EE409: Seminar in Political Economics and Economic History

Does the Teach for Thailand Program Improve Student Achievement?

Presents

Ph.D. Thorn Pitidol

By

Parimaporn Sumdaengrit

5704641504

Semester 2/2017

Faculty of Economics, Thammasat University

Does the Teach for Thailand program improve student achievement?

Abstract

This research aims to analyze whether "Teach for Thailand" (TFT) teachers has improved the student academic achievement. TFT emerged from the recognition that educational inequality remains an important problem, especially for Thailand. TFT seeks to bridge the gap in Thailand's educational inequality caused by the inabilities of schools in low-income areas to hire and retain high quality teacher. TFT provides the solution by creating a pool of potential teachers recruited from the nation's top universities with diverse academic backgrounds and strong leadership capacities, and assigning them to teach in these schools with two years commitment.

The analysis of the impact of TFT was based on pre-test and post-test scores in Math, Science and English of those lower secondary students taught by TFT teachers in the second semester, academic year 2017. The tests were controlled and conducted by TFT headquarter. Descriptive statistics and stepwise multiple regression were utilized to explain the students' academic growth and the factors that influence it.

The findings showed that out of 2,826 students taught by TFT teachers, 2,054 students performed relatively better or equal to that at the beginning of the semester. Within these well performing students, the largest group was G.8 student, accounting for 38.2 percent, followed by G.7 and G.9 students, respectively. Mean score of post-test was higher than that of pre-test with 6.5 score difference, reflecting overall improvement in students' performance after being taught by TFT teachers. Designating the growth of the students' performance as dependent variable, the results can be to show that TFT teachers contributed highest positive impacts in English and, not as high but positive in Math. Their effectiveness was addressed to be stronger on worse performing students than those well performing, reducing the difference between students' ability to learn. Further analysis also showed that one additional year of experience of TFT teachers actually produced negative impact; meaning that less experienced TFT teachers performed better than those with more experienced. This astonishing result could be the outcome from the improvement in recruiting and training structures of TFT over the year.

These findings provide support for the potential value of TFT teachers to Thai society, and ensure that over the long-run, the positive impact will likely be stronger, contributing these disadvantaged students higher opportunities in life and reducing the gap of educational inequality.

I. Introduction

Whether or not the alternative teacher training and placement program like the "Teach for Thailand" (TFT) improved student achievement was debatable since although these teachers were the best at what they studied, it did not mean that they would also be the best at teaching others. According to available researches which had only been done on the original program, Teach for America (TFA), TFA teachers were found to actually improve student achievement. Thus, the aim of this research is to present that TFT teachers did improved student achievement, and could potentially reduce educational inequality gap in Thailand further on. The analysis was based on pre-test and post-test scores in Math, Science and English of those lower secondary students taught by TFT teachers in the second semester, academic year 2017. Descriptive statistics and stepwise multiple regression were utilized to explain the students' academic growth and the factors that influence it.

Education is the most important determinant of social disparity since it is the tool in human capital development which impacts further on overall development of the society (Sangmahamad, 2017). Of course, with the support from the nation's government and related organizations around the world nowadays, every child is able to access to education. Nevertheless, equal accessibility to education does not guarantee equal opportunity in life since the quality of education is being poorly controlled because the schools in disadvantaged, low-income society usually has trouble hiring or retaining high quality teacher, unlike those in advantaged, high-income society (Kopp, 2001). Despite having high ability to learn, these disadvantaged children will be restrained from having equal chance in life because of one factor, "Educational Inequality" that keeps on widening.

In order to serve the neediest schools with high quality teacher who willing to commit in teaching in these schools, TFA was initiated and moving straight toward solving the challenges by recruiting outstanding graduates from nation's top universities and assigning them to disadvantaged, under-resourced schools with two-year commitment. With only five to eight weeks of training, it is questionable whether the program is going to improve or worsen the matter. However, many recent researches were able to provide the world with better coverage and less bias analyses which indicated positive effect of TFA teachers (Glazerman, Mayer, & Decker, 2006; Raymond, Fletcher, & Luque, 2001; U.S. Department of Education, 2013; Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005; Laczko-Kerr & Berliner, 2002).

