

## **DUAL LANGUAGE PROGRAMME (DLP): MEDIATING EFFECTS OF READINESS, INTEREST AND CONFIDENCE ON STUDENTS' SATISFACTION**

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### **ABSTRACT**

**Background and Purpose:** Most research on Dual Language Programme (DLP) in Malaysia mainly focused on the teachers' perceptions or challenges faced in implementing the programme in schools and only a few concentrated on the receiver of this programme – the students. Therefore, this study seeks to address this gap by examining factors which affect students' satisfaction of DLP programme.

**Methodology:** In this study, 105 DLP students from secondary schools in Pekan, Pahang, a state in the east coast of peninsular Malaysia, answered a four-point Likert scale questionnaire, ranging from strongly agree to strongly disagree. The questionnaire was first assessed by experts and after that, went through a pilot test. The Cronbach's Alpha value recorded was 0.862. The data obtained were then analysed using Structural Equation Modelling (SEM).

**Findings:** Findings indicate that the path coefficient of readiness to interest, readiness to confidence, and interest to student satisfaction are significant. However, the path coefficient for confidence and readiness to student satisfaction were not significant since  $p\text{-value} > 0.05$ . In testing mediation, interest did mediate the relationship between readiness and student satisfaction with full mediation while confidence did not mediate the relationship between readiness and student satisfaction.

**Contributions:** The contributions of this study lie in its empirical findings in understanding students' satisfaction towards DLP programme in Malaysia. Additionally, it suggests the need for pragmatic and humanistic pedagogy in teaching Science and Mathematics in English.

**Keywords:** Dual language programme (DLP), student satisfaction, Structural Equation Modelling, mediation, Science and Mathematics in English, Malaysia.

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## 1.0 INTRODUCTION

Dual Language Programme (DLP) is one of the initiatives outlined in the Upholding the Bahasa Malaysia and strengthening the English Language (MBMMBI) policy, mooted by the Ministry of Education Malaysia and described in Malaysian Education Blueprint 2013-2025 (Ministry of Education, 2013). In the blueprint, three objectives are prescribed. The first objective is to enable students to have the access and exploration of knowledge in order to compete globally and to increase the marketability of the students in the working field while the second objective is to assist and capture students' enthusiasm of Science, Technology, Engineering and Mathematics (STEM) education in the tertiary level. These first and second objectives are aligned with Shift 1 - to provide equal access to quality education of an international standard – which is listed as one of the eleven shifts in transforming the education system in Malaysia. Consequently, much emphasis has been placed on STEM education in all levels of education to achieve these objectives. The third objective of DLP is to increase students' contact hours with English language, which indirectly enriches their language skills and this is aligned to Shift 2 of the same transformation system that aspires to ensure that every child is proficient in Bahasa Malaysia and English and each child is encouraged to learn an additional language. The DLP programme is offered to schools on voluntary basis, provided the schools fulfill the criteria below (Suliman, Mohd Nor, & Md Yunus, 2017a):

1. Sufficient resource
2. Principal/Headmaster/Teachers' readiness to practise DLP
3. Parental demands and support
4. School's performance in Bahasa Melayu

On closer inspection, the criteria listed mainly revolve around the principal, headmaster, teacher and parents' readiness, demand and support. In fact, after perusing the literature available on DLP, most research on DLP in Malaysia since its inception in 2016 mainly focused on the teachers' perceptions or challenges faced in implementing the programme in schools (Ahmad Sukri & Md Yunus, 2017; Nasri, Md Yunus, & Abdullah, 2018; Has Bullah & Md Yunus, 2019) and only a few concentrated on the receiver of this programme – the students. This begs the following questions: How ready are the students to be fully immersed in DLP, especially with diverse academic backgrounds across the country? Are they interested to learn these STEM subjects in English? Are they confident enough to use the language as a medium of instruction in learning the STEM subjects? Are the students satisfied in learning the STEM subjects in English? How satisfied are the students with the DLP programme? Therefore, this study seeks to address these gaps in DLP research by formulating the following research questions:

1. What is the mediating effect of readiness on student satisfaction?
2. What is the mediating effect of interest on student satisfaction?
3. What is the mediating effect of confidence on student satisfaction?

This paper will first discuss the literature review which are relevant to the research questions. Methodology is then elaborated, and findings will be presented to answer the research questions. Discussion will ensue based on the findings and finally, a conclusion to this paper will outline recommendations for future research.

## **2.0 LITERATURE REVIEW**

This study investigates the relationships among confidence, readiness, interest, enthusiasm, and student satisfaction in learning Science and Mathematics in English. Thus, the following section presents the review of literature that is relevant to the study, particularly learning in the second language, and factors influencing the success of learning Mathematics and Science in English.

