

# The Mathematics Performance of Primary School Students' in Southern Thailand

Hareesol Khun-Inkeeree, Mohd Sofian Omar-Fauzee,  
Mohamad Khairi Haji Othman

HareesolKhun-inkeeree:AwangHadSalleh,GraduateSchoolofArtandScience,Universiti Utara  
Malaysia

Email: sol.khun75@gmail.com

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## Abstract

The investigation on performance between public and primary school pupils in southern Thailand is still unjustifiable due to lack of research and interest among scholars and researchers. Although the efforts by Thai government to increase the performance level of public school students had increased through budget allocation, however it is yet to be justifiable. Thus, this study examines the difference in performance between private and public schools in Thailand. A total of 100 students from both government and private primary school were examined. The result from the analysis posited that private schools perform better than public schools. An ANOVA is used to compare the difference between two public schools and one private school, where private school shows better performance, as compared to public school. However, the lower income family in public school scored higher than higher income family. The limitations and recommendations were also discussed in this paper.

**Keywords:** Mathematic Performance, Public and Private Primary School, Southern Thailand and Education Performance

## Introduction

Globally, the sound educational system is rooted in the educational structure, adequate planning and effective implementation system for social and economic development of any country (Edet, 2015). In other words, education has great impacts on individual and social behaviour, besides being the foundation of economic development in building a wealthy nation (Garriga & Mele, 2013). According to Khan, Fauzee and Daud (2015) the success of a nation depends on the quality of education system where it contribute major roles in developing outstanding society at large. On the other hand, education generally helps to facilitate human development in order to improve health, gender equality, strengthened social cohesion, mitigating inequity and the reduction of poverty (Oldekop et al., 2016). Moreover, through education multiple dimensions of societal development such as social, cultural, environmental and economic can be addressed. Furthermore, World Bank identified that through good education a child breed into a good parent, becomes an informed decision maker, adapt to the changing technologies, handle crisis, a better standard of living and become a responsible citizen (Klees et

al., 2012). In relation to that, Krishnaratne, White, and Carpenter (2013) mentioned that both United Nations (UN) Convention on the Rights of a Child and Universal Declaration of Human Rights defined education as a “fundamental human right”. The Millennium Development Goals (2015) firmly state that education is the answer to poverty. With these masterpiece of achievement by the year 2015, that are (i) Achieve universal primary education for all boys and girls, and (ii) Eliminate gender disparities in education. Moreover, education is argued to be among the principal component in human capital formation. Quality human resources depend upon the quality of education of a country. Sustainable economic development requires skilled manpower which is raised through productivity and efficiency of individuals that is only possible through education (Nasir & Nazli, 2010).

The world education has become more and more competitive now. The global education system revolves around students' performance. Parents desire for high level of performance of their children in education. These desires put a pressure on both Government and Private schools and make them competitive in terms of performance which is relative to mathematics as a subject, being key to all other subjects and is made compulsory in all schools (Khonkarn, 2006). On the other hand, The Thailand Government spending on education shows a sharp increase since 2003. This is true, because in 2003 the government allocated only 1.4 trillion baht; however, in 2009 it was 3.5 trillion baht; it reached nearly 4.6 trillion baht in 2012. The education budget allocation constitutes 4% of GDP, while in Singapore it's only 3% of GDP. This huge budget is meant for the build of better educational infrastructure, re-vamp the curriculum, trained teachers, pay adequate remuneration to teachers and promote importance of learning among the student population (Tangkitvanich, 2013). Despite this, the Thai education system is not performing as expected in performance in PISA result as compare to other countries, which diminishes Thailand's competitiveness in the world and perhaps, will put the country's future at risk. Despite the importance of educating people, there is still lacking of proper enforcement to make it a zero defect in the school setting. Therefore, this quality education system needs more systematic research in order to fulfill the National objectives in educating people.

### **Mathematics Performances**

Mathematics as a subject is one of the major requirements that a student needs to achieve a better grade performance. Several studies have been carried out comparing the performances of students in public schools and their counterpart in private schools and this has yielded inconclusive arguments. For example, the study of National Assessment of Educational Progress (NAEP) which is a representative at national level for the assessment of American's students' knowledge in several subject areas, reports that Private schools performed better than Government schools in all major subject areas including mathematics and sciences (U.S. Department of Education 2012). Moreover, another study of the analysis of American students' performance in mathematics, stress that Private schools outperformed in the majority of cases, while Government schools performed well after accounting for the facts (Lubienski, 2006, Peterson and Llaudet, 2006). But National Centre for Education Statistics (NCES) published a study containing surprising facts that Government schools students are excelling on a comparison to Private school students by analyzing the data NAEP 2003 in mathematics. In order to have an understanding of the system of education in Thailand there is need to know the structure and how it works.