TFT was initiated to serve the Thai society for the same reason, to reduce educational inequality, through adopting the same practice as TFA. This research analyzed whether TFT teachers improved the student academic achievement. The next section mainly discussed about TFT program background and its potential value to the Thai society. In section III, literatures were reviewed to emphasize the important of teacher as an educational input, and to observe the way TFA was evaluated so that further the conclusion could be constructed from those findings. Section IV applied the basis of Economic of Education to construct the function for this analysis in which each variable was based on the availability of data, and was discussed in detail individually. After the function was constructed, in section V, the way in which the analysis being done was explained, together with the acquired data. Section VI showed all the analyses both in descriptive statistics and multiple regression. Section VII and VIII are discussion and conclusion, respectively.

II. “Teach for Thailand” Program Background

Long before Teach for Thailand (TFT) was initiated, there was first the program called “Teach for America” (TFA), established by Wendy Kopp in 1989, with the mission to ensure that all children have an equal opportunity in life through the nation’s strong collective young leaders recruited from the nation’s top universities. These individuals are not only outstanding in their academic backgrounds, but they are also holding leadership capabilities since Kopp believes that for a teacher to be effectively provides the teaching, one must know the subject matter and be able to lead the students (Kopp, 2001).

Since these recruited participants have diverse academic backgrounds which mostly are not associated with education, five to eight weeks training is provided along with any other supports each participant needs to ensure that the students will improve the most within the two-year commitment. The training structure is different from the conventional route as in-service training and interaction with other teachers are highly valued so that the recruited participants will be able to discuss challenges and ideas with colleagues and older teachers (Raymond, Fletcher, & Luque, 2001).

The participants are assigned to the schools in disadvantaged, low-income areas where the inability to hire and retain high quality teacher are the major challenges which widening the gap of educational inequality between the students from advantaged and disadvantaged schools. Thus, by assigning the recruited participants as normal new teachers in those schools will benefit students in term of learning, and overall society as the participants are expected to gain insight and utilize it further through continuing educational related works in teaching or other sectors (Kopp, 2001). Later, “Teach for All” was initiated in 2007 in order to spread the core purpose, approach and commitment of Teach for America all over the world through a global network of independent, locally led organizations which currently consisted of 48 countries on six continents (Teach for All, 2018).

“Teach for Thailand”, one of the network partner, has been following the same structure of recruiting and operating since 2012. The program is aiming for short-term goal of reducing the gap of educational inequality, and long-term goal of creating the group of collective alumni who truly understand the challenges in Thai education and have the capability to make some impacts continuously to the nation further on (Teach for Thailand, 2014).

The training for TFT teachers is conducted with some adaptations from Teach for All curriculums to meet the Thai context, along with the support from Faculty of Education, Chulalongkorn University. Currently teaching in six provinces, TFT teachers not only strive for progress on student academic achievement, but they also concern on student attitude and motivation toward one’s future self and the society in which one lives.

However, TFT was being questioned from the start about teaching capacity of these top universities’ newly graduates since although they are the best in their fields of study, it does not mean that they are going to be the best in teaching. TFT recently has a huge controversial on social media that the teacher from the program who highly aims the best for students and tries hard to contribute some impacts was being restrained from his good-intention intervention of any kind by that school’s conservative teachers. Moreover, many conventional route teachers strongly oppose the teachers from TFT, addressing that those TFT teachers stealing their belonging job, trying to make some unnecessary changes, and receiving higher wages without having to spend five years in education-related field to be qualified for teaching license examination (Pantip, 2016).

Ironically, Thailand is suffering from shortage of high quality teacher since 90 percent of Thai citizens aged between 18 to 20 years old do not prefer being a teacher (Teach for Thailand, 2014). The problem is accompanied with the greater requirement on a formal licensing, which requires an educational qualification accredited by the Teachers' Council of Thailand and a minimum of one year of in-service training. One has to obtain a five-year Bachelor of Education degree in order to be qualified for teaching license examination. Within that five-year course, there are four years of coursework and a year of in-service training at schools. Those who wish to obtain teaching license, regardless of their academic backgrounds, will have to spend an extra year of in-service training, and taking a number of pedagogical courses and a final examination (The Teachers and Educational Personnel Council Act B.E. 2546, 2003).