### **2.1 Learning in L2**

As the world becomes more globalized, the need to be proficient in English is even greater. Because of this, many non-English speaking countries have started encouraging their citizens to learn English by adopting it into their curriculum. Similarly, English has been a second

language taught as early as in primary school in Malaysia. In addition, English has also been used as the medium of instruction in teaching and learning subjects such as Mathematics and Science for school children. This is implemented through policies such as English for the Teaching of Mathematics and Science (ETeMS) and Dual-Language Programme (DLP) whereby the two subjects are taught in English.

## **2.2 Factors Influencing the Success of DLP and ETeMS**

Learning subjects such as Mathematics and Science in English is a challenging task for many non-native speakers of the language. This is largely due to the fact that the subjects, especially science and technology, are already difficult in themselves. Even when students learn them in their native language (L1), they have found it challenging to understand the concepts clearly. Thus, learning them in a foreign language will make the subjects even more challenging. Consequently, educators have to make learning the subjects fun and interesting for the students in order to ensure their success in the subjects.

Thus far, although there are a number of studies conducted on the issue of learning Mathematics and Science in English, most merely focused on one or two particular aspects at a time. These are either perception of students (Yassin, Marsh, Ong, & Lai, 2009) or readiness, be it teacher readiness (Majid et al., 2011) or even student readiness and confidence (Suliman et al., 2017a). Despite being useful in explaining the issue, the findings from these studies were limited to describing one or two contributions of the students' perception, readiness and confidence as well as teachers' readiness and perception to the learning process.

It is commonly agreed that success in any teaching and learning endeavour involves the interaction of a number of interrelated factors. These factors very often interact with each other to influence the learning process. It is therefore important for a study to investigate the influence of these multiples factors such as readiness, interest, and enthusiasm on the teaching and learning of Science and Mathematics in English. Thus, studies investigating the interplay of various factors contributing to the success of DLP are highly warranted so that appropriate measures can be taken to improve the implementation of the policy itself.

The first important variable affecting learning is readiness. UNICEF (2012) defines readiness as "a product of the interaction between the child and the range of environmental and cultural experiences that maximize the development outcomes for children" (p. 6). Thus, readiness to learn subjects such as Mathematics and Science depends on students' environment which may invoke their willingness to learn these subjects. Gauging student readiness is especially important as success in the learning process is dependent on students' readiness to

learn. In fact, this is stressed by Thorndike (1932), the readiness of students to learn can strongly influence the degree of success achieved. Due to its importance, numerous studies have been conducted to measure readiness to teach and learn Mathematics and Science in English. They include teachers' readiness (Kon, 2008) and student readiness (Haron, Gapor, Masran, Ibrahim, & Nor, 2008; Samsudin & Ismail, 2004; Suliman, Mohd Nor, & Md Yunus, 2017b; Zubir, 2003).

Studies on readiness to teach Mathematics and Science in English have reported mixed findings. As far as teachers are concerned, Kon (2008) found that teacher readiness is reported to be in the range of intermediate to high although the teachers admitted to having insufficient proficiency in the English language, especially in oral skills to enable them to teach in English effectively. These findings, however, contradicted with the survey among student teachers who enrolled in programmes preparing teachers to teach technical subjects at a local university in Malaysia (Misdi, Liew, Lim, Baba, & Tan, 2008) which found that they were not quite ready to teach the subjects in English because of their limited knowledge in English. Similarly, studies conducted on students also indicate that their readiness is affected by several factors particularly language problem (Suliman et al., 2017b), lack of vocabulary (Zubir, 2003), and difficulty in understanding terms (Samsudin & Ismail, 2004).

Therefore, from both parties' perspectives, readiness is to a great extent dependent on language proficiency. The more proficient they are, the more ready they will be. Thus, in order to ensure students and teachers are ready, they have to master the language before learning or teaching the subjects in English. In order to achieve this mastery Idris, Loh, Mohd. Nor, Abdul Razak, and Md. Saad (2006) suggested an intervention programme for both teachers and students to improve their language proficiency and through this intervention, they hoped to improve students' readiness to learn.

The second variable that has been shown to influence learning is enthusiasm. Enthusiasm as defined by Cambridge Online dictionary is "a feeling of energetic interest in a particular subject or activity and an eagerness to be involved in it" and it is an important element in effective teaching and learning. According to Patrick, Hisley, and Kempler (2000), teacher enthusiasm is found to be an effective instructional strategy. In fact, Zhiyong (2016) discusses ways on how teachers can help students to be more enthusiastic in learning. Studies in the area of education found that there is a moderate and positive relationship between teachers' enthusiasm and students' performance, learning attitudes, and interest (Bettencourt, Gillet, Gall, & Hull, 1983). This is simply because teachers who possess high enthusiasm create a positive and engaging learning environment for students to learn.