The Thai Education system lays tremendous emphasis on Mathematics as the basis for overall learning development. The learning of Mathematics imparts many skills that contribute to the

development of the human mind. It trains the learner to think methodically and rationally, analyze various types of situations, anticipate and plan, make decisions and solve problems. Mathematics also serves as a tool that facilitates the gaining of knowledge related to science and technology. Mathematical skills and knowledge are indeed essential to enhance the standard and quality of living in the modern era. There are three levels of Mathematic Curriculum in school (Inprasitha, 2004; Khonkarn, 2006; Kilpatrick, 1993): i) Intended curriculum which is derived from the school administrators' Perspectives; ii) Implemented curriculum which is derived from the teachers' perspectives, and iii) Attained or realized curriculum which is derived from the students' perspectives

The learning areas in the study of mathematics are designed to enable students to acquire mathematical skills and knowledge to their utmost potential. These include numerical concepts and sense of perception; percentage and ratio; and system, properties, and operation and application of real numbers. It was realized that mathematics curriculum cannot really be found in textbooks, reports, or documents. It occurs and continues in the classroom which is the structural unit of Mathematics (Inprasitha, 2004; Khonkarn, 2006). The guidelines of National Council of Teachers of Mathematics (2000) suggest that teachers should establish the standard for class discussion. The groundwork for Mathematics learning is that students should be good listeners who respect and value others' opinions whether or not they are agreeable. Perhaps, being a good listener is not only valuable guidelines, but, it should be integrated with corporate learning strategies as well as other strategies of learning (Zepke, 2015).

The responsibility to ensure this in the classroom was also given to the teachers. Goh and Fraser (1995) studied 1,512 elementary students from the public schools in Singapore on the learning environment and student outcomes in primary mathematics. They found that, "as the behavior of both teacher and student influence each other mutually, teacher-student interactional behavior is assumed to be of crucial importance to student learning in the classroom" (Fraser, 1995 p.2) Recognizing the importance of Mathematics learning as outlined above, the Ministry of Education of Thailand (2001; 2008) stated that students in Thailand were expected to learn to associate knowledge of Mathematics with other sciences.

### **Public and Private School Issues**

Over the years there have been series of investigation to determine the difference in performance among students in public (government) and private funded schools and this of course had yielded mix findings. Some scholars devised that there is no statistical difference in terms of students' performance however, some characteristics such as teaching method, was said to differs (Al-Duwaila, 2012). Whereas Lubienski and Lubienski, (2013) after investigating public and private school in the US they posit that students from public schools has better performance compared to those in private schools in mathematics as a course. Contrary to the above argument, Dronkers and Robert (2003) argued in favor of private schools over government sponsored schools claiming that the school climate; learning conditions as well as parent social compositions are factors responsible for this. Similar to this, the study of Braun, Jenkins and Grigg (2006) deduced similar conclusion positing that students from private school has higher performance compared to their counterpart at public schools. Supportive conclusion as well is seen in the study of Olasehinde and John (2014) after comparing secondary schools in Nigeria. The author reported that students in private schools out perform their counterpart in public funded schools. The supportive arguments for the above claim is found in the study of Berkeley Parent Network (2009) claiming that the

involvement of parent who bear the expensive cost of education to suit family status influence the performances of private school over that of public schools. Therefore, this study aims to determine the level of student performance in mathematics between Government and Private primary Schools in developing countries especially Thailand. In view of this, the study also tends to examine whether family income do contribute to students' performance in mathematics.

### **Research Methodology Sampling**

This study is a comparative study aimed at investigating the performance of students studying mathematics in government and private school. A sample of 100 students were selected from three different schools (Public school 1=16; Public school 2=34, and Private school=50) in Sadao district, Songkhla province, Southern Thailand. The three schools were selected based on evidence of availability of different factors (difference family income, present of public and private primary school in the same geographical area) that were concluded to be among the factors responsible for difference in performance between public and private school pupils. The respondents were selected randomly from each school for the survey.

