THE RELATIONSHIP OF ENGLISH LANGUAGE USAGE SKILLS, ENGLISH READING PROFICIENCY, AND ENGLISH SELF-EFFICACY WITH MATHEMATICS ACADEMIC ACHIEVEMENT OF GRADES 3-4 AND GRADES 5-6 STUDENTS AT PAN-ASIA INTERNATIONAL SCHOOL, BANGKOK, THAILAND

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Abstract: This quantitative correlational study aimed to investigate whether there was a significant relationship of English language usage skills, English reading proficiency, and English self-efficacy with mathematics academic achievement of Grades 3-4 and Grades 5-6 students at Pan-Asia International School Bangkok, Thailand, at a significance level of .05. The target population of this research was all 42 Grades 3-4 students and 51 Grades 5-6 students who were enrolled in the academic year 2019 – 2020. Some of the students were not able to take MAP Tests or the questionnaire due to their absence. That is why the sample for this research became 39 Grades 3-4 students and 49 Grades 5-6 students at Pan- Asia International School, Bangkok, Thailand. In order to determine the students' level of English language usage skills, English reading proficiency, and mathematics academic achievement, the Measure of Academic Progress (MAP) Tests scores were used. The second research instrument was the Questionnaire of English Self-Efficacy (QESE; Wang et al., 2013), which was used to measure the students' English self-efficacy level.

Descriptive statistics (means and standard deviations) and correlational analysis (using multiple correlation coefficients) were applied to analyze the relationship between the independent variables (English language usage skills, English reading proficiency, and English self-efficacy) and the dependent variable (mathematics academic achievement). According to the research findings, the results of Grades 3-4 and Grade 5-6 students were below the student achievement norm levels in English language usage, English reading, and mathematics, which were determined and provided by Northwest

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Evaluation Association (NWEA). In Grades 3-4 and Grades 5-6, students' perceived self-efficacy in English was moderately high. The correlational analysis revealed that the mathematics academic achievement of Grades 3-4 students was positively, significantly, and very strongly correlated with their English language usage skills, English reading proficiency, and English self-efficacy. It also indicated that there were positive, significant, strong multiple correlations among English language usage skills, English reading proficiency, English self-efficacy, and mathematics academic achievement of Grade 5-6 students.

Keywords: English language usage skills, English reading, English self-efficacy, mathematics academic achievement

Introduction

In recent centuries, mathematics has played a crucial role in science, technology, engineering, communication, and the internet. (National Research Council, 2013). It is evident that students must develop 21st-century skills, including critical thinking and problem solving, collaboration across networks, agility and adaptability, effective communication, and accessing and analyzing information. English language usage skills, English reading proficiency, and English self-efficacy each separately and also together have a profound effect on students' learning in different areas. When non-native English-speaking students learn mathematics in English, it would be a more significant issue for them, especially since solving mathematics problems requires reading comprehension skills. Various research proposes that language proficiency impacts children's mathematics achievement (Abedi & Lord, 2001; Brown, 2005). Self-efficacy is a crucial component in learning, and Bandura defined self-efficacy as an individual's belief in their ability to succeed in a given task and reach the desired goal or outcome at the end of a process (Bandura, 1977). Many researchers, including Bandura, have demonstrated that self-efficacy affects human motivation, persistence, effort in the face of difficulty, action, behavior, and achievement (Bandura, 1994; Zimmerman, 2000).

Pan-Asia International School has been implementing American Common Core State Standards in mathematics classes from kindergarten to Grade 10 since 2004. These prompt standards students to solve real-life word problems. The school also promotes inquiry-based teaching and learning in mathematics classes and all subjects, which requires advanced English language skills to grasp the new concepts and make inferences. The researcher observed that high school students of Pan-Asia International School struggled to solve word problems since they had difficulty understanding the content of the questions

and struggled to express their solutions in English. The discussions with lower grades teachers and their test results indicated similar concerns. The researcher decided to research Grades 3-4 and Grades 5-6 students because they already had the foundational education for mathematics and English in these years, and the progress of the students at these ages is easy to recognize after an intervention. The researcher did not choose earlier ages since younger students were not familiar with the test techniques and they were not well-versed with computer use.