In the same vein, student enthusiasm is said to bring about the same effects on their learning. This is even more important as enthusiastic students will become more motivated and interested to learn. However, not much has been done to investigate enthusiasm from students' point of view as most are commonly conducted under motivation as the terms are synonymous.

The third variable that is found to affect learning is interest. Interest is one of the most important motivation constructs in education. Interest can generally be defined as an enduring tendency to engage with a particular subject or activity over time (Hidi & Renninger, 2006). It is a powerful tool that teachers can use to encourage engagement in learning (Subramaniam, 2009). Similar to enthusiasm, interest is also related to student performance, and various other positive educational outcomes (Ainley, Hidi, & Berndorff, 2002; Schiefele, 2009).

Confidence is another variable that has a direct impact on the learning process. Studies on the relationship between self-confidence and academic achievement have been conducted in several studies in different disciplines including Mathematics (Hareesol, Mohd Sofian, & Mohamad Khairi, 2017), horticulture science (Shoemaker, 2010) and also language learning (Tunçel, 2015; Nazarova & Umurova, 2016). The findings show that positive relationships between the two variables are noted. This implies that students who are more confident are more likely to perform better academically. In learning a language, Tunçel (2015) investigated confidence level among students enrolling in Turkish as a foreign language (TFL) using two different instruments (a survey and final exam results). The findings show that there is a positive relationship between the two variables (confidence level and academic performance). The higher their self-confidence is, the more successful the students are.

These individual variables are influential in determining one's success in learning. However, the impact of these variables combined may even be greater on students' achievement. For that reason, studies have been conducted involving several variables at a time. One such study was by Suliman et al. (2017b) who conducted a study on lower secondary school students to gauge their readiness and confidence level in learning Science and Mathematics in English. In terms of readiness and confidence level, the findings reported that the students obtained moderate scores. Additionally, the findings indicate no significant difference in confidence and readiness level among students in different classes and gender. However, the study merely describes the level of confidence and readiness of the respondents without investigating the influence of one variable over the other in the learning process.

### **2.3 Challenges and Issues in Learning Mathematics and Science in English**

Previous section discusses factors that are relevant to learning the two subjects in English. This section highlights some issues pertaining to the implementation of the policy. Two commonly reported issues when it comes to learning Science and Mathematics in English are poor command of English and insufficient facilities.

One of the often-highlighted issues is with regard to the poor English proficiency among students and also teachers. For example, Haron et al. (2008) and Kiong, Yong, and Hoe (2005) found that less proficient students who generally came from rural areas suffer the most when it comes to performance in Science and Mathematics examinations due to their inability to understand English well. Poor proficiency in English does not only worry students. In fact, it is also a cause for concern among teachers as not all Science and Mathematics teachers are able to use English well. For this reason, Mohd Sharif (2013) investigated the quality of English by limited English proficiency (LEP) teachers when teaching Mathematics and Science. The data was gathered from three different sources namely lesson plans, classroom observations and interviews. The findings indicate that although the teachers tried very hard to use English during lessons, the language used by the teachers was very simple and the discourse was littered with errors. Consequently, students found it difficult to understand the contents. Likewise, opinions from preservice teachers were also sought by Yahaya et al. (2009). While the preservice teachers felt positive about the move to teach the two subjects in English, they were expressing concern about their ability to effectively teach the subjects in English after considering their own shortcomings in the language.

Apart from poor command of English, another issue that is often associated with this policy is the availability of resources as well as technical support. Although the Ministry of Education provided teachers and students with textbooks and multimedia courseware, teachers still had issues with the resources as they were said to be unsuitable, too brief and lacking in explanation (Yahaya et al., 2009). Thus, teachers were not able to fully utilize these resources to the maximum. Similarly, Has Bullah and Md Yunus (2019) conducted a study investigating teachers' perception on the implementation of this policy. The respondents were teachers from urban schools. Although they were very positive about the move, they also expressed the same concerns regarding limited resources available for use. In fact, problems with facilities are more serious in rural area schools compared to urban schools (Anggau, 2007).

Thus, although the implementation of the policy (teaching and learning Mathematics and Science in English) through two different policies has taken place for more than ten years, it is still very much debated, especially with regards to the effectiveness of the policy, its

implementation, as well as problems associated with its implementation. More needs to be done in order to understand and minimize some of the problems associated with it so that the policy benefits everyone.