Educational inequalities in Thailand are addressed through 3.8 years difference of reading skill between students in advantaged schools and those in disadvantaged schools, and five times income differences between those who graduate bachelor degree and those who stop attending school after primary level (Teach for Thailand, 2014). As a result, these young people in the disadvantaged group will be involved in low-skill jobs contributing low productivity for economic growth. Because education is the main mechanism in the development of human capital and innovative capacity (Hanushek & Wößmann, 2007), the effectiveness, equity and efficiency of Thai education system needs to be enhanced so that all students will be able to reach their highest potentials and contribute them back to the society (OECD/UNESCO, 2016).

The impact of TFT teachers is not only limited to individual student level, but it also expands to school and society levels (Teach for Thailand, 2014). TFT believes that, with proper training, TFT teachers can contribute not only to student learning, but also to the school in term of better teaching strategy. Improving student performance is definitely a goal, but for long-term benefit, students need to change their perception toward education, and not to limit themselves only to what society tells them to be. One of the success examples of TFT teacher initiated activity, "Saturday School", was first an activity that allows those individuals who have tight schedule but want to contribute something to the society, and own distinctive skills, other than academic knowledge, to come to the school on Saturday teaching students on those particular fields they specialized. Later on, after his two-year TFT commitment, this TFT alumni decided to augment this small activity into a success organization in 2014, accessing and inspiring over 1,378 students. The activity aims to increase community engagement, and for students to explore new activities that allow them to unlock their full potential on what they are really interested in (Saturday School, 2017; Teach for Thailand, 2018).

Of course, more success stories are expected in the future to come from TFT alumni, however, until now there is no research or any tangible evidence proving the short-term effectiveness of TFT teachers on students' learning since these TFT teachers are expected to be a potential source of high quality teacher who able to be the valuable supply for socio-economically disadvantaged schools, and achieve the goal of reducing the educational inequality gap in Thailand.

III. Literature Review

In this section, those researches relevant and considered beneficial to this topic of study were reviewed and divided into two parts. The first part explained the important of teacher as an educational input since teacher is considered to be the cause and also the solution of the widening educational inequality gap. The second part reviewed those studies that TFA teacher effectiveness was evaluated so that the basic knowledge was adapted as a foundation for this research.

III.I) *The importance of teacher's quality*

Educational inequality is associating with the unequal distribution of educational inputs between socio-economically advantaged and disadvantaged schools. The widening gap between education outcomes will worsen social disparity and weaken economic development further on (Sangmahamad, 2017). A research by Oppedisano and Turati (2011), analyzing educational inequalities by considering PISA test scores in 2000 and 2006, among different countries in Europe, found that, besides parental background, educational inequalities are determined significantly by schools' characteristics. Thus, it is undeniable that schools' resources endowment and educational practices are affecting students' achievement.

Teacher is one of the schools' resources that highly and directly impacts on students' achievement. This interpretation is supported by Darling-Hammond (2000) whose study was conducted among various school inputs, and found that teacher quality is significantly and positively correlated with student outcomes. Specifically, those teachers who were fully certified and majoring in the field of teaching showed highest positive correlation with student achievement on the National Assessment of Educational Progress. Hence, in order to control for teachers' quality, the standard of acquiring teaching license has to be high accordingly. However, the higher the standard, the higher the barrier to entry in this career path which resulting in teacher shortages, especially in socio-economically disadvantaged schools where qualified teachers are lacking and required to teach beyond their field of specialty, and eventually expanding the gap between socio-economically advantaged and disadvantaged schools.

III.II) *Evaluating Teach for America*

After the founding of Teach for America since 1989, there have been many researches concerning its effectiveness. Despite the strong core purpose of Teach for America to develop collective leaders to ensure all children have the opportunity to fulfill their potential, the effectiveness of this organization is still debatable since although the participants have strong academic backgrounds, they have never acquired teaching licenses, or even education-related background in their fields of study. In addition, they have only limited experience with teaching practice from only five to eight weeks of training after being selected. Nonetheless, the conventional route of training does not guarantee higher quality teacher, or becoming or remaining a teacher (Raymond, Fletcher, & Luque, 2001; Ballou & Podgursky, 1998).

The first ever study on this concern was conducted by Raymond, Fletcher and Luque (2001) using econometric analysis in Houston elementary and middle schools, but the study was conducted retrospectively, so randomized experimental design was not possible. However, they controlled for any possible differences on student, teacher and school characteristics through regression analysis. The findings showed that TFA teachers always produced positive impacts, and by testing through Teacher Fixed Effects models, TFA teachers were observed to have more consistent performance comparing to conventional route teachers, regardless of years of experience.