Research Objectives

1. Regarding the purposes of this research, the following objectives were developed to guide the study.
2. To determine the level of English language usage skills of Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.
3. To determine the level of English reading proficiency of Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.
4. To determine the level of English self-efficacy of Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.
5. To determine the level of mathematics academic achievement of Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.
6. To determine whether there is a significant relationship of English language usage skills, English reading proficiency, and English self-efficacy with mathematics academic achievement for Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.

Research Hypothesis

There is a significant relationship of English language usage skills, English reading proficiency, and English self-efficacy with mathematics academic achievement of Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand, at a significance level of .05.

Conceptual Framework

Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand, are the focus of this study. This study is a correlational study that aims to investigate the relationship between English language usage skills, English reading proficiency, English self-efficacy, and mathematics academic achievement among Grades 3-4 and Grades 5-6 students at Pan-Asia International School. The researcher considered English language usage skills, English reading proficiency, and English self-efficacy as independent variables and mathematics academic achievement as a dependent variable. Figure 1 exhibits the conceptual framework of this study.

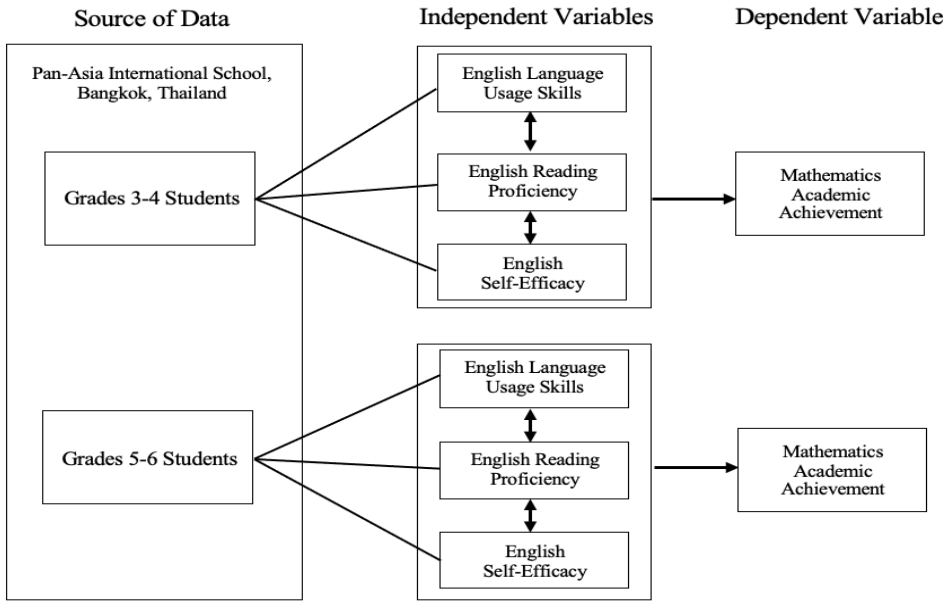

Figure 1. Conceptual Framework of the Study

Literature Review

Social Cognitive Theory

Bandura (1989) modeled causation using personal, behavioral, and environmental factors and stated that these three determinants affect each other bidirectionally. According to Bandura (1989), due to the bidirectional association between behavior and the external factors, people design their environment while, at the same time, their environment molds them (Bandura, 1989). Bandura emphasizes human agency, and social cognitive theory views humans as agentic operators; that is why they contribute to their own decisions, behaviors, and development. The social cognitive theory addresses specific capabilities as its foundation, and these capabilities define being human (Pajares, 2002). These symbolize vicarious, forethought, self-regulatory, and self-reflective capabilities.