### **3.0 METHODOLOGY**

This study uses a survey research design to gather data for analysis. The survey questionnaire was selected as this is a study that sought to ascertain the existing state of the DLP in Malaysia involving four dimensions namely enthusiasm, interest in learning both Mathematics and Science in English, confidence and student satisfaction. The respondents were 105 DLP students from secondary schools in Pekan, Pahang, a state in the east coast of peninsular Malaysia. The questionnaire was adapted from past studies (Gray & Diloreto, 2016). The questionnaire employed a four-point Likert scale ranging from strongly agree to strongly disagree while a neutral stance was eliminated as suggested by Wang, Hempton, Dugan, and Komives (2008). The questions were on enthusiasm (12 items), interest (9 items), confidence (8 items), readiness (10 items) and satisfaction (6 items). Reliability and validity tests were also conducted prior to this study. The questionnaire was assessed by experts and a pilot test was conducted. The Cronbach's Alpha value recorded was 0.862. The data was analysed using Structural Equation Modelling (SEM). The results are described in the following section.

### **4.0 FINDINGS AND DISCUSSION**

This section deals with findings and discussion which correspond with the objectives of the study. Firstly, demographic information of the respondents as well as their results of *Ujian Penilaian Sekolah Rendah* (UPSR) are presented. Then, Structural Equation Modeling (SEM) analyses are interpreted and discussed. Implications of this study are also included in the discussion.

#### **4.1 Demographic Information**

Table 1 shows the demographic information of respondents in this study. Out of 105 respondents, there were more female respondents (56.2 %) than male respondents (43.8%) and the majority of respondents were Form 3 students (50.5%).



Table 1: Demographic information

Variable	Category	Number of Students	Percentage (%)
Gender	Male	46	43.8
	Female	59	56.2
Form	1	25	23.8
	2	27	25.7
	3	53	50.5

Table 2 displays the participants' *Ujian Penilaian Sekolah Rendah* (UPSR) results for six papers (two for Bahasa Melayu, two for English, one for Mathematics and one for Science). Generally, most participants scored well for Bahasa Melayu (Comprehension) paper (75.2%) than English Comprehension (41%). They also scored more As in Mathematics (53.5%) than in Science (26.6%).

Table 2: *Ujian Penilaian Sekolah Rendah* (UPSR) results

Paper	Number of Students and Per Cent			
	A	B	C	D
Bahasa Melayu (Comprehension)	79 (75.2)	24 (22.9)	2 (1.9)	0
Bahasa Melayu (Writing)	69 (65.7)	29 (27.6)	7 (6.7)	0
English (Comprehension)	43 (41)	52 (49.5)	10 (9.5)	0
English (Writing)	29 (27.6)	45 (42.9)	27 (25.7)	4 (3.8)
Mathematics	56 (53.3)	36 (34.3)	10 (9.5)	3 (2.9)
Science	28 (26.7)	68 (64.8)	9 (8.6)	0

#### 4.2 Analyzing Data Using Structural Equation Modeling (SEM)

Respondents' responses to the questionnaire were analyzed using SEM. In conducting this data analysis, several statistical indices need to be considered first. Cronbach Alpha coefficients and composite reliabilities for all constructs were first inspected to assess the internal reliability of all constructs namely student satisfaction, readiness, confidence, interest, enthusiasm (Science) and enthusiasm (Mathematics). A Confirmatory Factor Analysis (CFA) was performed using AMOS 22.0 by maximizing the likelihood estimation to achieve the purpose of this study. The structural model was tested by examining the relationships among the latent variables and detecting the fitness of the proposed models. Thus, Structural Equation Model (SEM) was considered as a suitable method for the current study. Specifically, several model fit statistics were tested, including the ratio of chi-square to the degree of freedom, the root mean square

error of approximation (RMSEA), comparative fit index (CFI) and Tucker Lewis Index (TLI). Moreover, path coefficients were also examined to test each hypothesis.

### 4.3 Findings

A reliability analysis was conducted using Exploratory Factor Analysis (EFA) to check the Cronbach's Alpha values and factor loading for every item. The analysis indicated that the requirement was achieved, whereby all Cronbach's Alpha values for all factors exceeded 0.600. Hence, further tests were performed using Confirmatory Factor Analysis (CFA).

#### 4.3.1 Analyzing the measurement model

Initially, the factorability of the 45 items was examined to gauge the measurement model using single measurement factorability of a correlation. Firstly, it was observed that the factor loading of several items was less than 0.600. Therefore, these items were removed. Secondly, it was also observed that all constructs remained in the model except for enthusiasm construct because the factor loading was less than 0.600. Figure 1 shows the measurement model of the constructs.