Nevertheless, because in the previous research TFA teachers were only tested within disadvantaged communities where many uncertified teachers were hired, the positive findings on the effectiveness of TFA seemed to be bias to some researchers. Hence, its positive effect was later disproved by some researches arguing that the previous study failed to address certification status or other teacher-certified factors in the model. Those researches showed significant negative effect from uncertified TFA teachers on student achievement, comparing to certified teachers. They also strongly stated that TFA and other alternative, uncertified teacher programs were harmful to those low-income students as the program would widen the gap between the performance of disadvantaged and advantaged students (Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005; Laczko-Kerr, & Berliner, 2002).

Fortunately, the later studies which applying randomized experimental design with regression analysis, including much larger sample size of at least six states in America found that there were statistically significant positive impact on Math scores and positive but not significant impact on Reading (Glazerman, Mayer, & Decker, 2006; U.S. Department of Education, 2013). With random class assignments for all students and random selection of the schools in which there were at least one TFA and one control teacher in every grade, along with large enough sample size in larger time frame, this setting ensured that the findings would have lower risk to contain any bias, unlike those earlier researches.

To conclude, those additional variables in the function, like certification status, years of experience, and majoring in the field of teaching, could turn the effect of TFA teachers to another way around, from positive to negative. However, in fact, the case where TFA teachers being assigned to schools with large number of high quality teachers was uncommon since TFA teachers were supposed to be the supply replacing the spots where high quality teacher were lacking, mainly in socio-economically disadvantaged schools. Hence, it does not make any sense to include those additional variables in the function. Moreover, researches with randomized experimental design contain less bias which means that the findings from those researches are surely closer to the accurate.

Thus, this research placed the conclusion that TFA teachers have positive impact on student achievement, significantly in Math and not so significant in Reading, as the basis for comparison with the studied country since although TFA teacher’s effectiveness was found and confirmed to be largely positive in many new, valid researches, it does not guarantee that the same practice would work exactly the same elsewhere.

IV. Theoretical Framework

According to the basis of Economic of Education, this research utilized the fundamental analytic tool, the Education Production Function (EPF), which mainly analyzing on the use of a set of school's inputs to produce a particular education output according to the production goal (Hanushek, 2007). EPF is completely different from firm's production function because there can be more than one production goal for individual schools or education system as a whole, unlike firm's production function where the only goal is to maximize the profit. The inputs are set according to the goal and the decision maker whom entitled for decision making authority, for examples, the school's principal, the Ministry of Education, or parents.

Based on the available data of TFT teachers and those being taught by TFT teachers, together with the goal of having TFT teacher within the school to improve students' performances, the function stated below was constructed using educational output, *Growth*, as the dependent variable to evaluate the essential educational inputs within the function. Both output and inputs included in the function were also discussed individually.

$$Growth = \beta_0 + \beta_1(TFT\ exp) + \beta_2(PreTest) + \beta_3(ClassLevel) + \beta_4(Subject) + \varepsilon$$

IV.I) *Output: Student Achievement*

Since teacher is one of the educational inputs, EPF can be used to evaluate teacher performance through constructing the function in which student achievement is an educational output and indicator of whether the teacher does contribute any significant impact through one's performance (Hanushek, 2007).

Along the line of using EPF to evaluate teacher performance, this research analyzed through the score difference of post- and pre-test which more than or equal to zero as the measurement of student achievement. Because every student taught by TFT teachers was required to take both pre-test and post-test for every semesters, and the test for each grade and subject was standardized and conducted by TFT throughout every participated school, this allows the analysis to be able to evaluate score growth without concerning the different difficulty-level if simply placing each schools' exam scores in the function.

IV.II) *Inputs: Teacher's experience*

Until today, there were four generations of TFT teachers. Each generation was assigned to the school in the beginning of second semester of that year. The first generation of TFT teachers had started teaching in the beginning of second semester in 2014, and the fourth generation, the latest, started teaching accordingly in 2017. Of course, although all TFT teachers probably acquired the same training, different teaching experiences, despite only a few semesters, can affect the findings.

Many studies have been done on teaching experience and student achievement. Unsurprisingly, they found that experienced teachers were more effective than those beginners, but the performance of new teachers tended to improve rapidly during the first few years (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2007; Ladd & Sorensen, 2015).

