Teachers' Efficacy Beliefs in Mathematics Teaching: A Study of Public Primary Schools in Sarawak

Julaihi, N. H.[1*], Voon, L. L.[2] and Tang, H. E.[3]
[1,2]Universiti Teknologi MARA, Cawangan Sarawak, 94300 Kota Samarahan, Sarawak.
[3]Universiti Teknologi MARA, Cawangan Sarawak, 96400 Mukah, Sarawak.

[1]norhazizah@uitm.edu.my; [2]llvoon@uitm.edu.my; [3]lily@uitm.edu.my

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ABSTRACT

The Ministry of Education in Malaysia has voiced concern over the serious problems of underachieving primary school students in Mathematics. While the Ministry is gearing its education direction towards a new generation of STEM experts, the teachers have been assigned to shoulder the movement of the vision. Hence, their views must be understood. A study was conducted among 66 Mathematics teachers from 39 public primary schools in the sub-urban district of Samarahan in Malaysia to understand their mathematics teaching efficacy. The Mathematics Teaching Efficacy Beliefs Instrument (MTEBI) by Enochs, Smith and Huinker (2000) was adapted and used in the data collection. Quantitative data analysis methods include descriptive statistics and the analysis of variance. The results indicated that the teachers were confident of their efficacy in Mathematics teaching. Specifically, the teachers' personal efficacy was slightly lower than outcome expectancy. In addition, there was a moderate positive significant relationship between teachers' personal efficacy and outcome expectancy. Gender, years of Mathematics teaching experience and highest education attained were not significant to teachers' efficacy.

Keywords: *Malaysian education, Mathematics teaching, teacher efficacy beliefs, Sarawak*

INTRODUCTION

Strengthening Science, Technology, Engineering and Mathematics (STEM) initiative was outlined in the Malaysia Education Blueprint 2013-2025 (Ministry of Education Malaysia (MoE), 2012). This initiative aims to ensure Malaysia has a sufficient number of qualified STEM graduates to fulfill the employment needs of the industries that support its economy. In order to integrate the STEM education in primary schools, MoE has implemented Standard Based Curriculum for Primary Schools (KSSR) in year 2011 and revamped Primary School Evaluation Test (UPSR) examination format in year 2016, with more higher order thinking skills (HOTs) questions being added (Malaysian Examination Syndicate, 2020).

Nevertheless, there has been growing concern on primary school students' underachievement in Mathematics due to the implementation of the revised UPSR. Figure 1 shows the national passing percentage in UPSR Mathematics from year 2016 until 2019. Although the results showe ... grade D and E ... d 49.3% student ... 1).

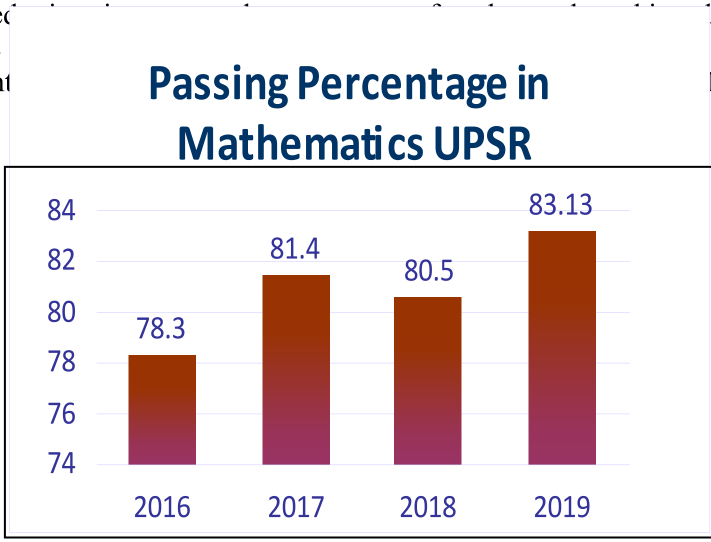

Table 1: UPSR Mathematics Results by Grades

Year	Mathematics UPSR Results (%)						Number of Candidates
	A	B	C	D	E	D+E	
2019	19.43	16.84	16.63	30.23	16.87	47.1	431610
2018	18.22	15.52	16.96	29.80	19.50	49.3	427126

(Source: Malaysian Examination Syndicate, 2020)

While MoE is gearing its education direction towards a new generation of STEM experts, students' performances in Mathematics remain a major concern as there are still many underachieving students especially in the sub-urban area. As teachers are the ones shouldering the movement of the vision and they are the important factor contributing to student achievement, it is important to understand their efficacy beliefs in Mathematics teaching. Understanding this factor is directly associated with the increase of students' achievement in Mathematics.