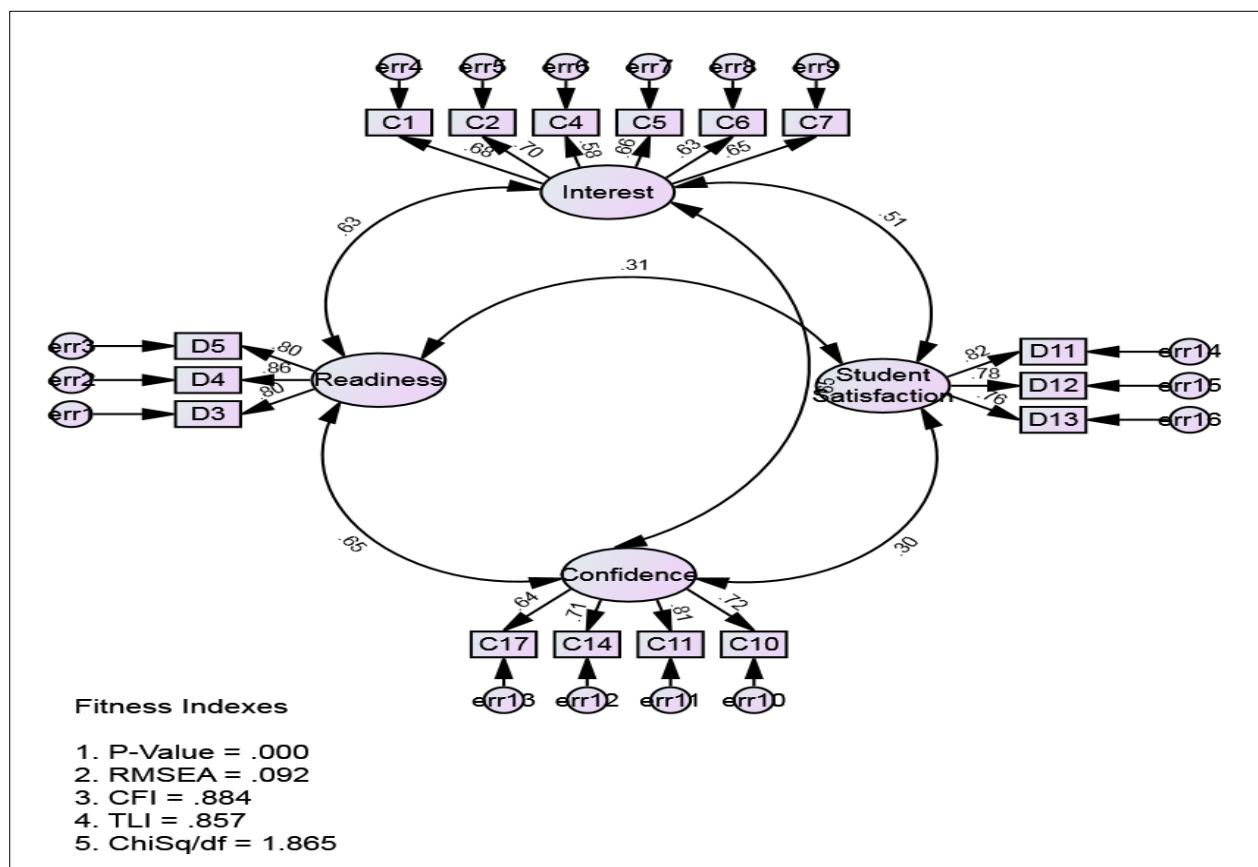


Figure 1: The measurement model for a pooled construct

For the Pooled-CFA, all constructs were combined as shown in Figure 1. The CFA results show fitness indexes and factor loading for every item. The correlation between constructs are computed simultaneously. As shown in Figure 1, certain fitness indexes did not achieve the required level with CFI= 0.884 and TLI= 0.858 were less than 0.900, and RMSEA was greater than 0.08. Hence, modification was necessary to adjust the model. The new measurement model is shown in Figure 2.