Self-Efficacy

Self-efficacy belief is another main concept grounded in social cognitive theory. According to Bandura, self-efficacy is an individual's confidence in their ability to succeed in a given task and reach the desired goal or outcome at the end of a process (Bandura, 1977). In the academic context, self-efficacy beliefs play a crucial role in students' behavior and motivation to succeed (Zimmerman, 2000). Several causes develop self-efficacy beliefs in human beings. According to Bandura, four significant sources of information

construct and adjust people's beliefs about their efficacy. These sources are mastery experiences, vicarious experiences, verbal persuasions (social persuasions), and physiological states (Bandura, 1977, 1994, 1999a, 1999b).

Krashen's Theory of Second Language Acquisition

Every individual is different since they come from different backgrounds with different attitudes towards learning. Krashen (1982) argued that modern education focuses on the students' differences rather than the similarities in the way they acquire a new language. According to Krashen, language acquisition is a process that is the same for every person despite their differences, just like breathing, digesting, and sleeping.

Krashen (1982) claimed that the current language acquisition theory is studied under theoretical linguistics without having practical applications. It consists of generalizations or hypotheses that are backed up with data from experiments. Krashen claimed his five hypotheses regarding second/foreign language acquisition are backed up with enough experimental and other forms of data, such as observational data. Although a theory is usually an abstract idea, he claims that a good theory can be practical in the case of second/foreign language learning (Krashen, 1982). His five hypotheses regarding second/foreign language acquisition are the acquisition-learning distinction, the natural order hypothesis, the monitor hypothesis, the input hypothesis, and the affective filter hypothesis.

Method

This study aimed to investigate the relationship of English language usage skills, English reading proficiency, and English self-efficacy with mathematics academic achievement of Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand. Due to this purpose, this study employed a quantitative, correlational research design consisting of descriptive statistics and correlation analysis (using multiple correlation coefficients).

The researcher collected the results of MAP Tests in English and mathematics, which were conducted in the 2019-2020 academic year at Pan-Asia International School to find the level of English usage skills, English reading proficiency skills, and mathematics academic achievement. As for determining the level of English self-efficacy, students were given the Questionnaire of English Self-Efficacy (Wang et al., 2013).

Descriptive statistics were used to determine the level of English language usage skills, English reading proficiency, English self-efficacy, and

mathematics academic achievement. Correlation analysis (using multiple correlation coefficient) was used to determine whether there was a significant relationship of English usage skills, English reading proficiency, and English self-efficacy with mathematics academic achievement for Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.

The research was conducted among the young students after homeroom teachers and subject teachers notified the parents of the target students and received parental consent. The MAP Tests and the questionnaire were conducted under fair conditions for all students.

Population and Sample

This study focused on a population sample consisting of all 42 Grades 3-4 and 51 Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand, who were enrolled in the academic year 2019-2020. However, some of the students were not able to take the MAP Tests or complete the questionnaire. That is why the sample for this research became 39 Grades 3-4 students and 49 Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.

Research Instruments

The Questionnaire of English Self-Efficacy (QESE; Wang et al., 2013) and the Measure of Academic Progress (MAP) Tests were used to collect data on the level of English self-efficacy, English language usage skills, and English reading proficiency and mathematics academic achievement.

The Questionnaire of English Self-Efficacy (QESE)

The Questionnaire of English Self-Efficacy (QESE; Wang et al., 2013) consists of 32 items, and it was given to the Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand. Table 1 presents the internal consistency reliability of the Questionnaire of English Self-Efficacy.

Table 1. *The Internal Consistency Reliability of Questionnaire of English Self-Efficacy (QESE)*

Subscale	Cronbach's alpha (Wang et al., 2013)	Current study	Internal consistency
Listening, reading, writing, and speaking self-efficacy	.96	.96	Excellent

Students were required to rate their capabilities on a 7-point Likert scale from 1 (*I am totally unable to do this*) to 7 (*I am able to do this well*) for each item.

Table 2 shows the number of items and item numbers for each factor and their score ranges.
In Table 2, the level of agreement, the scale of the scores, and their interpretations are given.