This paper aims to share some of the findings on teachers' efficacy beliefs in Mathematics teaching. In specific, this paper is guided by the following research questions: (1) How do teachers rate their personal Mathematics efficacy, their outcome expectancy and their overall Mathematics teaching efficacy? (2) Are there any significant differences in the mean scores for teachers' efficacy based on gender and highest education attained? (3) Are there any significant relationships among years of Mathematics teaching and Mathematics teaching efficacy?

LITERATURE REVIEW

The literatures on teachers' beliefs about their efficacy in Mathematics teaching, particularly from the viewpoint of elementary teachers are reviewed.

Teachers' Efficacy in Mathematics Teaching

Bandura's social cognitive theory stated self-efficacy as one's beliefs about their own faculty or capability to cope, work out and accomplish goals (Bandura, 1977). This belief system sets the attitudes, and it is dynamic as it may gradually change through experiences gained from circumstances or situations, hence a cooperative relation (Philippou

& Christou, 2002). Teacher efficacy is defined as the beliefs and perceptions of teacher concerning his/her ability to teach and to create anticipated after-effects in students' achievement (Tschannen-Moran, Hoy & Hoy, 1998). A teacher's efficacy determines the atmosphere of classroom learning (Gordon, 2001), the manner knowledge is delivered to students (Henson, 2001) and the learning approaches and learning interests that will be adopted in mathematics teaching (Philippou & Christou, 2002). Studies have also acknowledged the importance of teacher efficacy towards students' motivation and performances (Norton, 2017; Minghui, Lei, Xiaomeng & Potme, 2018).

The level of a teacher's efficacy affects the level of the expected outcomes (Bandura, 1986). Mathematics teachers who have high efficacy in Mathematics teaching will design their teaching methods and activities carefully, be receptive to innovative proposals, deliver instructions effectively, be eager to inspire students towards Mathematics and show great commitment (Deniz & Koç, 2020; Hoy & Spero, 2005). On the contrary, a Mathematics teacher with low self-efficacy would not meet the aptitudes of teaching vocation. A Mathematics teacher who perceives himself/herself as "I can't, or I am not good in teaching" will develop dislikes for Mathematics teaching and avoid teaching difficult topics. Nevertheless, a teacher self-efficacy can be increased through application of microteaching model and on-the- ground experience (Bandura, 1981).

The current study conceptualizes the teacher efficacy model developed by Enochs, Smith and Huinker (2000) based on Bandura's social learning theory. The sample's teacher efficacy is acquired in the 24 items adapted from Mathematics Teaching Efficacy Belief Instrument (MTEBI) that has two constructs namely self-efficacy and outcome expectancy with regards to Mathematics teaching. MTEBI was originated from Science Teaching Efficacy Belief Instrument (STEBI-B) (Enochs & Riggs, 1990). Self-efficacy is measured using the Personal Mathematics Teaching Efficacy Belief Scale while outcome expectancy is measured using the Mathematics Teaching Outcome Expectancy Scale. The number of items and the items descriptions of both constructs depicted in MTEBI questionnaire are shown in Table 2.

It is examined that among the common variables that were researched on pre-service teacher self-efficacy were gender, term of service, education attained and place of work. Bülent and Murat (2016) reported that pre-school teachers' seniority and workplace (rural/urban) had no effects on MTEBI scores and of all sub-constructs of MTEBI. However, a significant difference in the outcome expectancy construct of MTEBI scores based on their graduation program was recorded.