#### 4.3.2 Assessing structural model fitness

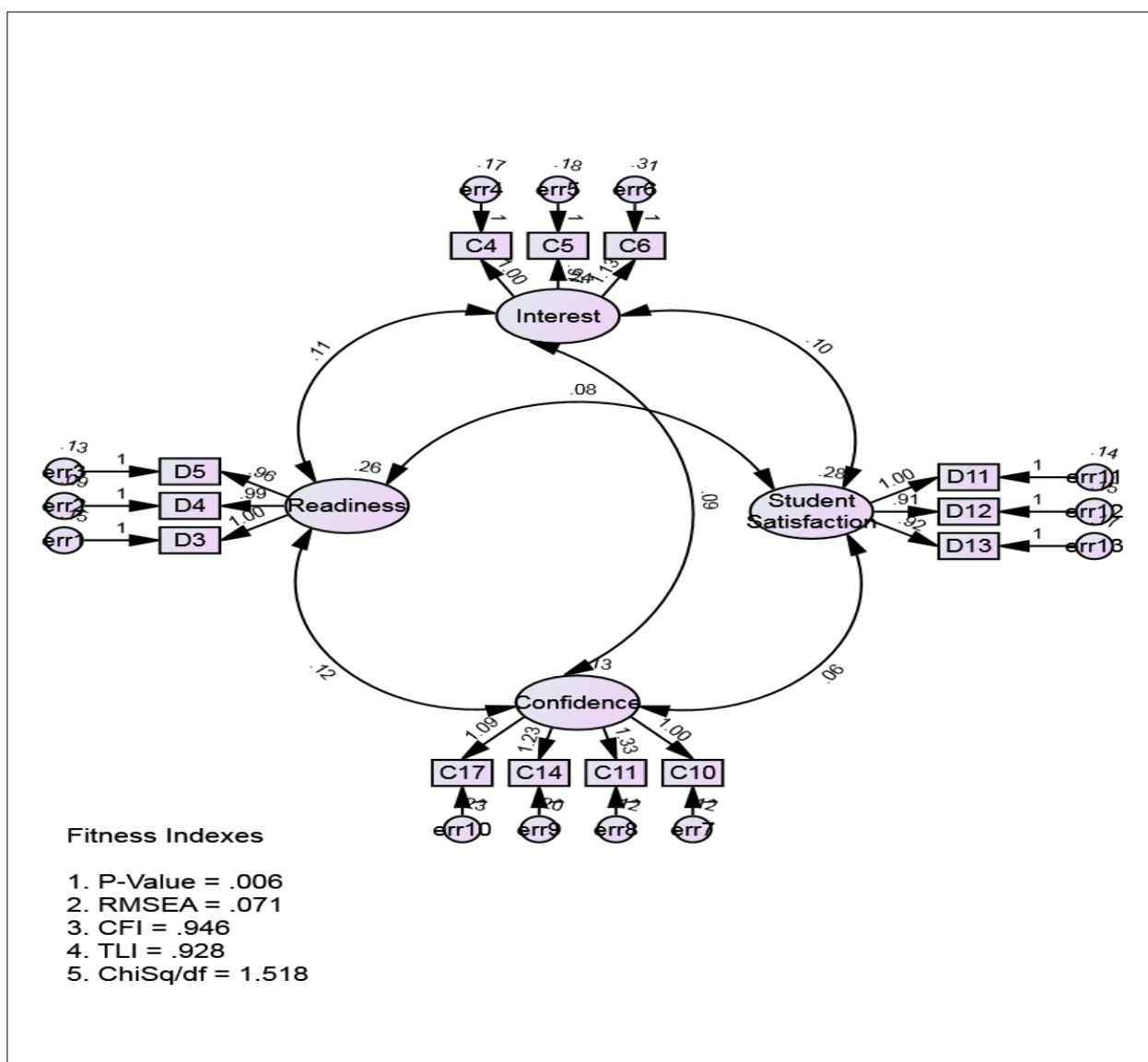


Figure 2: The new measurement model

Figure 2 shows the new measurement model after three items were deleted from the model (C1, C2, C7). Following Awang (2015), the items were removed because the factor loading

was less than 0.6. The process of inaugurating the structural model's validity follows the general guidelines adopted for the measurement model. In addition, the fitness indexes for the new measurement model in Table 3 demonstrates that the CFI and TLI values are 0.946 and 0.928 respectively which fulfilled the requirement for the model. This is based on the cut-off points described in Awang (2015).

Table 3: The fitness indexes for the new measurement model

Name of index	Index value	Indicator
RMSEA	0.071 < 0.08	The required level is achieved
CFI	0.946 > 0.90	The required level is achieved
TLI	0.928 > 0.90	The required level is achieved
ChiSq/df	1.518 < 3.00	The required level is achieved

#### 4.3.3 Assessing the validity and reliability for a measurement model

Table 4 presents the CFA report for every construct in the model while Table 5 shows the discriminant validity index summary for the constructs.

