

Level of Teacher's Readiness towards the Implementation of Dual Language (Dual Language Program) in Mathematics Subjects in Schools - Inland Schools, Sarawak

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Abstrak

Dalam dunia pendidikan pada masa kini, memerlukan guru bersedia dalam melengkapkan ilmu pengetahuan mereka sama ada konteks ilmu pengetahuan secara teoretikal dan praktikal. Salah satu yang perlu dikuasai oleh guru adalah penerapan Dual Language Programme (DLP) yang diimplementasikan dalam pengajaran subjek Sains dan Matematik. Ini dilakukan bagi memberikan persediaan ilmu pengetahuan yang cukup kepada guru untuk mendepani cabaran pendidikan dalam era globalisasi. Justeru kajian ini, dilakukan untuk meneliti tahap kesediaan guru pedalaman Sarawak dalam penggunaan DLP dalam pengajaran matematik. Kajian ini, adalah berbentuk kajian kes, yang dilakukan ke atas 80 orang responden guru Matematik sekolah menengah di pedalaman Sarawak. Pemilihan responden dilakukan dengan menggunakan kaedah pensampelan bertujuan. Analisis data dilakukan dengan bantuan perisian Statistical Packages for Social Science (SPSS) versi 23.0 untuk menganalisis hipotesis kajian yang telah dibina. Dapatan kajian menunjukkan bahawa tahap kesediaan guru berada pada tahap yang baik iaitu nilai min 4.3389 dalam pelaksanaan dan nilai standard deviation 7.4039 manakala tahap penggunaan DLP nilai min adalah 4.2109 dan nilai standard deviation adalah 61835. Selain itu dapatan kajian turut mendapati kemudian terdapat hubungan signifikan yang positif antara tahap kesediaan guru dengan penggunaan DLP dalam matapelajaran matematik. Sehubungan dengan itu, dicadangkan pada masa akan datang perlu mewujudkan lebih banyak kajian dalam konteks DLP dalam mata pelajaran matematik demi mewujudkan lebih banyak korpus ilmu pengetahuan baharu.

Kata Kunci: Dual Language Programme (DLP), kesediaan guru, penggunaan bahasa Inggeris, Sains dan Matematik

Abstract

In today's world of education, teachers need to be prepared to complete their knowledge both in the context of theoretical and practical knowledge. One of the things that teachers need to master is the application of the Dual Language Program (DLP) which is implemented in the teaching of Science and Mathematics. This is done to provide teachers with sufficient knowledge to face the challenges of education in the globalization era. Therefore, this study

was conducted to examine the level of readiness of teachers in the interior of Sarawak in the use of DLP in teaching mathematics. This study, is in the form of a case study, which was conducted on 80 secondary school mathematics teacher respondents in the interior of Sarawak. The selection of respondents was done using purposive sampling. Data analysis was done with the help of Statistical Packages for Social Science (SPSS) version 23.0 software to analyze the research hypothesis that had been constructed. The findings of the study show that the level of teacher readiness is at a good level which is the mean value of 4.3389 in the implementation and the standard deviation value is 7.4039 while the level of DLP use the mean value is 4.2109 and the standard deviation value is 61835. In addition, the findings of the study also found that there is a significant positive relationship between the level of teacher readiness with the use of DLP in mathematics subjects. In relation to that, it is suggested that in the future it is necessary to create more studies in the context of DLP in mathematics subjects in order to create more corpus of new knowledge

Keywords: Dual Language Program (DLP), Teacher Readiness, Use of English, Science and Mathematics

Introduction

The learning of mathematics in the Dual language programme (DLP) is one of the teachings and learning approaches in improving the level of knowledge within students within the study of mathematic (Unting and Yamat, 2017). Learning through the DLP will help students in sourcing for additional mathematic learning materials within the English language in order to improve on their knowledge and their level of comprehension in the subject of mathematics. In relation to that, teacher plays a pivotal role in exposing these by teaching them mathematics in using DLP so that the students are more proactive and dynamic in learning mathematic effectively.

The needs and claims by today's educational system needed a more proactive effort in ensuring the implementation of the education system is able to go in parallel with the current scenarios that are happening right now, which is full of challenges and fierce competitions which happens actively in such a dramatic and drastic development. (Abdul Rashid et al. 2019). Because of that, this is a responsibility that needs to be emphasize by the teacher so that all the wishes and goals of the educational system can be achieve.