Table 2: Constructs of Teacher Efficacy Captured by MTEBI Questionnaire

Sub-Constructs	No. of items	Description of items
Personal Mathematics Teaching Efficacy Belief Scale (SE)	13	Measures teachers' beliefs on their own capability to teach Mathematics. (Items 2, 3, 5, 6, 8, 12, 17, 18, 19, 20, 21, 22, 23)
Mathematics Teaching Outcome Expectancy Scale (OE)	11	Measures teachers' beliefs that students' Mathematics learning can be impacted by effective teaching. (Items 1, 4, 7, 9, 10, 11, 13, 14, 15, 16, 24)

To this date, literatures on teachers' efficacy beliefs in Mathematics teaching from the sub-urban schools are scarce, and this motivates the current study which sought to understand in-service primary school teachers' efficacy in Mathematics teaching who are teaching in the sub-urban area.

METHODS

In this study, the survey research method was chosen as it seemed to be the most systematic and comprehensive way to obtain the personal opinion and perception of people. This paper aims to investigate teachers' efficacy beliefs in Mathematics teaching in sub-urban public primary schools. Quantitative data were collected to elicit responses to the research questions of this study.

Instrument

The questionnaire was divided into two sections. Section A required the demographic profiles of the respondents. The demographic profiles enlisted the respondents' gender, age, ethnicity, marital status, highest education, years of teaching Mathematics, current type of school, comfort level and knowledge level of teaching Mathematics subject. Section B sought to obtain the respondents' feedback on teachers' efficacy beliefs in Mathematics teaching. The questionnaire from this section was taken and adapted from Mathematics Teaching Efficacy Belief Instrument (MTEBI) developed by Enochs, Smith and Huinker (2000). It consisted of 24 items and incorporated two constructs i.e. personal Mathematics teaching efficacy and outcome expectancy, as stated in Table 2. The output from reliability analysis showed a Cronbach's Alpha of 0.84 suggesting very good internal consistency reliability for the scale of the 24 items in this section. For section B, the respondents were asked to rate each item using 5-Likert scale: 1 for 'strongly disagree', 2 for 'disagree', 3 for 'uncertain', 4 for 'agree' and 5 for 'strongly agree'.

Sample of Study and Data Collection Method

The data were collected during the Mathematics Excellence Program for Samarahan District Primary Schools which was held at Universiti Teknologi MARA, Cawangan Sarawak, Samarahan Campus. This one-day program was attended by 117 Mathematics teachers from the whole 50 public primary schools in Samarahan Division. The questionnaire was given out to the teachers at the beginning of the program, and they were asked to answer the questionnaire which took them approximately 10-15 minutes to complete. At the end of the program, the completed forms were returned to the researchers. However, only 66 samples from 39 schools could be analyzed due to the incomplete questionnaires received from the respondents.

Data Analysis Method

The data analysis included the calculation of descriptive statistics, such as mean and standard deviation, and the calculation of inferential statistics which comprised analysis of variance.

RESULTS

The results of descriptive and inferential statistics are presented in this section, in relation to answering the research questions. Descriptive findings, which include mean and standard deviation necessary to frame the remainder of the findings, are presented first. Statistical findings in relation to Analysis of Variance (ANOVA) follow thereafter.

Demographic Profiles of the Respondents

Table 3 illustrates the demographic profiles of the teachers who are the respondents of this study. The 66 teachers volunteered to answer the questionnaires completely with 39 females (59.1%) and 27 males (40.9%). The mean age of the sample was 40.85 years (SD = 7.021 years). Out of the 66 respondents' ethnicity, 30 of them (45.5%) were Malays, followed by 15 Chinese (22.7%), 8 Bidayuh (12.1%), 6 Iban (9.1%), 3 Melanau (4.5%) and 4 others (6.1%). Majority of the respondents were married (n = 61, 92.4%) whereas 5 of them (7.6%) were single. With regards to highest education, 50 teachers earned a Degree, 9 teachers earned a Certificate, 5 with Diploma and 2 earned Master. The average years of teaching Mathematics subject was 12.70 years (SD = 7.258 years).