Table 4: The CFA report for every construct in the model

Construct	Item	Factor Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)
Readiness (R)	D3	0.800	0.860	0.673
	D4	0.859		
	D5	0.800		
Interest (I)	C4	0.763	0.782	0.544
	C5	0.743		
	C6	0.706		
Confidence (C)	C10	0.722	0.815	0.527
	C11	0.817		
	C14	0.713		
	C17	0.640		
Student	D11	0.817	0.828	0.617
Satisfaction (S)	D12	0.779		
	D13	0.759		

Composite Reliability (CR) and Average Variance Extracted (AVE) were calculated to determine the reliability of the measurement model. The results from Table 4 shows that the

CR was achieved because all CR values exceeded 0.60. Meanwhile, it is also shown that the AVE values were exceeding 0.50 which indicates the reliability of measurement model in measuring the four constructs.

Discriminant Validity was computed to compare the constructs by observing the value of Square Root of AVE which is known as diagonal values. Table 5 shows that the diagonal values for all constructs are more than the correlation values in its row and column. Therefore, it is justified that the discriminant validity for all constructs is achieved.

Table 5: Discriminant validity index summary

	<b>Readiness</b>	<b>Interest</b>	<b>Confidence</b>	<b>Student Satisfaction</b>
Readiness	<b>0.820</b>			
Interest	0.648	<b>0.738</b>		
Confidence	0.445	0.507	<b>0.726</b>	
Student Satisfaction	0.309	0.303	0.396	<b>0.785</b>

#### ***4.3.4 Analyzing the structural model***

A new SEM estimated covariance matrix was computed and this is shown in Figure 3. The standardized path coefficients between constructs in Figure 3 shows the fitness indexes and factor loading for every item together with the square multiple correlation (R<sup>2</sup>). The value of R<sup>2</sup> for interest, confidence, and student satisfaction are 0.224, 0.443 and 0.173 respectively. Furthermore, the output in Figure 3 indicates that 17.3% of the student satisfaction could be estimated by using three constructs in the model namely interest, confidence and readiness into the model. Meanwhile, 44.3% of the student interest and 22.4% of the student confidence could be measured by using readiness.

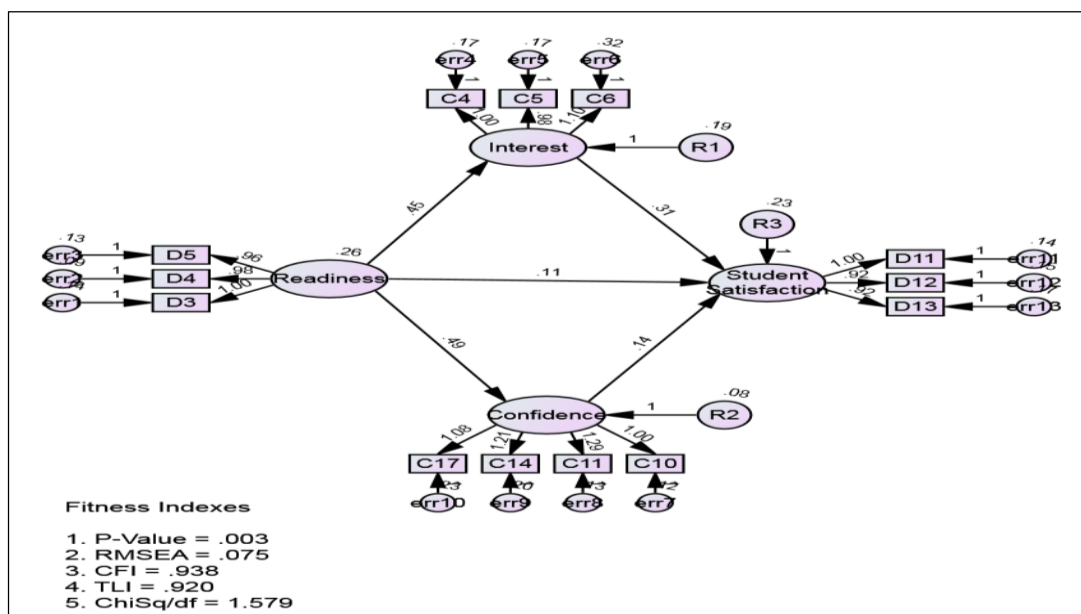


Figure 3: The standardized path coefficients between constructs in the model

At the same time, the fitness indexes as shown in Table 6 fulfilled the requirement.

Table 6: The fitness indexes for the structural model

Name of index	Index value	Indicator
RMSEA	0.075 < 0.08	The required level is achieved
CFI	0.938 > 0.90	The required level is achieved
TLI	0.920 > 0.90	The required level is achieved
ChiSq/df	1.579 < 3.00	The required level is achieved

The fitness indexes in Table 6 show that the CFI and TLI values are 0.938 and 0.920 respectively and these values fulfilled the requirement (it exceeds 0.90).

Table 7 presents the regression path coefficients and its significance based on *p*-value 0.05.