IV.III) *Inputs: Teaching subject*

According to the literature review section, many researches came to the conclusion that TFA teachers' effectiveness was highly pronounced in Math and positive but not significant in Reading (Glazerman, Mayer, & Decker, 2006; U.S. Department of Education, 2013). The effect of TFT teachers was also important to analyze whether it was pronounced in the same subjects or not.

TFT teachers were assigned to teach in Math, Science and English, all of which were being evaluated so that TFT teachers' strongest and weakest subjects were acknowledged, allowing further teaching or training strategy development.

IV.IV) *Inputs: Student's Initial Ability*

Because of the fact that students or human beings in general, learn and experience things in a cumulative manner either within or outside the classroom since they were born, each individual learning process which will be reflected on one's achievement depends not only on the teachers, but also on individual innate endowments or learning capacities (Hanushek, 2007). Although it highly impacts student achievement, student ability is hardly controlled since it cannot be quantified.

Hence, for this analysis, pre-test score was placed as the student's initial ability before each student was being taught by TFT teachers in any particular subject. Those who got high pre-test scores were expected to do even better in post-test, resulting in larger score growth, while the other who got low pre-test scores were also expected to improve, but in smaller growth.

IV.V) *Inputs: Class Level*

The environment in which students are being involved on average eight hours a day, classroom, is obvious to impact the student achievement. The Psychological Science research on sustained attention across human life span found the development in sustained-attention and task abilities were increased with age, but were eventually diminished beyond the age of 43 years old (Fortenbaugh, DeGutis, Germine, Wilmer, Grosso, Russo, & Esterman, 2015).

Since TFT teachers are mainly assigned to teach lower secondary students (G.7-G.9), the analysis concerned students within a few different ages. The higher class level was expected to perform better than the lower one since the students were older.

V. Methodology

V.I) *Data*

The data in this analysis is secondary data from TFT headquarter. It consists of pre-test and post-test scores in student-level for the second semester of academic year 2017, including all the participated schools that TFT teachers were assigned in total of twenty-six schools in six provinces in Thailand- Bangkok, Pathum Thani, Nakhon Sawan, Nonthaburi, Kanchanaburi and Samut Prakan- with total of 2,826 students. Most schools in this analysis were those mainly served lower to upper secondary students.

The total number of TFT teachers included in the analysis was thirty-six. Each of them taught Math, Science or English in lower secondary education (G.7-G.9). Those TFT teachers teaching within the period of study consists of third and fourth TFT generations whose teaching experience was three semesters (one year and a half) and one semester (half year), respectively. In order to simplify the analysis, TFT teachers with more than a year of experience were categorized as "experienced TFT teacher", and those with less than a year were categorized as "non-experienced TFT teacher".

V.II) *Statistical Analysis*

Due to some limitations on acquiring important data for constructing a valid "control group" to strengthen the analysis as the data of non-TFT teachers and their students were not able to access or be given for public disclosure, the analysis and evaluation were restrained which only allowed this research to be done among the treatment group within a specific period of time according to the available data.

The analysis of student achievement was based on the score difference of post- and pre-test which more than or equal to zero. The effects of achievement were tested with potential influencing factors: TFT teacher's experience, Subject, Pre-test score, and Class level. All factors, except Pre-test score, were treated as dummy variables. TFT teacher's experience was divided into two groups: experienced and non-experienced. Subject and Class level were quite straightforward. Subject consisted of Math, Science and English. Lastly, Class level consisted of G.7, G.8 and G.9.

Descriptive statistics was utilized to describe factors and score potentially influencing student achievement. In addition, to further enhance the analysis stepwise multiple regression was also utilized to test the effects of factors and score potentially influencing student achievement, and also explain the direction and magnitude of the effects.

VI. Analysis

VI.I) *Descriptive Statistics*

Out of all students in the study, 2,054 students performed relatively better or equal to their performance at the beginning of the semester, before being taught by TFT teacher. Within these positive-growth students, 703 students (34.2 percent) were G.7, 784 students (38.2 percent) were G.8, and 567 students (27.6 percent) were G.9. The number of positive-growth student who exposed to non-experienced TFT teacher was a little above that of experienced TFT teacher (Table 1).