Generally, these teachers are senior teachers with rich experience in the teaching profession. A total of 57 teachers came from the SK type of schools, followed by 8 teachers from the SJK type of schools and one teacher came from the SKA type of school. 45.5% of the teachers (n = 30) rated moderate comfort level for teaching Mathematics, followed by 39.4% of the teachers (n = 26) rated nearly high comfort level for teaching Mathematics. 53.0% of the teachers (n = 35) rated moderate knowledge level for teaching Mathematics, followed by 40.9% of the teachers (n = 27) rated nearly high knowledge level for teaching Mathematics. The mean comfort level for teaching Mathematics was 3.61 (SD = 0.742), whereas the mean knowledge level for teaching Mathematics was 3.53 (SD = 0.613). The result indicated that the teachers were at the moderate comfort level and knowledge level for teaching Mathematics.

Table 3: Demographic Profiles of the Samples

Demographic profiles	**Total**
Gender (n=66)	
Male	27 (40.9%)
Female	39 (59.1%)
Age (Mean ± SD) (n=66)	40.85 ± 7.021
Ethnicity (n=66)	
Malay	30 (45.5%)
Chinese	15 (22.7%)
Iban	6 (9.1%)
Bidayuh	8 (12.1%)
Melanau	3 (4.5%)
Others	4 (6.1%)
Marital Status (n=66)	
Single	5 (7.6%)
Married	61 (92.4%)
Highest Education (n=66)	
Master	2 (3.0%)
Degree	50 (75.8%)
Diploma	5 (7.6%)
Certificate	9 (13.6%)
Years of Teaching Mathematics (Mean ± SD) (n=66)	12.70 ± 7.258
Current School (n=66)	
National School (Sekolah Kebangsaan-SK)	57 (86.4%)
Chinese/Tamil National School (Sekolah Jenis Kebangsaan-SJK)	8 (12.1%)
Religious National School (Sekolah Kebangsaan Agama-SA)	1 (1.5%)
Comfort Level of teaching Mathematics(Mean ± SD) (n=66)	3.61 ± 0.742
Very low	0 (0%)
Low	2 (3.0%)
Moderate	30 (45.5%)
High	26 (39.4%)
Very high	8 (12.1%)
Knowledge Level of teaching Mathematics (Mean ± SD) (n=66)	3.53 ± 0.613
Very low	0 (0%)
Low	0 (0%)
Moderate	35 (53.0%)
High	27 (40.9%)
Very high	4 (6.1%)

Teachers' Efficacy Beliefs in Mathematics Teaching

Table 4 demonstrates the itemized scores of teachers obtained from MTEBI. The highest mean value was 4.24 (SD = 0.634) for the item "When teaching Mathematics, I usually welcome student questions". This is followed by "I am continually finding better ways to teach Mathematics" with a mean value 4.21(SD = 0.713) and "I am typically able to answer students' Mathematics questions" with a mean value 4.02 (SD = 0.644).

21 items scored the mean values less than 4.00 but greater than 3.00: "When the Mathematics grades of students improve, it is most often due to their teacher having found a more effective teaching approach" with a mean value 3.95 (SD = 0.666), "I know the steps necessary to teach Mathematics concepts effectively" with a mean value 3.85 (SD = 0.561), "I understand Mathematics concepts well enough to be effective in teaching elementary Mathematics" with a mean value 3.82 (SD = 0.579), "The low Mathematics achievement of some students cannot generally be blamed on their teachers" with a mean value 3.79 (SD = 0.775), "Increased effort in Mathematics teaching produces little change in some students' Mathematics achievement" with a mean value 3.79 (SD = 0.775), "If parents comment that their child is showing more interest in Mathematics at school, it is probably due to the performance of the child's teacher" with a mean value 3.77 (SD = 0.837), "When a student does better than usual in Mathematics, it is often because the teacher exerted a little extra effort" with a mean value 3.76 (SD = 0.725).