In relation to that, in Malaysia, the government has developed a strategic plan in ensuring that the goals can be achieve successfully, which is the Malaysian Education Development Plan or PPPM 2013 – 2025. Based on the guidelines given by the Ministry of Education (MOE), PPPM 2013 – 2025 will carry out three phases, which are widely known as waves, in providing a more immersive English environment and that is

Wave 1 (2013-2015): Strengthening existing systems.

Wave 2 (2016-2020): Introducing structural changes.

Wave 3 (2021-2025): Expanding said structural changes.

In relation to this matter, DLP has been approved within the National Economic Council Meeting No. 21/2015 on 13 October 2015 (MOE, 2015). The idea and foundation of DLP started in the year 2018 on a national level to improve on the existing educational policy. On this level, it emphasizes the teaching of mathematics and science in the English language.

The learning of mathematics and science in the English language is carried out to develop role models that are more capable and knowledgeable. Because of that, the English language is an important subject as it is a language of knowledge. (Nor Fadila et al. 2019). A lot of sources or written materials are translated in the English language. That is why, the knowledge of the English language is an important aspect needed to be fully grasped by the students. In relation to this, it is carried out to ensure that students can compete and continue on with their studies within the country. Moreover, it also gives students opportunities to go out and furthering their studies abroad.

The importance of the English language in a subject will prepare the students in facing the occupational world later in their life. (Norhisham et al. 2018). However, the implementation of the DLP is difficult to be carried out in Malaysia. This is due to the teaching and learning activities are often carried out in the Malay language since long ago.

Through the observations that has been carried out by researchers shows that there are not many studies that has been carried out pertaining to DLP. This is due to the implementation of DLP is still considered new and still need more further studies. Amongst the researchers that has studied DLP are as follows.

According to Hamaludin et al (2019), his findings shows that teachers with high level of readiness will aid greatly in the implementation of teaching and learning within the DLP in schools. However, he concludes that not all schools have these teachers with high level of readiness especially the teachers that are posted within the interior part of the region. The implementation of DLP in teaching needs a long amount of time before it is accultured within the teacher's teaching and learning approaches. This is implemented in ensuring the teachers can be thoroughly ready to successfully face the challenges ahead. These findings are in line with the result of the research (Shamsudin et al. 2018) which shows that the level of readiness in teachers are high but despite this however, the level of competency of teachers in using the English language in their teaching and learning are low.

There are also some studies that focuses on the challenges in implementing the DLP, as stated in the study of (Unting and Yamat, 2017), their findings show that there are many challenges in implementing the DLP in schools in teaching and learning of mathematic. This is because of the parents' background where they mainly use their mother tongue and lack of good educations causes their children to have less knowledge in the English language. This situation will surely give constraints to the teacher in teaching mathematic in the context of DLP. In addition, the issues of teaching and applications of DLP among the teachers also arises due to the absence of a guideline in implementing DLP in schools. Due to this, it causes the teachers to be in a state of disarray and confused in making preparations for themselves in implementing the DLP as a language medium for the students.

A study about the perception and experience of science teachers in relation to the curricular changes that focuses on the implementation of the DLP has been carried out by Nasri et al (2018), his analysis of the study shows that teaching science in the English language can help students to explore a lot more knowledge due to the abundance of sources and mathematic teaching materials that are in the English language. So of course, that students with higher level of proficiency in the English language can become more competitive.

Based on previous studies, it was known that there are too many research gaps that new studies need to cover in order to solve the issue of the DLP being implemented in schools. The need of a study on this is important in ensuring that the state of the educational curriculum is at an excellent level. Within the previous studies conducted, it was found that

there has not been any study conducted regarding the implementation of the DLP in the rural areas. Previous studies conducted was only in general, which was done in the urban settings. Which is why, this study is significant to be conducted in effort of solving these theoretical and practical problems in teaching the English language.

Problem Statement

It is undeniable that there are a lot of many implementations in teaching mathematics in the English language to strengthen the nation's educational system. This is done as a preparation for teachers in overcoming the challenges and needs for the success of the implementation of the curriculum. (Kanafadzi & Jamaludin, 2021). However, the effects of the lack of studies in the implementation of the DLP in Malaysia especially within the interior parts of Sarawak has caused varieties of constraints.