Mean scores of pre-test and post-test were 22.8 and 29.3, respectively. Although the mean scores of pre- and post-test demonstrated the improvement in student performance, the higher standard deviation of post-test score indicated the wider spread of score from the mean (Table 2). Observing the descriptive statistics in Table 2 and 3, the distributions of the scores and score growth of each factor were not normal distribution, but instead, they were skewed to the right as the scores and score growths were cluster toward the lower end of the scale. In other words, although TFT teachers might impact student's score growth, according to descriptive statistics, the growth was not that high.

Table 1: Descriptive statistics of factors potentially influencing student achievement (n = 2,054)

Factor	n	Percent
Class Level		
• **G.7**	703	34.2
• **G.8**	784	38.2
• **G.9**	567	27.6
Subject		
• **Math**	398	19.4
• **Science**	932	45.4
• **English**	724	35.2
TFT teacher's Experience		
• **No**	1040	50.6
• **Yes**	1014	49.4

Table 2: Descriptive statistics of scores (n = 2,054)

Score	Min-to-Max	Mean	SD
Pre-test	0 – 100	22.80	16.85
Post-test	0 – 100	29.25	18.24
Growth	0 – 58	6.45	6.85

Table 3: Descriptive statistics of score growth of factors potentially influencing student achievement (n = 2,054)

Factor	Min-to-Max	Mean	SD
Class Level			
• **G.7**	0 – 58	7.13	7.80
• **G.8**	0 – 26	4.93	4.51
• **G.9**	0 – 53	7.71	7.84
Subject			
• **Math**	0 – 32	6.46	5.78
• **Science**	0 – 27	4.91	3.89
• **English**	0 – 53	8.42	9.41

Table 4 demonstrated mean difference of each pair of variables within the same group. The reason that the comparison was not done through T-test is that if the comparison is done through T-test, there are going to be total of three pairs in each factor: Class Level or Subject, causing the significance level to decrease. The α, significant at the 0.05 level, will have to be calculated in the format of $(1 - 0.05)^3$, making the findings less significant. The mean difference was shown to be significant, except that of G.7 and G.9 which means that the mean performance of both groups of student were not as distinct.

Table 4: Multiple comparison of mean difference of factors potentially influencing student achievement (The dependent variable: Growth)

Factor (I)	**Comparison Factor (J)**	**Mean Difference (I – J)**	**Sig.**
Class Level			
G.7	**G.8**	2.198*	< 0.001
	G.9	-0.587	0.306
G.8	**G.7**	-2.198*	< 0.001
	G.9	-2.785*	< 0.001
G.9	**G.7**	0.587	0.306
	G.8	2.785*	< 0.001
Subject			
Math	**Science**	1.547*	0.001
	English	-1.966*	< 0.001
Science	**Math**	-1.547*	0.001
	English	-3.512*	< 0.001
English	**Math**	1.966*	< 0.001
	Science	3.512*	< 0.001

* The mean difference is significant at the 0.05 level

VI.II) ***Multiple Regression Analysis***

In order to test the direction and magnitude of the effect of each factor potentially influencing student achievement, multiple regression analysis was utilized. Growth which was the score difference of post- and pre-test, more than or equal to zero, was designated as dependent variable.

The results from the multiple regression analysis (shown in Table 5) demonstrated that the largest effect was TFT teacher's experience which, however, went negative (-3.145). This finding contradicted the previous researches' conclusion on positive correlation between teacher's years of experience on student achievement.

Even though the analysis had included all three subjects, only English and Math showed significant effects on student achievement, especially English (4.653). Like subjects included in the analysis, class level was consisting of all lower secondary students taught by TFT teachers, but not all of them had significant effect. Only G.8 showed significant, despite negative effect.

Pre-test also surprisingly showed significantly negative effect (-0.056), meaning that the student with higher pre-test score tended to get lower the score growth.

Table 5: Factors predicting student achievement growth

Variable	B	SE	Beta	T	Sig.
(Constant)	7.587	0.293		25.874	< 0.001
TFT teacher's Experience	-3.145	0.303	-0.229	-10.364	< 0.001
English	4.653	0.390	0.324	11.915	< 0.001
Pre-test	-0.056	0.019	-0.138	-5.499	< 0.001
Math	1.621	0.410	0.093	3.949	< 0.001
G.8	-0.689	0.317	-0.049	-2.177	0.030

Of course, the multiple regression analysis is always accompanied with some statistical problems. Even though not all of them were being acknowledged since the tests require more time to be done, a few important statistical problems were being tested whether or not this analysis contained them.