Table 4: The Itemized Scores of Teachers Obtained from MTEBI

No.	Item	Mean	Std. Dev
1	When a student does better than usual in Mathematics, it is often because the teacher exerted a little extra effort.	3.76	.725
2	I am continually finding better ways to teach Mathematics.	4.21	.713
3	Even when I try very hard, I don't teach Mathematics as well as I do most subjects.	3.20	1.026
4	When the Mathematics grades of students improve, it is most often due to their teacher having found a more effective teaching approach.	3.95	.666

5	I know the steps necessary to teach Mathematics concepts effectively.	3.85	.561
6	I am not very effective in monitoring Mathematics activities.	3.20	.881
7	If students are underachieving in Mathematics, it is most likely due to ineffective teaching.	3.29	.780
8	I generally teach Mathematics ineffectively.	3.14	1.021
9	The inadequacy of a student's Mathematics background can be overcome by good teaching.	3.74	.640
10	The low Mathematics achievement of some students cannot generally be blamed on their teachers.	3.79	.775
11	When a low achieving child progresses in Mathematics, it is usually due to extra attention given by the teacher.	3.59	.928
12	I understand Mathematics concepts well enough to be effective in teaching elementary Mathematics.	3.82	.579
13	Increased effort in Mathematics teaching produces little change in some students' Mathematics achievement	3.79	.775
14	The teacher is generally responsible for the achievement of students in Mathematics.	3.74	.810
15	Students' achievement in Mathematics is directly related to their teacher’s effectiveness in Mathematics teaching.	3.76	.805
16	If parents comment that their child is showing more interest in Mathematics at school, it is probably due to the performance of the child's teacher.	3.77	.837
17	I am typically able to answer students' Mathematics questions.	4.02	.644
18	I wonder if I have the necessary skills to teach Mathematics.	3.58	.842
19	Effectiveness in Mathematics teaching has little influence on the achievement of students with low motivation.	3.58	.860
20	Given a choice, I would not invite the principal to evaluate my Mathematics teaching.	3.05	.902
21	When a student has difficulty understanding a Mathematics concept, I am usually at a loss as to how to help the student understand it better.	3.14	1.036
22	When teaching Mathematics, I usually welcome student questions.	4.24	.634
23	I don't know what to do to turn students on to Mathematics.	3.42	.895
24	Even teachers with good Mathematics teaching abilities cannot help some kids learn Mathematics.	3.12	.920

"Students' achievement in Mathematics is directly related to their teacher's effectiveness in teaching" with a mean value 3.76 (SD = 0.805), "The inadequacy of a student's Mathematics background can be overcome by good teaching" with a mean value 3.74 (SD = 0.640), "The teacher is generally responsible for the achievement of students in Mathematics" with a mean value 3.74 (SD = 0.810), "When a low achieving child progresses in Mathematics, it is usually due to extra attention given by the teacher" with a mean value 3.59 (SD = 0.928), "Effectiveness in Mathematics teaching has little influence on the achievement of students with low motivation" with a mean value 3.58 (SD = 0.860), "I wonder if I have the necessary skills to teach Mathematics" with a mean value 3.58 (SD = 0.842).

"I don't know what to do to turn students on to Mathematics" with the lowest mean value 3.42 (SD = 0.895), "If students are underachieving in Mathematics, it is most likely due to ineffective teaching" with a mean value 3.29 (SD = 0.780), "I am not very effective in monitoring Mathematics activities" with mean value 3.20 (SD = 0.881), "Even when I try very hard, I don't teach Mathematics as well as I do most subjects" with a mean value 3.20 (SD = 1.026), "I generally teach Mathematics ineffectively" with a mean value 3.14 (SD = 1.021), "When a student has difficulty understanding a Mathematics concept, I am usually at a loss as to how to help the student understand it better" with a mean value 3.14 (SD = 1.036), "Even teachers with good Mathematics teaching abilities cannot help some kids learn Mathematics" with a mean value 3.12 (SD = 0.920) and "Given a choice, I would not invite the principal to evaluate my Mathematics teaching" with a mean value 3.05 (SD =0.902).(I believe this section needs better way of reporting the results)

Table 5 shows the mean scores of respondents' teaching efficacy in Mathematics. In overall, the mean value score for the above 24 items was 3.64 (SD = 0.34), which indicated that the teachers nearly agreed on their efficacies in Mathematics teaching.