Table 7: Regression path coefficients

Construct	Construct	Estimate	S.E	C.R	P	Result
Interest	← Readiness	0.473	0.117	3.873	0.000	Significant
Confidence	← Readiness	0.666	0.091	5.334	0.000	Significant
Student Satisfaction	← Interest	0.294	0.150	2.092	0.036	Significant
Student Satisfaction	← Confidence	0.100	0.235	0.599	0.549	Not significant
Student Satisfaction	← Readiness	0.111	0.186	0.612	0.541	Not significant

S.E = Standard Error; C.R =Critical Ratio

Based on Table 7, the result shows that the path coefficient of readiness to interest, readiness to confidence, and interest to student satisfaction are significant with 0.473, 0.666, 0.294, respectively. It indicates that the hypotheses for all three paths are supported since p-value <0.05. However, the path coefficient for confidence and readiness to student satisfaction is not significant since p-value > 0.05. Accordingly, this implies that confidence and readiness had no significant effect on student satisfaction.

These results may also suggest that respondents in this study might possess limited readiness in learning Science and Mathematics in English and these results concur with findings on readiness. Studies found that readiness was affected by several factors particularly language problem (Suliman et al., 2017b), lack of vocabulary (Zubir, 2003), and difficulty in understanding terms (Samsudin & Ismail, 2004). Looking at respondents' UPSR results, we found that only 41% scored A for their English Comprehension and this could have contributed to their readiness.

#### 4.3.5 Analyzing the mediating variables

Based on the final model shown in Figure 3, there are two mediator variables in the model which are interest and confidence. Table 8 and Table 9 present the results for both mediators.

The main hypothesis for the mediator of interest is *interest mediates the relationship between readiness and student satisfaction*. Table 8 shows the results of the test.

Table 8: Testing interest as a mediator in the relationship between readiness and student satisfaction

Relationship	Estimate	P-value	Result
Readiness → Interest (a)	0.473	0.000	Significant
Interest → Student Satisfaction (b)	0.294	0.036	Significant
Readiness → Student Satisfaction (c)	0.111	0.541	Not Significant
a*b	0.139	Full mediation since direct effect	
a*b > c	Mediation occurs	(c) is not significant	

Based on the results in Table 8, it is evident that readiness had a significant effect on interest (a) at  $p=0.000$  and interest had a significant effect on student satisfaction (b) at  $p=0.036$ . Furthermore, the value of  $a*b$  is greater than  $c$ , hence, the mediation test is supported and, it can be concluded that interest does mediate the relationship between readiness and student satisfaction. Thus, the type of mediation is Full Mediation since the direct effect is not significant. These results support studies on interest whereby it relates to student performance and various other positive educational outcomes (Ainley et al., 2002; Schiefele, 2009). It suggests that respondents in this study were interested to learn Science and Mathematics in English.

The following results show the testing of confidence as a mediator in the relationship between readiness and student satisfaction. The main hypothesis for the mediator of confidence is confidence mediates the relationship between readiness and student satisfaction. The results for this hypothesis are displayed in Table 9.

Table 9: Testing confidence as a mediator in the relationship between readiness and student satisfaction

Relationship	Estimate	P-value	Result
Readiness → Confidence (a)	0.666	0.000	Significant
Confidence → Student Satisfaction (b)	0.100	0.549	Not Significant
Readiness → Student Satisfaction (c)	0.111	0.541	Not Significant
a*b	0.066		
a*b > c	Mediation does not occur	No mediation	

The results show that readiness has a significant effect on confidence (a) at  $p=0.000$ . However, confidence has no significant effect on student satisfaction (b) at  $p=0.100$ . Moreover, the value



of  $a*b$  is less than  $c$ , therefore, the mediation test is not supported and, it can be determined that confidence does not mediate the relationship between readiness and student satisfaction while the type of mediation is no mediation since the direct effect is not significant and indirect effect < direct effect. These results confirm some of the findings on the relationship between confidence and academic performance. Results of this study suggest that respondents of this study were not confident enough to learn Science and Mathematics in English.

## 5.0 CONCLUSION

DLP in Malaysia is still in its infancy and thus, further research is needed in understanding the multi-facet factors which contribute to student satisfaction in learning Mathematics and Science in English. Findings from this study indicate that students' readiness in learning these two subjects in English had a significant effect on interest, and interest had a significant effect on student satisfaction (full mediation). Despite readiness having a significant effect on confidence, confidence has no significant effect on student satisfaction (no mediation). Therefore, in order to improve DLP in Malaysia, students' confidence in learning these subjects in English needs to be improved in order to produce desirable outcomes.

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