Since the model in this research contains mostly independent dummy variables, only Pre-test is not. Moreover, each variable is distinct and not correlating with one another. This means that this analysis did not face with the problem of Multicollinearity.

Autocorrelation problem could be observed through Durbin-Watson statistic (D). Because this regression analysis found D = 1.378 (not shown). As a result, d_U = 1.69 and d_L = 1.65. Thus, from $D < d_L$, it is demonstrated that the analysis did not against the assumptions. There is no the problem of Autocorrelation here.

VII. Discussion

According to the analysis section, many interesting findings were acknowledged. However, even though these findings were conflicting previous researches, they were facts which needed to be interpreted so that the research question of whether TFT teachers have improved the student academic achievement is explained and answered.

Designating the growth of the students' performance as dependent variable, TFT teachers were showed to be most effective in teaching English, and effective but smaller impact in Math. This findings contradicted the findings of those studies on TFA which demonstrating a reverse result; positively significant effect of TFA teachers in Math, but not significant in Reading. Moreover, the findings also showed that G.8 students are performing the worst in the test, which contradicting the previous study that ability to sustain attention increases with age.

Further analysis also indicated that one additional year of experience of TFT teachers actually produced negative impact; meaning that less experienced TFT teachers performed better than those with more experienced. This result could be the outcome from the improvement in recruiting and training structures of TFT over the year. Another possible reason is TFT's excellent reputation among new generation of Thai people. Because TFT has been more well-known for its valuable source of real-world experience that one could not ever find elsewhere, along with its after-commitment payoff in term of TFT alumni status, there has been increasing interest in participating from newly graduates with strong academic background and leadership capacity. Following the basic economics model, with higher demand, those who would like to participate have to compete for the limited spots. As a result, those who are able to get the spot are those who are the most effective.

Focusing on the analysis of student initial ability through pre-test score, TFT teachers tended to impact more on worse performing students since regression analysis showed negative effect of pre-test score on growth. As a result, with large score growth, these worse performing students in pre-test were moving closer to those well performing in post-test. A possible reason might be that TFT teachers usually come up with their own teaching strategies that increase student engagement and motivation to learn. This finding was actually fulfilled what TFT was aiming for; to reduce educational inequality gap.

These findings provide support for the potential value of TFT teachers to Thai society, and ensure that over the long-run, the positive impact will likely be stronger, contributing these disadvantaged students higher opportunities in life and reducing the gap of educational inequality. Thus, I would answer the research question that TFT program actually improve student achievement.

VII.I) *Limitations*

With full knowledge that this research could be done in a more realistic way so that the findings are going to be as robust as possible, however, due to some limitations, this research was restrained from the expectation.

The data of teachers who were not participating in TFT and that of students who were not being taught by TFT teachers at the same grade, within the same school, was not able to access or be given for public disclosure. As a result of this unfortunate circumstance, this research was not able to properly conduct the experimental analysis through comparing treatment and control groups. However, it has been done in the best way it could be, regarding these limitations.

VII.II) *Implementation*

According to the findings, it is interesting to further observe the differences in TFT training strategies across the years since the result showed that the later generation of TFT teachers tended to perform better than those who were launched the year before, so there is the possibility that the later training strategy is the key factor to better performance, based on student achievement.

Furthermore, due to the limitations faced in this research, if the data becomes more accessible, the best way to prove or disprove this research is through comparing the performance of TFT teachers and conventional route, non-TFT teachers who own teaching experience not exceeding three years, and teaching the same subject, at the same class level, and within the same school. After selecting the matching pair of TFT and non-TFT teachers for each school, then the analysis can be done across schools using national standardized test.

VIII. Conclusion

This research evaluated the impact of TFT teachers on student achievement in the second semester, academic year 2017. The analysis was based on pre-test and post-test scores in Math, Science and English of lower secondary students. The statistical analysis, through descriptive statistics and multiple regression, concluded that TFT teachers improved student achievement. Even though there are some minor differences in result from those of TFA, it did not change the fact that the program actually success in both countries. Moreover, for the case of TFT, worse performing students were addressed to be those who benefit the most. This reflects their effort in teaching and putting such closed attention to students under their care.