Table 5: Mean MTEBI Scores of Teaching Efficacy in Mathematics

	N	Minimum	Maximum	Mean	Std. Deviation
Mean_Efficacy	66	2.70	4.30	3.6350	.33617

Table 6 shows the mean score for personal Mathematics teaching efficacy belief (13 items) and outcome expectancy (11 items) with regards to Mathematics teaching. In overall, the mean score for personal Mathematics teaching efficacy belief was 3.64 (SD = 0.34) which indicated that the teachers nearly agreed on their personal Mathematics teaching efficacy. On the other hand, the mean score for outcome expectancy was 3.85 (SD = 0.36) which indicated that the teachers nearly agreed on Mathematics teaching outcome expectancy.

Table 6: Mean Personal Efficacy and Mean Outcome Expectancy

	Mean_Personal Efficacy	Mean_Outcome Expectancy
N	66	66
Mean	3.6350	3.8528
Std. Deviation	.33617	.36462

Table 7 shows that there was a moderate positive significant relationship between teachers' mean score for personal Mathematics teaching efficacy and mean score for outcome expectancy ($r = 0.566$; $p < 0.05$).

Table 7: Correlations between Teachers' Mean Personal Mathematics Teaching Efficacy and Mean Outcome Expectancy

		Mean Efficacy	Mean Outcome
Mean_Personal Efficacy	Pearson Correlation	1	.566**
	Sig. (2-tailed)		.000
	N	66	66
Mean_Outcome Expectancy	Pearson Correlation	.566**	1
	Sig. (2-tailed)	.000	
	N	66	66

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

Table 8 shows the mean score of respondents' teaching efficacy in Mathematics according to gender. The mean efficacy value for male teachers was 3.67 (SD=0.33; n=27) whereas the mean efficacy value for female teachers was 3.61 (SD=0.34; n=39). Both groups did not differ much in terms of their efficacies in Mathematics teaching.

Table 8: Scores of Teaching Efficacy in Mathematics across Gender

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Mean_Efficacy	Male	27	3.6715	.33163	.06382
	Female	39	3.6098	.34125	.05464

The Levene's Test for Equality of Variances (Table 9) shows that there were equal variances between male and female teachers (p>0.05) Hence. t-test was carried out. Based on the t-test output, there was no significant difference in teachers' efficacy beliefs in Mathematics teaching between male and female teachers.

Table 9: T-test on Teaching Efficacy between Male and Female Teachers

Mean_ Efficacy	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95%Confidence Interval of the Dif. Lower	Upper
Equal variances assumed	.004	.951	.730	64	.468	.06169	.08446	-.10705	.23042
Equal variances not assumed			.734	57.098	.466	.06169	.08402	-.10655	.22993

From the descriptive statistics output (Table 10), the highest mean score for Mathematics teaching efficacy items is seen in the Master holder group (Mean = 3.89; SD= 0.03; n = 2). The Certificate holder group recorded the second highest mean efficacy (Mean = 3.65; SD= 0.45; n = 9). This is followed by Degree holder group (Mean = 3.63; SD=0.30, n = 50). The lowest mean is seen in the Diploma holder group (Mean = 3.52; SD= 0.53; n = 5). The standard deviation showed that the Diploma holder group has the highest standard deviation, whereby Master holder group has the lowest standard deviation. Meaning that, the distribution of mean efficacy for Diploma holder group was more dispersed as compared to mean efficacy for Master holder group.

Table 10: The Teaching Efficacy in Mathematics by Levels of Education

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Master	2	3.8913	.03074	.02174	3.6151	4.1675	3.87	3.91
Degree	50	3.6339	.29957	.04237	3.5488	3.7190	3.00	4.30
Diploma	5	3.5217	.53250	.23814	2.8606	4.1829	2.70	4.13
Certificate	9	3.6473	.44945	.14982	3.3019	3.9928	3.00	4.22
Total	66	3.6350	.33617	.04138	3.5524	3.7177	2.70	4.30

Test of homogeneity of variances (Table 11) showed p < .05 (Levene = 3.350), which means there was no homogeneity in the variances between teachers' highest education groups. Kruskal Wallis Test was used to compute the differences of mean value of teachers' efficacy beliefs in Mathematics teaching among the four groups.