The effects of the lack of knowledge within the teachers in implementing teaching and learning in the DLP has become a serious problem that are faced by the teachers themselves. Which is why, it will cause coercions between the teacher to continue the teaching activities effectively and excellently. The level of readiness amongst the teachers is an important aspect in ensuring the teacher can really implement the responsibility of teaching the DLP effectively. (Suliman et al., 2020)

The problem with the lack of knowledge among the teachers is that the English language is not the primary option of the present teachers during their time of studies. This situation forced them to study the English language and tried hard to adapt the language into their teaching of mathematic. Tan (2011) Of course, it will take a significant amount of time to ensure the teaching and learning in the English language can be implemented successfully. It will surely create constraints amongst the teachers for them to realize their responsibilities as an educator. Therefore, it requires proactive and systematic effort that can help give teaching and guidance to the teachers so that they can be more prepared in facing the challenges in the learning of the English language more successfully. For example, through teaching professionalism development training, attending courses, seminars and many more program that can improve the teachers' knowledge in teaching mathematics in the DLP. (Yunus & Sukril, 2017)

Beside this, to implement the teachings in the DLP, there are many challenges that occurred. Among them are the level of readiness of the teachers being low, from the angles of pedagogical knowledge, language abilities, communications. The effects of these challenges cause problems for implementing the teachings in the context of the DLP in schools. Results from these shortcomings has contributed to the low implementation of the DLP, which also causes the ineffectiveness of the DLP in the primary schools. Relating to this, the study gap here is the level of readiness of teachers and the use of the DLP in school in terms of teaching mathematics in the interior schools of Sarawak. For that reason, this study deserves to be implemented in effort to not just create a new corpus of knowledge that can solve these practical problems in teaching within the DLP, but also improving the level of achievement of mathematics in students holistically from time to time.

Research Objective

1. Identifying the level of readiness within mathematic teachers in the implementation of the DLP in the interior schools of Sarawak.

2. Studying the usage level of the English language of mathematic teachers in the DLP classes within the interior schools of Sarawak.
3. Studying the relations between the level of readiness of implementing the DLP and the usage of the English language amongst the mathematic teachers in teaching mathematic in the DLP within the interior schools of Sarawak.

Research Questions

In line with the objectives of this research, the research questions are as follows;

1. What is the level of readiness of mathematic teachers in the implementations of the DLP?
2. What is the usage level of the English language of mathematic teachers within the DLP classes?
3. Are there significant relations to between the level of readiness and the usage level of the English language by mathematic teachers in teaching mathematic in the context of the DLP within the interior schools of Sarawak?

Research Hypothesis

Ho1: There are no significant relations between the level of readiness and the usage level of the English language by the mathematic teachers in teaching mathematics in the context of the DLP within the secondary schools of Sarawak.

Methodology

Basically, this study is conducted using quantitative study construct through the use of study observation approach to identify the level of readiness of mathematic teachers in implementing the DLP and usage level of the English language by teachers during the teaching and learning of mathematics. Population study consists of 100 teachers from the rural areas and 80 teachers was selected as study samples to be used in this study based on the determinations of study sample table. (Krejcie & Morgan, 1970).

The questionnaires were an adaptation from the researches of Shamsudin, Bryan and Nor Aisyah (2022) that monitors the level of readiness of science teachers that implemented the DLP in Petaling Utama. Within the questionnaire, it uses the 5 score Likert scale, where scale 1 refers to *Totally Disagree* and scale 5 refers to *Totally Agree*.

The mean score analysis was acquired and interpreted based on the study adaptation of Pei et al (2018) that stated the score mean range between 1.00 and 2.33 is interpreted as low, score mean range between 2.34 and 3.66 as moderate, and lastly, score mean range between 3.67 and 5.00 is interpreted as high, as shown in table 1. This mean score interpretation is then used to elaborate the questionnaire findings that has been administered to the 80 mathematic teachers that are posted in the interior part of Sarawak.

Table 1

Mean score interpretation in showing the Level of Readiness

Mean score	Mean interpretation
1.0 – 2.33	Low
2.34 – 3.66	Moderate
3.67 – 5.00	high

Source: Pei et al (2018)

Analysis and Research Findings

Level of readiness of teachers implementing DLP

This segment elaborates the analysis of the research findings descriptively based on the aspect of the readiness level of teachers implementing the DLP. Nine items, which is item B1 through B2 were created and were administered to the research samples. Mean analysis, standard deviations, mean interpretations were translated within table 3 below.