Table 2. *Level of Agreement, Scores, Scales, and Interpretations of English Self-Efficacy*

Level of agreement	Score	Scale	Interpretation
I am able to do this well	7	6.51-7.00	Very high
I am able to do this	6	5.51-6.50	Moderately high
I am basically and in principle able to do this	5	4.51-5.50	Slightly high
I am possibly able to do this	4	3.51-4.50	Neither high nor low
I am possibly unable to do this	3	2.51-3.50	Slightly low
I am unable to do this	2	1.51-2.50	Moderately low
I am totally unable to do this	1	1.00-1.50	Very low

The Measure of Academic Progress (MAP) Test
The Measure of Academic Progress (MAP) Test is a standardized assessment, computerized, adaptive test in mathematics, English, and science, which is based on American Common Core State Standards (CCSS) for mathematics and English and Next Generation Science Standards (NGSS) for science. The MAP test is produced by the Northwest Evaluation Association (NWEA) for the students from Kindergarten 3 to Grade 12 students. The tests are untimed, and the estimated time to complete each test is around forty minutes to one hour. The MAP tests consist of different types of questions, such as multiple-choice questions and drag-and-drop items (Northwest Evaluation Association, 2019).

Table 3. presents the internal consistency reliability of the tests in language usage, reading, and mathematics for Grades 3-4 and Grades 5-6.

Table 3. *The Internal Consistency Reliability of the MAP Test*

Grade level	Content area	Cronbach's alpha (NWEA, 2008)
3 to 6	Language usage	.93 to .96
	Reading	.93 to .95
	Mathematics	.95 to .97

Table 4 presents the interpretation of the MAP Tests scores for English language usage, English reading, and mathematics for Grades 3-4 students at Pan-Asia International School, Bangkok, Thailand.

Table 4. *Interpretation of the MAP Language Usage, Reading, and Mathematics Scores for Grades 3-4 Students at Pan-Asia International School, Bangkok, Thailand*

Content area	Below norm level	On norm level	Beyond norm level
Language usage	< 192	192-203	> 203
Reading	< 191	191-202	> 202
Mathematics	< 193	193-203	> 203

Table 5 presents the interpretation of the MAP Tests scores for English language usage, English reading, and mathematics for Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.

Table 5. *Interpretation of the MAP Language Usage, Reading and Mathematics Scores for Grades 5-6 Students at Pan-Asia International School, Bangkok, Thailand*

Content area	Below norm level	On norm level	Beyond norm level
Language usage	< 206	206-216	> 216
Reading	< 205	205-216	> 216
Mathematics	< 209	209-221	> 221

Findings

The quantitative correlational study findings are presented according to the objectives.

Findings from Research Objective 1

Table 6 presents the mean scores, standard deviations, and interpretations for the level of English language usage skills of Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.

Table 6. *Mean Scores, Standard Deviations, and Interpretations for the Level of English Language Usage Skills of Grades 3-4 and Grades 5-6 Students at Pan-Asia International School, Bangkok, Thailand*

Grade levels	*n*	*M*	*SD*	Interpretation
Grades 3-4	39	184.36	17.83	Below norm level
Grades 5-6	49	201.12	15.53	Below norm level

According to the results displayed in Table 6, the mean scores of Grades 3-4 and Grade 5-6 students in the English language usage test were 184.36 and 201.12, respectively. The interpretation of the mean scores of both groups was below level (see Table 4 and Table 5). This indicated that Grades 3-4 students were able to choose punctuation to achieve the desired effect, combine sentences for concise expression, etc. and also Grades 5-6 students in this group were able to revise for precise word choice, use correct subject-verb agreement when the subject is an irregular noun, etc. according to American Common Core State Standards (Common Core State Standards Initiative, 2009).

Findings from Research Objective 2

Table 7 presents the mean scores, standard deviations, and interpretations for the level of English reading proficiency of Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.