### **Instrumentation**

The School Based Test on Achievement adopted from Songkhla Primary Education Service. The 60-items were highlighted the mathematics knowledge of 6<sup>th</sup> grade students in topics: area/perimeter, geometry, algebra, graphing, data management and probability. Sixty items in both tests were instructed by applying Bloom's cognitive domains of taxonomy. As the result, the tests consist of 10 items of the factual information recall; 10 items of the lowest level of comprehension; 10 items of complex level of application; 10 items of analysis; and the last 10 items of synthesis. Each item is counted for a score of one; therefore, the total score is 60. The items are formatted in the multiple-choice pattern. There are four choices in an individual item. Cronbach for this test were found to be .78, .805; .803, and .831 for the variables self- confidence, value, enjoyment and motivation respectively which are suitable reliabilities in any research observations (Afari, 2013).

### **Procedure**

The researcher had asked the provision from all the three schools to participate in the study. As appointed, the first author had gone to the school to deliver the questions to the randomly selected students at their vicinity. However, before the test, the students were briefly explained about the reason for the study and they were informed that those who don't want to participate for any reasons were free to opt out at any time. The mathematics test took them about forty (40) minutes to finish.

### **Data Analysis**

To fulfil the objectives of this study, as well as affirming the objective, as per, investigating if there is difference in mean performance between students in public and private schools in Southern Thailand at the three schools it is necessary to analyze the data using the independent t-test and ANOVA statistical tools.

### **Result**

#### **Demographic Data**

From the analyzed data using frequency analysis, it was observed that the samples from the three schools have the same percentages 50% male and female respondents i.e. 50 male and 50 female students. Also, the result shows that the average family incomes of pupils from public school 1

and Public school 2 schools which are public are lesser than that of the private school i.e. Private school. This is presented in the table 1.1 below.

Table 1.1

*Descriptive statistics table presenting data characteristics*

Variable	Frequency	% Freq
<b>Gender Male</b>	100	100%
	50	50
<b>Female</b>	50	50
<b>Age</b>		
<b>11 years</b>	42	42%
<b>12 years</b>	58	58%
<b>Average Family Income (Thai Bath)</b>		
<b>Public School 1</b>	10,000 – 15,000	
<b>Public School 2</b>	10,000 – 15,000	
<b>Private School</b>	17,000 >	

### The Private and Public School Students Mathematic Performance

From the data gathered from the use of survey questionnaire independent sample T- test was utilized to analyzed the data so as to investigate if there is difference in mean students' performance among genders and also, between public and private schools. The Table 1.2 below presents the result of the analysis. The readings from the mean as well as standard deviation show that there is difference between the performance of both public and private school students. It is presented that private schools pupils have higher mean showing that they perform better. This result conforms to the most previous finding (Dronkers & Robert, 2003; Grigg, 2006; Olasehinde & John, 2014). Further readings from the t-test analysis present that these differences are statically significant. The independent T-test analysis present that there is significant difference in performance of students from public and private schools. Having  $t(-3.04) = 98, p = .003$ . With these findings, the first hypothesized assumption in this study failed to be rejected.

Table 1.2

*Independent Sample T-test table comparing students' performance between Government and Private Schools*

	Independent			Samples	Test	
	n	Mean	Std. Deviation	df	t	P
<b>Public</b>	50	23.80	6.091	-3.04	98	.003
<b>Private</b>	50	28.02	7.692			

$p = .005$

### The Comparison based on Family Income of Private and Public School

To ascertain the significant different among the three schools chosen for this study that is, public school 1, public school 2 which are government sponsored schools and a private school. One-way ANOVA was conducted to investigate the null hypothesis ( $H_0$ ) that there is no difference in performance of students in the three schools surveyed status ( $N=100$ ). The independent variables; public school 1 ( $M = 25.25$ ,  $SD = 5.520$ ,  $n = 16$ ); public school 2 ( $M = 23.12$ ,  $SD = 6.304$ ,  $n = 34$ ) and private school ( $M = 28.08$ ,  $SD = 7.692$ ,  $n = 50$ ). This result is presented in Table 1.3 and Table 1.4 below:

The ANOVA test was found to be significant with,  $F(2,97) = .850$ ,  $p = .008$ , Cohen's effect size ( $\eta^2$ ) = .095. Hence, it is concluded that there is a significant evidence not to accept the null hypothesis and remarks that there is difference in students' performance among the three schools examined.