Table 2

Level of readiness of teachers implementing DLP (findings in the form of mean)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Data interpretation result
B1 I have sufficient knowledge about DLP	80	3	5	4.43	High
B2 I am searching for information from multiple sources about DLP	80	1	44	4.41	High
B3 I am using DLP teaching sources within my teaching and learning session.	80	2	5	4.16	High
B4					

I am capable of motivating my pupils in using the English language during communing. B5	80	2	5	4.40	High
I am confident that the DLP is capable of improving on their ability in the English language. B6	80	2	5	4.31	High
I view teaching science/mathematic in the English language is easier. B7	80	2	5	4.41	High
I am comfortable in implementing the DLP. B8	80	2	5	4.54	High
I am confident that the DLP can improve on the quality of national education. B9	80	2	5	4.21	High
I am motivated in implementing the DLP in my teaching and learning sessions.	80	2	5	4.17	High
Valid N (listwise)	80				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Level of Readiness	80	2.56	8.33	4.3389	.74039
Valid N (listwise)	80				

Based on the table above, it explains about the analysis of the level of readiness in the teachers using the English language within the DLP classes in terms of the mathematic as the subject in the rural secondary schools of Sarawak. Overall, the research analysis shows that, in total, the mean value is high with a score of 4.3389 and the standard deviation value is .74039, which is interpreted as high in value according to the mean table shown in this study. This finding shows that the secondary school teachers in Sarawak possesses high level of readiness due to them having good knowledge, skills, the command of the English language, as well as the good knowledge acculturation of the language, which helps in the successful implementation of teaching and learning mathematic in the English language.

The usage level of the English language by the mathematic teachers within the DLP classes?

The information below explains the level of the English language usage by mathematic teachers within the DLP classes of the rural secondary schools of Sarawak. This research finding shows the level of readiness of teachers is high as stated by the table below.

Table 3.3

The usage level of the English language by the mathematic teachers within the DLP classes?

Descriptive Statistics

	N	Minimum	Maximum	Mean	Interpretation results
C1 I am well-versed in speaking English within my daily life.	80	3	5	4.45	High
C2 I use the English language fully in my teaching and learning sessions during science/mathematic classes.	80	2	5	4.11	High
I am confident in teaching using the English language.	80	3	5	4.40	High
C3					

I find it difficult to explain the daily examples that is related to topic being taught using the English language.	80	1	5	4.10	High
C4 I can teach science/mathematic in the English language.	80	2	5	3.97	Moderate
C5 I make sure my pupils use the English language during teaching and learning.	80	2	5	4.05	High
C6 I test my pupils' understanding of science/mathematic by using the English language.	80	2	5	4.16	High
C7 I can write my lesson plans well using the English language.	80	2	5	4.44	High
Valid N (listwise)	80				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Usage level	80	2.25	5.00	4.2109	.61835
Valid N (listwise)	80				

Based on the table above, it explains the analysis of the usage level of the English language in the DLP classes during the subject mathematic in the rural secondary schools of Sarawak. Overall, this research analysis shows the mean score is high with an average of 4.2109 and the standard deviation value is .61835, which is interpreted as high based on the mean table shown in this study. This research finding shows that the usage level of the English language in the DLP classes during the subject mathematic is high. This data proves that the knowledge of the teachers is sufficient and are able to carry out their responsibilities in implementing the DLP in their teaching and learning of mathematic within the rural schools of Sarawak.

Research Normality Analysis

The following the research normality analysis, the findings shows that it is not homogenous. Therefore, these data are considered non-parametric and to conduct a corelation analysis, it needs to use the Spearman corelation analysis.

Descriptive

		Statistic	Std. Error	
Readiness	Mean	39.0500	.74500	
	95% Confidence Interval for Mean	Lower Bound	37.5671	
		Upper Bound	40.5329	
	5% Trimmed Mean	39.0556		
	Median	39.0000		
	Variance	44.403		
	Std. Deviation	6.66352		
	Minimum	23.00		
	Maximum	75.00		
	Range	52.00		
	Interquartile Range	7.75		
	Skewness	1.466	.269	
Kurtosis	10.025	.532		
Usage	Mean	33.6875	.55307	
	95% Confidence Interval for Mean	Lower Bound	32.5866	
		Upper Bound	34.7884	
	5% Trimmed Mean	34.0139		
	Median	34.0000		
	Variance	24.471		
	Std. Deviation	4.94679		
	Minimum	18.00		
	Maximum	40.00		
	Range	22.00		
	Interquartile Range	7.00		
	Skewness	-.676	.269	
Kurtosis	.352	.532		

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Readiness	.173	80	.000	.840	80	.000
Usage	.105	80	.030	.938	80	.001

a. Lilliefors Significance Correction

Based on the analysis findings of Shapiro Wilk shows that the distributions are not normal. This is because the significant value for both variables of the teachers' readiness and the use of the DLP are 000 and 001 which is smaller than 0.5. From these, it is interpreted that this is not normally distributed.

