Central, Western and Eastern.

The research tool used, was validated using Content Validity whereby, the process included elaboration of objectives and description of variables was discussed with experts in the field of educational research, who were validators.The reliability of the tool was calculated using Cronbach's Alpha.

VI. RESULTS AND DISCUSSION

The collected data were tabulated, analysed and interpreted using SPSS.

Objective 1

To study Attitude Towards Mathematics of Primary School Mathematics Teachers of Fiji.

The datawas collected by administering the tool 'Modified Version of Attitude Towards Mathematics Inventory by Moreira C.M.(1992) Rating Scale' which was analysed by calculating the mean, standard deviation and percentage. The teachers were categorisedin levels:

Favourable Attitude- Teachers who have Attitude score which is greater than Mean + 1SD

Moderate Attitude- Teachers who have Attitude score which is between Mean +1 SD toMean – 1SD.

Unfavourable Attitude- Teachers who have Attitude score which is less than Mean – 1SD.

Table 1.1: Percentage of Attitude towards Mathematics of PSMT in Fiji

Level of Attitude	N	%
Favourable	64	17.6
Moderate	245	67.5
Unfavourable	54	14.9
Total	363	100

Table 1.1 indicates that 67.5% of the teachers have moderate attitude towards Mathematics. Hence it can be concluded that Primary School Mathematics Teachers of Fiji have moderate attitude towards Mathematics.

To compare the Attitude of Primary School Mathematics Teachers, with respect to teaching qualification, the reliability of the data was calculated using Cronbach's Alpha. The details is given in Table 1.2

Table 1. 2: Reliability Statistics with respect to TQ

Cronbach's Alpha	N of Items
.442	2

Objective 2

To compare Attitude towards Mathematics among Primary School Mathematics Teachers with respect to teacher qualification.

Hypothesis 1

H_1: Primary School Mathematics Teachers having different levels of Teaching Qualification differ significantly in Attitude towards mathematics.

To test the hypothesis it was changed into null hypothesis as stated below.

H_0: Primary School Mathematics Teachers having Certificate, Diploma, B.Ed. and PG teaching qualification do not differ significantly in Attitude towards Mathematics.

The hypothesis was tested using one-way 'Analysis of Variance(ANOVA) with the level significance fixed at 0.05 level. The details are given in Table 1.3

Table 1.3: ANOVA details of ATM among PST of Fiji with respect to TQ

Source of Variation	Sum of Squares	df	Mean Square	F-value	P-value
Between Groups	1774.438	3	591.479	5.094*	.002
Within Groups	41684.885	359	116.114		
Total	43459.322	362			

*Significance at 0.05 Level

From Table 1.3 it is evident that there is a significant difference in Attitude towards Mathematics, among Primary School Mathematics Teachers having Certificate, Diploma, B.Ed. and PG teaching qualification. To find out which group differences are significant Post hoc test was done.
The details of the Post hoc test results are given in Table 1.4.

Table 1.4:Post hoc Test Results of ATM among PST of Fiji with respect to TQ

TQ Compared	Mean Difference	Std. Error	P-value	Results
Certificate and B. Ed.	3.558	1.392	.090	NS
Certificate and Diploma	.981	1.382	.918	NS
Certificate and PG	12.008*	3.711	.016	S
B. Ed. and Diploma	2.577	1.450	.369	NS
PG and B. Ed.	8.450	3.737	.166	NS
PG and Diploma	11.027*	3.733	.035	S

From Table 1.4 it is revealed that Attitude towards Mathematics of teachers with PG qualification is significantly higher than that of teachers with Certificate qualification. The Table also reveals that Attitude towards Mathematics of teachers with PG qualification is significantly higher than that of teachers with Certificate qualification.

Objective 3

To compare Components of Attitude towards Mathematics among Primary School Mathematics Teachers of Fiji, with respect to teacher qualification.

Hypothesis 2

H_2: Primary School Mathematics Teachers having Certificate, Diploma, B.Ed. and PG Teaching Qualification differ significantly in Components of Attitude towards Mathematics.
Since this hypothesis involves the study of Components of Attitude among Primary School Teachers with different levels of qualification, and to make analysis and interpretation more meaningful, two sub- hypotheses were generated from the above hypothesis as $H_{2.1}$ and $H_{2.2,}$ as stated below:
$H_{2.1}$: Primary School Mathematics teachers having Certificate, Diploma, B.Ed. and PG Teaching Qualification differ significantly in ALM Component of Attitude towards Mathematics.
Thus the null hypothesis:
$H_{0.1}$: Primary School Mathematics Teachers having Certificate, Diploma, B.Ed. and PG Teaching Qualification do not differ significantly in ALM Components of Attitude towards Mathematics.
The hypotheses were tested using one-way 'Analysis of Variance (ANOVA) with the level significance fixed at 0.05 level. The details are given in Table 1.5.