Table 1.4

*ANOVA Table comparing the mean of*

School	N	Mean	SD	F	Sig.
Public school 1	16	25.25	5.520	5.140	.008***
Public school 2	34	23.12	6.304		
Private school	50	28.08	7.692		

\* $p = .05$ ; \*\* $p = .01$ ; \*\*\* $p = .001$

Table 1.5

*Post HOC Multiple Comparison Test*

(I) Schools	(J) Schools	Mean (I-J)	Standard Error	Sig
Public school 1	Public school	22.132	2.103	.570
	Private school	-2.770	1.992	.350
Public school 2	Public school	1-2.132	2.103	.570
	Private school	-4.902*	1.542	.006
Private school	Public school 1	2.770	1.992	.350
	Public school 2	4.902*	1.542	.006

### Discussions

Results show that there is significant difference between the performances of public (government) and private students conforming previous studies (Dronkers & Robert, 2003; Grigg, 2006; Olasehinde & John, 2014). The result from the analysis presents that private schools has better performance as compared to public schools in Southern Thailand. These results may be attributed to characteristics such as small number of students in each classrooms at private schools, availabilities of teaching facilities such as computer laboratory, projectors, learning tools, ceiling fan and also air conditioners and average family income of students enrolled in private schools. These factors might not be available in public schools due to large numbers of pupils attending public primary schools compared to private primary schools in Thailand. Furthermore, facilities such as LCD projector, visual and virtual teaching aids are as well available in private schools in Thailand because students from wealthy families attend these schools. This according to (Suryadarma et al., 2006; Tucker, 2013) technological aid improves students' performance.



The wealthiness of parents of students enrolled in public and private schools, perhaps may give impact on primary school performance. Previous studies observed that parents of students in private schools pay higher than their counterpart in public schools therefore, they demand for higher quality services than those rendered in public schools in return, private students tends to perform higher than students enrolled in public primary schools (Feldstein, 1975; Shleifer, 1998). Perhaps, the qualitative intervention should be conducted among the private school students and teachers in order to understand the distinguish reason that their performance better. Is it because of the facilities or the attitude of teaching and learning among teachers and students?

The private school teachers teaches using the aforementioned facilities which makes teaching process to be convenient compared to public schools where the only ventilation available is classroom windows. Although it is noted that Thai government spends more money that accumulates to a total of 4% GDP on education far more than amount spent in Singaporean education Tangkitvanich (2013) with expectation of huge positive result. However the high amount of money spent by Thai government to improve students' performance in government schools does not reflect on the students' performance as latest technologies needed to improved students' performance were not available. Moreover, it is interesting findings that the public school 2 which socio-economy of the parents were lower than the public school 1 showed better results in mathematics. According to the study of Hernandez (2014), it was acclaimed that socioeconomic status does have high correlation with performance in mathematics after investigating public middle school pupils in Florida in the USA. However, Ozturk and Singh (2006) conclude that there is no direct relationship between socio economic status and students' performances in mathematics.

Perhaps, this shows that the attitude of the student at lower income family had been given motivation and encouragement by their parent to do well in their study. Further study need to be conducted to understand the scenario behind the family income and student achievement in mathematics.

### **Limitation**

The main issue faced in this study is that more schools could not be surveyed because of logistics limitations. Therefore, limiting the numbers of schools surveyed to just three (3) schools in Southern Thailand. Another study should focus on more schools in order to generalize the findings.

### **Suggestion and Future Investigation**

It could be suggested that since more money is spent on education and little or less is achieved in terms of performances of students compared to other countries such as Singapore where less than 4% of total GDP are spent. In this case, there is need to set up a supervisory committee to oversee the education allocation for public schools. Thus, the researcher obliges future studies to examine the relationship public school budget expenditure and students performance. Furthermore, a qualitative research and perhaps, the experimental study over a period of time should be conducted to get a better picture of the situation in public and private school. Perhaps, a new interaction of corporative learning in mathematics should be introduced to primary schools probably in southern Thailand.

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### Corresponding Author

Mohd Sofian Omar-Fauzee

School of education and modern language, Universiti Utara Malaysia, College of Arts and Sciences, Sintok Malaysia.

Email: mohdsofian@uum.edu.my

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