Table 7. *Mean Scores, Standard Deviations, and Interpretations for the Level of English Reading Proficiency of Grades 3-4 and Grades 5-6 Students at Pan-Asia International School, Bangkok, Thailand*

Grade levels	*n*	*M*	*SD*	Interpretation
Grades 3-4	39	180.59	17.11	Below norm level
Grades 5-6	49	196.86	16.48	Below norm level

Table 7 presents that the mean scores of Grades 3-4 and Grade 5-6 students in the English reading test were 180.59 and 196.86, respectively. The interpretation of the mean scores of both groups was below level (see Table 4 and Table 5). Grades 3-4 and Grade 5-6 students were able to draw conclusions from literary and informative text, summarize literary and informative text, understand the meaning of common idioms, etc. (Common Core State Standards Initiative, 2009).

Findings from Research Objective 3

Table 8 presents overall mean scores, standard deviations, and interpretations for the level of English self-efficacy of Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.

Table 8. *Overall Mean Scores, Standard Deviations, and Interpretations for the Level of English Self-Efficacy of Grades 3-4 and Grades 5-6 Students at Pan-Asia International School, Bangkok, Thailand*

Grade levels	*n*	*M*	*SD*	Interpretation
Grades 3-4	39	5.58	.91	Moderately high
Grades 5-6	49	5.56	1.00	Moderately high

Table 8 indicates that the mean scores of Grades 3-4 and Grade 5-6 students were 5.58 and 5.56, respectively. The interpretation of the mean scores of both groups was moderately high (see Table 2).

Findings from Research Objective 4

Table 9 presents the mean scores, standard deviations, and interpretations for the level of mathematics academic achievement of Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.

Table 9. *Mean Scores, Standard Deviations, and Interpretations for the Level of Mathematics Academic Achievement of Grades 3-4 and Grades 5-6 Students at Pan-Asia International School, Bangkok, Thailand*

Grade levels	*n*	*M*	*SD*	Interpretation
Grades 3-4	39	188.33	14.13	Below norm level
Grades 5-6	49	208.37	14.80	Below norm level

Table 9 indicates that the mean scores of Grades 3-4 and Grade 5-6 students in mathematics tests were 188.33 and 208.37, respectively. The interpretation of the mean scores of both groups was below level (see Table 4 and Table 5). Grades 3-4 students were able to multiply or divide to solve word problems involving multiplicative comparison, fluently add and subtract multi-digit whole numbers using the standard algorithm, etc. As for Grade 5-6, the students were able to evaluate numerical expressions involving addition and subtraction with whole numbers and parentheses, solve problems involving perimeters of rectangles within a real-world, etc. (Common Core State Standards Initiative, 2009).

Findings from Research Objective 5

Table 10 shows the bivariate correlations between these four variables for Grades 3-4 students at Pan-Asia International School, Bangkok, Thailand.

Table 10. *Bivariate Correlations Between Grades 3-4 Students' English Self-Efficacy, English Reading Proficiency, English Language Usage Skills and Mathematics Academic Achievement at Pan-Asia International School, Bangkok, Thailand*

Variables	1	2	3	4
1. English self-efficacy	-			
2. English reading proficiency	.50** (< .001)	-		

Variables	1	2	3	4
3. English language usage skills	.54**(< .001)	.89**(< .001)	-	
4.Mathematics academic achievement	.52** (< .001)	.83** (< .001)	.81**(< .001)	-

Note. **denotes a statistically significant relationship (statistical significance level set at p = .05, two-tailed). p-values appear within parentheses below the correlation coefficients.

After conducting correlational analysis, the researcher found a significant, very strong multiple correlations between the independent variables (English language usage skills, English reading proficiency, and English self-efficacy) and the dependent variable, mathematics academic achievement, (R = .85, F (3,35) = 29.39, p < .001).

Table 11 shows the bivariate correlations between these four variables for Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand.