Table 1.5:Details of ALM among PSMT of Fiji with respect to TQ

Source of Variation	Sum of Squares	df	Mean Square	F-value	P-value	Results
Between Groups	409.191	3	136.397			
Within Groups	23009.542	359	64.093	2.128	.096	NS
Total	23418.733	362				

From Table 1.5 it can be revealed that there is no significant difference in Attitude towards Learning Mathematics(ALM) among teachers with Certificate, Diploma, B.Ed. and PG qualifications, hence equal among teachers with different levels of teacher qualification.
$H_{2.2}$:Primary School Mathematics teachers having Certificate, Diploma, B.Ed. and PG Teaching Qualification differ significantly in ATTM Component of Attitude towards Mathematics.

Thus the null hypothesis:

$H_{0.2}$: Primary School Mathematics Teachers having Certificate, Diploma, B.Ed. and PG Teaching Qualification do not differ significantly ATTM Components of Attitude towards Mathematics.

The hypotheses were tested using one-way 'Analysis of Variance (ANOVA) with the level significance fixed at 0.05 level. The details are given in Table 1.6.

Table 1.6:Details of Components of ATTM among PSMT of Fiji with respect to TQ

Source of Variation	Sum of Squares	df	Mean Square	F-value	P-value	Results
Between Groups	482.513	3	160.838	5.799	.001*	S
Within Groups	9956.236	359	27.733			
Total	10438.749	362				

From Table 1.6 it is evident that there is a significant difference in ATTM among teachers with Certificate, Diploma, B.Ed. and PG qualification. This indicates that at least one group is significantly higher than other groups with respect to teacher qualification.

To compare the differences, individual means are identified as given in Table 1.7

Table 1.7:Mean and SD of ATTM with respect to TQ

	Mean	Std. Deviation	Std. Error
Certificate	82.3008	5.08263	.44072
Diploma	82.7500	5.74143	.54251
B.Ed.	84.2294	4.99191	.47814
PG	88.3333	4.94975	1.64992
Total	83.1680	5.36995	.28185

To find out which group differences in terms of 'Attitude Towards Teaching Mathematics, Post hoc tests was done.. The details are given in Table 1.8.

Table 1.8: Post-hoc Test Results of ATTM with respect to TQ among Primary Teachers of Fiji

TQ Compared	Mean Difference	Std. Error	P-value	Results
Certificate and Diploma	.44925	.67538	.931	NS
Certificate and B. Ed.	1.92861*	.68041	.047	S
Certificate and PG	6.03258*	1.81383	.012	S
Diploma and B. Ed.	1.47936	.70856	.227	NS
Diploma and PG	5.58333*	1.82458	.026	S
B. Ed. andPG	4.10398	1.82645	.170	NS

From Table 1.8 it is revealed that ATTM of teachers with PG qualification is significantly higher than the teachers with Certificate qualification.

Table 1.8 also reveals that ATTM of teachers with PG qualification is significantly higher than that of teachers with Diploma qualification.

The Table also shows that ATTM of teachers with B.Ed. qualification is significantly higher than that of teachers with Certificate qualification.

Major Findings of the Study

- Primary School Teachers of Fiji have moderate level of attitude towards Mathematics
- There is a significant difference in Attitude towards Mathematics among Primary school teachers with Certificate, Diploma, B.Ed. and PG qualifications
- PG teachers' Attitude towards Mathematics is significantly higher than that of teachers with Certificate qualification
- PG teachers' Attitude towards Mathematics is significantly higher than teachers with Diploma qualification
- There is no significant difference in Attitude towards Learning Mathematics and is equal among teachers with Certificate, Diploma, B.Ed. and PG qualifications in Fiji
- There is a significant difference in Attitude Towards Teaching Mathematics among Primary school teachers with Certificate, Diploma, B.Ed. and PG qualifications
- PG teachers' Attitude Towards Teaching Mathematics is significantly higher than that of teachers with Certificate qualification.
- PG teachers' Attitude Towards Teaching Mathematics is significantly higher than that of teachers with Diploma qualification.
- B.Ed. teachers' Attitude Towards Teaching Mathematics is significantly higher than that of teachers with Certificate qualification.

VII.RECOMMENDATIONS

For quality mathematics education, in order to improve the moderate level of attitude towards mathematics among Primary School Mathematics teachers in Fiji, the Ministry of Education need to:

- Support teachers in providing Professional Development sessions on addressing issues on attitude of teachers towards mathematics, and areas of improvement.
- Invite resource personnel to run workshops on how teachers' attitude towards mathematics can be improved
- Review and develop resource materials used in Primary mathematics that would help support teachers' attitude towards mathematics
- Form clusters and teachers' network to allow teachers to share ideas and activities that would improve teachers' attitude towards mathematics
- Review class size for each class

To increase level of Attitude towards Mathematics amongst Primary School Mathematics teachers with Certificate and Diploma qualification, the Ministry of Education need to:

- Give incentives for teachers with Certificate and Diploma to upgrade their qualifications
- Encourage teachers with Certificate and Diploma qualification to form networks and to share ideas and activities that would be helpful in improvement of attitude towards mathematics

To increase level of Attitude Towards Teaching Mathematics amongst Primary School Mathematics Teachers with Certificate and Diploma qualification.