Due to the limitations faced in this research, a more valid research is highly recommended to be conducted. Nonetheless, since this research was done in the best way possible with the available data, although it is not ideal, the findings were significant enough to suggest that TFT is the program that is worth supporting, and should be encouraged to spread its value nationwide.

References

Darling-Hammond, L. (2000). *Teacher Quality and Student Achievement: A Review of State Policy Evidence.* Retrieved April 19, 2018, from https://epaa.asu.edu/ojs/article/viewFile/392/515

Darling-Hammond, L., et al. (2005). *Does Teacher Preparation Matter? Evidence about Teacher Certification, Teach for America, and Teacher Effectiveness*. Retrieved January 22, 2018, from https://epaa.asu.edu/ojs/article/view/147

Fortenbaugh, F., et al. (2015). *Sustained Attention Across the Life Span in a Sample of 10,000: Dissociating Ability and Strategy.* Retrieved May 3, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4567490/

Glazerman, S., et al. (2006). *Alternative Routes to Teaching: The Impacts of Teach for America on Student Achievement and Other Outcomes.* Retrieved January 22, 2018, from https://www.jstor.org/stable/30162702

Hanover Research. (2016). *Teacher Experience and Student Achievement.* Retrieved May 14, 2018, from http://webcache.googleusercontent.com/search?q=cache:http://gssaweb.org/wp-content/uploads/2016/05/Teacher-Experience-and-Student-Achievement.pdf

Hanushek, E. (2007). *Education Production Functions.* Retrieved April 16, 2018, from https://hanushek.stanford.edu/sites/default/files/publications/Hanushek%202008%20Palgrave Dict.pdf

Harris, D. & Sass, T. (2008). *Teacher Training, Teacher Quality, and Student Achievement.* Retrieved April 19, 2018, from https://files.eric.ed.gov/fulltext/ED509656.pdf

Laczko-Kerr, I. & Berliner, D. (2002). *The Effectiveness of "Teach for America" and Other Under-certified Teachers on Student Academic Achievement: A Case of Harmful Public Policy*. Retrieved January 22, 2018, from http://epaa.asu.edu/epaa/v10n37/

Ladd, H. & Sorensen, L. (2015). *Returns to Teacher Experience: Student Achievement and Motivation in Middle School.* Retrieved April 16, 2018, from https://caldercenter.org/sites/default/files/WP%20112%20Update_0.pdf

Oppedisano, V. & Turati, G. (2011). *What are the Causes of Educational Inequalities and of their Evolution over time in Europe? Evidence from PISA.* Retrieved February 23, 2018, from http://www.ub.edu/ubeconomics/wp-content/uploads/2012/02/Doc2011-1.pdf

Phongpaichit, P. & Benyaapikul, P. (2013). *Political Economy Dimension of a Middle Income Trap: Challenges and Opportunities for Policy Reform, Thailand.* Retrieved February 23, 2018, from http://www.econ.chula.ac.th/public/publication/books/pdf/Political%20Economy%20Dimension%20of%20aMiddle%20Income%20Trap%20Thailand.pdf

Raymond, M., et al. (2001). *An Evaluation of Teacher Differences and Student Outcomes in Houston, Texas*. Retrieved February 8, 2018, from https://credo.stanford.edu/downloads/tfa.pdf

Sangmahamad, R. (2017). *Disparities in Education: Social Quality in Thai's Views.* Retrieved February 22, 2018, from https://www.tci-thaijo.org/index.php/polscicmujournal/article/view/91310/71727

Teach For Thailand. (2014). *Annual Report 2014.* Retrieved January 22, 2018, from http://teachforthailand.org/TH/img/01TFTAnnualReport2014_FinalDesktop_2.pdf

U.S. Department of Education. (2013). *The Effectiveness of Secondary Math Teachers from Teach For America and the Teaching Fellows Programs*. Retrieved January 22, 2018, from https://ies.ed.gov/ncee/pubs/20134015/pdf/20134015.pdf

Zuzovsky, R. (2009). *Teachers' Qualifications and Their Impact on Student Achievement Findings from TIMSS-2003 Data in Israel.* Retrieved April 16, 2018, from http://www.iea.nl/sites/default/files/irc//IRC2008_Zuzovsky2.pdf