Table 11. *Bivariate Correlations Between Grades 5-6 Students' English Self-Efficacy, English Reading Proficiency, English Language Usage Skills, and Mathematics Academic Achievement at Pan-Asia International School, Bangkok, Thailand*

Variables	1	2	3	4
1. English self-efficacy	-			
2. English reading proficiency	.55**(< .001)	-		
3. English language usage skills	.52**(< .001)	.82**(< .001)	-	
4.Mathematics academic achievement	.39**(.006)	.65**(< .001)	.78**(<.001)	-

Note. **denotes a statistically significant relationship (statistical significance level set at p = .05, two-tailed). p-values appear within parentheses below the correlation coefficients.

Correlational analysis indicated significant, strong multiple correlations between the independent variables (English self-efficacy, English reading proficiency, and English language usage skills) and the dependent variable (mathematics academic achievement)

(R = .78, F (3,45) = 23.33, p < .001).

Discussion

English Reading Proficiency and English Usage Skills with Mathematics Academic Achievement

The findings from this study showed that there was a very strong correlation between English language usage skills and mathematics academic achievement and also between English reading proficiency and mathematics academic achievement for Grades 3-4 students and Grade 5-6 students at Pan-Asia International School, Bangkok, Thailand. The MAP Tests are conducted worldwide in more than 9,500 schools in 145 countries, and student achievement norms in each subject were determined based on all students' mean scores (Northwest Evaluation Association, 2020). The researcher determined the students' achievement level in English language usage, English reading, and mathematics by comparing students' scores with the last updated grade-level student achievement norm provided by NWEA. In each group, English test scores and mathematics scores were lower than the achievement norm.

Pan-Asia International School uses the American Common Core State Standards (CCSS) in English and mathematics subjects. The student's level of English plays a significant role in mathematics in terms of understanding the new concepts, instructions in the classroom, the meaning, and keywords of the questions, and also in the classroom setup; it is essential for students to be able to express their solutions and answers both verbally and in writing.

Bagceci et al. (2014) researched the relationship between freshman students' achievement in a foreign language and mathematics classes at the engineering faculty of Gaziantep University, Turkey. The findings of this research were in line with their findings, and they found a positive correlation between English and mathematics achievement. Likewise, Abedi and Lord (2001) investigated the impact of language on Grade 8 students' performance in word problems in mathematics tests, and their findings revealed a positive correlation between these two variables in Los Angeles. Another major study administered by Brown (2005) in Maryland, USA, among sixty-five thousand Grade 3 students showed that the level of English proficiency significantly influenced mathematics achievement.

English Self-Efficacy with Mathematics Academic Achievement

In this study, the researcher found that English self-efficacy was positively, moderately strong, and significantly correlated with mathematics academic achievement for Grades 3-4 students, and the same correlation among Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand, was weaker. However, the findings indicated that both groups of students had

moderately high self-efficacy in English even though mathematics academic achievement was lower than student achievement norm level.

The students in the target group had been studying English since Kindergarten, and throughout the years, they studied at an English medium school. Besides academics, they performed various extracurricular activities using English and used English daily in the school with their friends due to the diverse environment. Therefore, this might be one of the reasons for high self-efficacy beliefs in English. The slight decrease in self-efficacy in Grade 5-6 students might be caused by the students' transition to adolescence period and middle school. This result was aligned with Pintrich and Schunk's (1996) article and meta-analysis of Carpenter (2007) among 38 publications consisting of 48 studies with a total sample size of 12,466 students, which stated that the overall mean level of self-efficacy belief decreases by age and they asserted that the greatest decline occurs during the transition to middle school. On the other hand, there may be a few reasons for low achievement in the tests, such as lack of practice for a specific type of test, not taking the tests seriously, and lack of curriculum alignment with the test content. In this case, English self-efficacy is vital for students to improve their English language usage skills and reading proficiency since they strongly correlate with mathematics academic achievement. Köseoğlu (2015) researched two hundred fourteen undergraduate students in Turkey, and Motlagh et al. (2011) conducted a study among two hundred fifty high school students in Iran. Both studies revealed that self-efficacy played a critical role in academic achievement.