Table 11: Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
e3.350	3	2	.025

The Kruskal Wallis Test (Table 12) showed no significant differences in the mean score of teachers' efficacy beliefs in Mathematics teaching among the four groups of teachers' highest education (**Error! Reference source not found.**=2.192; df=3; p >.05). Therefore, we do not reject null hypothesis. As a conclusion, there was no significant difference in the mean score of teachers' efficacy beliefs in Mathematics teaching based on different highest education groups.

Table 12: Kruskal Wallis Test of Mean Scores of Teaching Efficacy in Mathematics

	Chi-Square	df	Asymp. Sig.
Mean_Efficacy	2.192	3	.533

Table 13 shows that there was no significant relationship between teachers' years of teaching Mathematics and mean score of teachers' efficacy beliefs in Mathematics teaching (r=0.037; p>0.05).

Table 13: Correlations between Teachers' Years of Teaching Mathematics and Teaching Efficacy in Mathematics

		Mean score of teaching efficacy in Mathematics
Years of Teaching Mathematics	Pearson Correlation	.037
	Sig. (2-tailed)	.769
	N	66

DISCUSSION

This study sets out to improve understanding on primary school Mathematics teachers' belief system as expressed in research question 1. It is shown that teachers' efficacy beliefs in Mathematics teaching was moderately high. This finding implies that the teachers were confident on their efficacy in Mathematics teaching. This is consistent with the finding by Julaihi, Liew, Voon and Ahmad Bakri (2019) which indicated that teacher's confidence level and efficacy beliefs in teaching mathematics are two closely reticulated constructs and strongly correlated. Tschannen-Moran and Hoy (2001) reported that the efficient teaching of a teacher is determined by his or her teaching efficacy. Therefore, high teaching efficacy is important in teachers teaching Mathematics. In addition, there was a moderate positive significant relationship between teachers' personal efficacy and outcome expectancy. This pattern indicates that teachers with low personal Mathematics teaching efficacy tend to consistently rate themselves as low in self efficacy belief, or otherwise.

Additionally, teachers' personal efficacy was slightly lower than outcome expectancy. This result may indicate that the teachers believed they might not be the most knowledgeable in their discipline. This is consistent with Wang, Moore, Roehrig and Park (2011) who reported that most teachers have not learned disciplinary content based on STEM contents and not taught with STEM integration. However, the teachers have sufficient Mathematics knowledge and are able to assist students' learning. They are also willing to venture into new teaching strategies for improvement (Diane, 2008).

As for research question 2 and 3, this study discovered that there was no significant difference in Mathematics teaching efficacy between male and female teachers. In addition, there was no significant difference in the mean score for the Mathematics teaching efficacy items based on different highest education groups. Furthermore, there was no significant relationship between teachers' years of teaching Mathematics and mean score for Mathematics teaching efficacy ($r = 0.037$; $p > 0.05$). All these results featured that they are parallelled to Gulistan, Hussain and Mushtaq (2017) and Alrefaei (2015) that gender, years of Mathematics teaching experience and highest education attained were not significant to teachers' efficacy.

CONCLUSION

This study has added values to the body of knowledge that advances the understanding on efficacy belief of the Mathematics teachers serving in the public primary schools of Sarawak. The results indicated that the teachers' efficacy beliefs in Mathematics teaching were moderately high. In specific, there was a moderate positive significant relationship between teachers' personal efficacy and outcome expectancy. In this regard, teacher's efficacy belief, which is defined as teachers' sense of personal ability to organize and execute their teaching (TIMSS, 2011) can lead to better student performance in mathematics. Whether a teacher teaches efficiently or otherwise is prominently determined by his or her teaching efficacy.

This study has some limitations to be pointed out. The small sample size may influence the results of the study. Thus, increasing the sample size can give more reliable results with greater precision and power. In view of the unique socioeconomic environment and cultural aspects of Samarahan as a sub-urban district in Malaysia, the generalization of these results to other countries must be done cautiously.

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