- Build up mathematics mentors within the schools to provide in-house workshops for Certificate and Diploma teachers
- Organise modelled lessons conducted by PG teachers for Certificate and Diploma teachers to observe and analyse.
- Organise a forum whereby teachers with Certificate and Diploma to voice out their perceptions on attitude towards mathematics and how to tackle these issues

CONCLUSION

From the findings drawn from this study, and if the suggested actions are implemented and monitored closely by the Ministry of Education, Primary School Teachers' attitude would be improved and teacher effectiveness would be enhanced as teachers would be confident to carry out interesting mathematics lessons and come up with creative ways to interact meaningfully with the students. In the same way, students would also be motivated to learn mathematics with clearer understanding and at the same time learning mathematics with fun. This positive learning environment would motivate the students to work harder and gain higher achievement in mathematics. Students' higher achievement in mathematics would enable one to access to a much wider range of programmes in higher education which requires mathematics. As a result the quality of higher education will be improved in general and Mathematics Education in particular.

REFERENCES

Journal Papers:

[1]. Ball.D.L.,Hill.H.C.&Bass.H.(2005). Knowing Mathematics for Teaching: Who Knows Mathematics Well Enough To Teach Third Grade and How Can he Decide? American Education 14-17, 22-27, & 43-46

[2]. Casem. R.Q.(2013). Research Article Scaffolding Strategy In Teaching Mathematics: Its Effects On Students' Performance And Attitudes.Comprehensive Journal of Educational Research.1 (*1*).pp9-19.Springer Publications. Retrieved on July, 27th 2016 from http://www.knowledgebasedpublishers.org

[3]. Evans.B.R.(2008). A Case Study of Teachers' Mathematical Content Knowledge and Attitude towards Mathematics and Teaching. Retrieved on 24thMay 2018 from http://digitalcommons.uconn.edu/nera_2008/11

[4]. Kiwanuka.H.N.,Damme.J.V., Noortgate.W.V.D., Anumedem.D.K., Vanlaar.G., Reynolds.C., &Namusisi.S. (2017). How Do Student And Classroom Characteristics Affect Attitude Toward Mathematics? A Multivariable Multilevel Analysis. School Effectiveness And School Improvement *28(1)*.pp1-21. Retrieved on 14thNovember,2017 from http://dx.doi.org/10.1080/0924353.2016.1201123

[5]. Lopez-Agudo.L.A.,&Marcenaro-Gutierrez (2017). Engaging Children in Lesson: The Role of Efficient and Effective Teachers. School Effectiveness and School Improvement *28(4)*.pp650-669. Retrieved on 26th November, 2017 from dx.doi.org/10.1080/09243453.2017.1364272

[6]. Tatar. E., Zengin.Y.,&Kagizmanli. T.B.(2015).What is the Relationship between Technology and Mathematics Teaching Anxiety? Journal of Educational Technology & Society*18 (1).*pp. 67-76.In International Forum of Educational Technology & Society. Retrieved on 7th June,2016 from http://www.jstor.org/stable/jeductechsoci.18.1.67

[7]. Tuimavana.R.,&Datt.N.(2017).Teachers' Attitude Towards Teaching Mathematics At Upper Primary Levels in Fiji's Primary Schools: A Case Study of the Western Primary Schools. International Journal of Humanities And Cultural Studies. pp 272-293. Retrieved on 21st October, 2017 from http://www.ijhcs.com/index.php/ijhcs/index

[8]. Uusimaki.L.S.(2004).Addressing Pre-service Student Teachers' Negative Beliefs and Anxieties about Mathematics. Retrieved on 24th May, 2018 from http://www.eprints.qut.ed.au/15921

Books:

[9]. Fiji Ministry Of Education.(2011). Annual Report .Suva. Fiji: Government Printers

Chapters in Books:

[10]. Sanga.K.(2012). Give Me Another NiuLupu: Enhancing Pacific Education Research Capacity. In Sanga. K.,&Kidmann. J(Eds.).Harvesting Ideas: Niu Generation Perspectives. University Of The South Pacific. Suva. USP Press .pp 8-36

Theses:

[11]. Moreira.C.(1992). Primary Teachers' Attitude Towards Mathematics and Mathematics Teaching with Special Reference to a Logo-based In-service Course. Unpublished PhD. Thesis. University of London

Raiula T.N " Perspectives on Quality Mathematics Education: A Study on Fiji Primary School Teachers' Attitude towards Mathematics"."International Journal of Humanities and Social Science Invention (IJHSSI) 7.06 (2018): 62-69.