English Self-Efficacy with English Language Usage Skills and English Reading Proficiency

This study's findings revealed that for Grades 3-4 and Grades 5-6 students at Pan-Asia International School, Bangkok, Thailand, English self-efficacy and English language usage skills, and English self-efficacy and English reading proficiency were both moderately strongly correlated. This result was in line with Jumana and Meera's (2015) study among 520 secondary school students in Kerala, India. Their study also revealed that students with firm self-efficacy showed better performance in learning and thinking in English. Also, Kitikanan and Sasimonton's (2017) research on 32 fourth-year English learners in Thailand indicated that self-efficacy strongly correlated to the overall English learning accomplishment.

According to Zimmerman (2000), students with high perceived self-efficacy are more determined to accomplish, and mastery and vicarious experiences are the two sources of self-efficacy beliefs (Bandura, 1994). Since the medium

of instruction at Pan-Asia International School was English, students had enough chances to use and experience English themselves. Also, students observed their classmates' performances on various occasions, such as class presentations, stage shows, in school competitions. This led to developing their English self-efficacy, which could influence the development of their English language usage skills and English reading proficiency

Recommendations

This section presents the following recommendation for students, teachers, administrators, and future researchers based on this research's findings.

Recommendations for Students

This research revealed that the level of English had a significant influence on mathematics academic achievement. Especially the contribution of English language usage skills and English reading proficiency was strong. Therefore, students should aim to improve their English language usage skills and reading proficiency to achieve higher mathematics achievement by using various methods such as reading more books and magazines, watching TV programs, and listening to educational podcasts. This would enhance their vocabulary and also their comprehension skills. In order to build up confidence in English, students should use it daily, and in the activities they enjoy.

Recommendations for Teachers

The current study revealed that English self-efficacy was moderately strong and significantly correlated with English reading proficiency and English usage skills, and self-efficacy was significantly correlated with mathematics academic achievement. Self-efficacy is not only crucial for mathematics academic achievement or developing English language skills, but also it is essential for students in any aspect of their lives. Teachers should be aware that the four sources of self-efficacy, mastery experiences, vicarious experience, social persuasion, and physiological factors substantially influence learning. Even though overall students' self-efficacy was not low for Grades 3-4 and Grade 5-6 students at Pan-Asia International School, Bangkok, Thailand, teachers should design their lessons in which students can be involved as much as possible and gain mastery and vicarious experiences. Moreover, teachers should create a learning environment where students can feel comfortable growing their skills and supporting them to improve their confidence levels. Teachers treating students inside and outside the mathematics classroom should be motivating and encouraging. This study also revealed a positive, strong, significant correlation between English language usage skills and English reading proficiency with mathematics

academic achievement. Therefore, English language teachers should improve students' reading and language usage skills by using various methods such as guided reading, read-aloud activities, and group work to improve comprehension skills.

Recommendations for School Administrators

This study's findings show the importance of students' level of English language usage skills, English reading proficiency, English self-efficacy, and their influence on students' mathematics achievement. School administrators can infer that this might be a significant matter for all other subject areas in which students study English. Therefore, school administrators should ensure that teachers have the right resources, teaching environment, and training to enhance students' self-efficacy and all types of English skills. Furthermore, curriculum review and related professional development might be needed to investigate the reasons for low scores in English language usage, reading, and mathematics tests.

Recommendations for Future Researchers

This research revealed a significant correlation between students' English language usage skills, English reading proficiency, and English self-efficacy with their mathematics academic achievement. Future researchers may extend the sample size by using data from different grade levels. Another research about the influence of the level of English on another subject may emphasize the importance of English. Future researchers can use different research instruments to examine the level of English language usage skills, English reading proficiency, English self-efficacy, and mathematics academic achievement. Besides the quantitative research, a qualitative study would support a deeper understanding regarding this issue.

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