This part will answer the 3rd hypothesis.

H03: There are no relations between the level of readiness in implementing the DLP and the usage level of the English language by teachers teaching mathematic in the DLP classes within the rural schools of Sarawak.

Table 3.4: Level of readiness and usage level of the English language by mathematic teachers in the teaching of mathematic in the context of the DLP within the rural schools of Sarawak.

Correlations

			readiness	usage
Spearman's rho	readiness	Correlation Coefficient	1.000	.814**
		Sig. (2-tailed)	.	.000
		N	80	80
	usage	Correlation Coefficient	.814**	1.000
		Sig. (2-tailed)	.000	.
		N	80	80

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

Based on the correlation data analysis of Spearman, it shows that the significant value is 814 which is a lot bigger compared to 0.5. Therefore, it can be interpreted that the data do have a strong connection. In terms of the level and the true significance value of .000 shows that the relations between the two variables are very positive and significant. This shows that the readiness of teachers does not have any relations to the implementations the DLP.

Corelation analysis result shows that the relations between the satisfaction of life and spiritual are a relationship that is positive but weak but the significant of it is ($r = .814$, $K < .05$). This result explains the readiness of teachers is high, so is the implementation of the DLP. This shows that both variables, which is the readiness of teachers and the use of the DLP can be

interpreted as positive, which is significant. Therefore, the hypothesis nol that stated *“There are no relations between the level of readiness in implementing the DLP and the usage level of the English language by teachers teaching mathematic in the DLP classes within the rural schools of Sarawak”* is rejected.

Discussion

This study reviews the readiness of teacher in implementing the DLP, as well as the usage level of the English language within the DLP classes in terms of the mathematic subject within the rural secondary schools of Sarawak. The findings regarding the level of readiness of teachers is high. This shows that there is high level of awareness amongst the rural secondary school teachers in regards to the importance of preparing to execute teaching activities in the context of the DLP within the mathematic subject. This matter can be interpreted as them having knowledge and good experiences because they have high level of readiness.

The second objective refers to the usage level of the English language within the context of the DLP in teaching mathematic of the rural secondary school teachers, which is high. This is because the teachers possess high tendencies to use the English language as an important language medium to confer knowledge within the teaching and learning of mathematic amongst the students.

The third objective is the relations between the level of readiness and the usage level of the DLP in teaching of mathematic and it shows significant relationship between the two. The finding can be interpreted that the teachers who possesses high level of readiness in implementing the DLP can have significant correlations with the good level of implementation of the DLP. Through the finding analysis of the research hypothesis, it can be summarized that if a mathematic teacher possesses high level of readiness, therefore the teacher can improve on their level of implementations of the DLP in teaching of mathematic. This is because the level of readiness needs to make sure that the mathematics teacher has the capacity in carrying out their task in teaching within the context of the DLP. Therefore, the mathematic teachers need to always improve on their level of readiness in terms of the DLP, so that they can successfully implement their teaching activities well.

Suggestion and Post Research

In the effort to improve the effectiveness in teaching and learning within the context of the DLP, professionalism development training for teachers is needed in improving the knowledge and the skills of the teachers in teaching using the DLP within the classroom. Professionalism development training is very important in ensuring the teacher receive training and strategic guidance towards developing more competent group of educators.

Studies regarding the DLP also needs to be given attention in order for more studies to be conducted. This is done in the effort of searching for issues and problems that occurred within today’s educational system and then finds the solutions for those issues and problems that kept on surfacing. The successful result of future researches will be able to become the solution for the problems of the DLP that is happening today for the sake of strengthening the nation’s educational system.

Conclusion

Overall, the research findings shows that the level of the implementations of the DLP in teaching and learning within the rural secondary schools in Sarawak is high. This effort does

not stop here, the researchers and teachers need to be smart and proactive in creating method and strategies in their teaching during class. Every day, the challenge in the educational system is that it continues to face challenges upon challenges. So, with that, teachers need to think of solutions in always improving their knowledge, experience and skills so that they can conduct their teachings more successfully.

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