

**A CORRELATIONAL-COMPARATIVE STUDY OF PERCEPTION
OF ICT USE IN THE CLASSROOM AND ACADEMIC
ACHIEVEMENT OF GRADES 3 AND 4 STUDENTS IN CHINESE
LANGUAGE CLASS AT PRASARNMIT PRIMARY SCHOOL
INTERNATIONAL PROGRAM IN BANGKOK, THAILAND**

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Abstract: This study was conducted to identify whether there was a significant difference in perception of ICT use in the classroom between Grades 3 and 4 students learning Chinese as a foreign language at Prasarnmit Primary School International Program (PPiP) in Bangkok, Thailand. Also, this study examined the relationship between the perception of ICT use in the classroom held by these students and their academic achievement in Chinese language class. ICT Use in Learning Chinese Questionnaire, comprised of 13 items using a 5-point Likert scale, was used for measuring the level of perceptions of ICT use in the classroom. Forty-eight students participated in this study, conducted during the academic year 2018-2019. The research findings showed that Grade 3 students held, on average, a moderate perception of ICT use in the classroom in Chinese language class, while Grade 4 students held a positive perception instead. The study also showed that the level of academic achievement of Grade 3 students in Chinese language class was satisfactory, while for Grade 4 students was fairly good. The results showed that there was no significant relationship between perception of ICT use in the classroom and academic achievement of both Grades 3 and 4 students in Chinese language class at PPiP. Also, there was no significant difference in perception of ICT use in the classroom between Grades 3 and 4 students in Chinese language class at PPiP.

Keywords: Chinese as a Foreign Language, Perception of ICT Use in the Classroom, Academic Achievement, Thailand, Primary School.

Introduction

A basic learning content prescribed for the entire Thai basic education is comprised of the languages from neighboring countries. China is one of the neighboring countries of Thailand, so Chinese language is one of the foreign

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languages incorporated in the Basic Education Core Curriculum of Thailand (Ministry of Education, 2008).

The use of technology is one of the bodies of knowledge integrated in the Thai Basic Education Core Curriculum. Thai students are required to master information technology skills, such as using information technology as a bridge to communicate, finding information resources, solving problems and creating value (Ministry of Education, 2008).

Information and Communication Technology (ICT) use in the classroom is one of the requirements for the 21st century teacher. Teachers able to use ICT tools to organize the whole-class interaction and individual work are also able to challenge students' understanding and thinking (Brun & Hinostroza, 2014). Using ICT tools promotes the second language teaching and learning (Drigas & Charami, 2014). In fact, teachers are able to explain the language grammar more clearly and easier to understand by using ICT tools (Drigas & Charami, 2014). Furthermore, teachers able to use online games, which is one way of ICT use in the classroom, can interact with the students and motivate them to practice using the language more (Samuel & Baker, 2006).

Students at Prasarnmit Primary School International Program in Grades 3 and 4 are using Smartboards and iPads when learning Chinese language. The Chinese language teacher is using the online game "Kahoot" for practicing and assessing Chinese reading and Chinese grammar. For Chinese phonics and characters reading, there are Chinese phonics' letters or Chinese characters' displays on the Smartboard with questions. Those questions are related to the pronunciation and meanings of the words and require students to choose the correct answer. For Chinese language grammar, there are several words out-of-order displayed on the Smartboard, requiring from students to correctly order the words to become whole sentences. The students are able to answer the questions by using their own iPads. The game will record how fast students answer and the scores they get. Students are able to know the correct answer after finish one question and also able to know the ranking within their class. Students seem to be motivated to engage in the game competition and also able to improve themselves from the mistakes they made. The researchers believe that students have demonstrated interest in the interaction online game "Kahoot" by using Smartboards and iPads. So, in order to gain a deeper insight on this issue, the researchers designed a study to investigate whether there was a significant relationship between perceived ICT use in the classroom and academic achievement of Grades 3 and 4 students in Chinese language class at Prasarnmit Primary School International Program in Bangkok, Thailand, as

well as to determine if there was a significant difference in perception of ICT use in the classroom held by these students.

Research Objectives

The following were the research objectives developed for this study.

1. To identify the levels of perception of ICT use in the classroom of Grades 3 and 4 students in Chinese language class at Prasarnmit Primary School International Program in Bangkok, Thailand.
2. To identify the levels of academic achievement of Grades 3 and 4 students in Chinese language class at Prasarnmit Primary School International Program in Bangkok, Thailand.
3. To determine if there is a significant relationship between perception of ICT use in the classroom and academic achievement of Grade 3 and 4 students in Chinese language class at Prasarnmit Primary School International Program in Bangkok, Thailand.
4. To determine if there is a significant difference in perception of ICT use in the classroom between Grade 3 and 4 students in Chinese language class at Prasarnmit Primary School International Program in Bangkok, Thailand.

Theoretical Framework

This research was based on the following theories: Computer Assisted Language Learning Theory (Levy & Stockwell, 2006), the socio-educational model (Gardner, 1985) and theory of perceptual learning (Adolph & Kretch, 2015).

Levy and Stockwell's (2006) Computer Assisted Language Learning Theory Little's (1996) computer assisted language learning theory mentions that ICT use can promote the language learning autonomy and freedom. Levy (1997) noted that Computer Assisted Language Learning (CALL) is a kind of teaching approach to facilitate the language learning and teaching using computers (Levy, 1997). The development of computer aided language teaching in language learning theory and technology plays an important role in education. It can enrich the classroom activities and classroom arrangements and provide students with more opportunities to contact with the real-world communication.

Warschauer (1996) reflected on three types of CALL: behavioristic CALL, communicative CALL and integrative CALL.

Behavioristic CALL

Stern describes this stage as auditory linguistics in teaching, psychological behaviorism in psychology, linguistic structuralism. (Delcloque, 2000). This

stage focuses on computer-aided grammar and vocabulary learning through feedback (Delcloque, 2000). At this stage, the application of computer technology is mainly limited to words, structures and simple graphics, which to some extent makes learners lack of interest in learning, so a new era emerges at the historic moment (Delcloque, 2000)

Communicative CALL

The second stage is called communicative computer-aided language teaching. Microcomputers are widely used, which makes it more convenient for users to use computers anywhere (Warschauer & Healey, 1998). The era of communicative computer-aided language teaching is an era of development as well as a turning point. It helps learners get in touch with a real and colorful communication environment. At this stage, the interaction between computer and learner becomes more diversified, and language learning focus on the cognitive perspective. Images, words, sounds and video are applied in the process of language teaching and learning, greatly facilitating learners and stimulating their interest. The development of science and technology enables learners to touch the language in the real language environment of interest, so as to construct their own language system again (Korsvold & Rüschoff, 1997; Warschauer & Meskil, 2000).

Integrative CALL

Compared with communicative computer aided instruction, integrative computer aided instruction is based on the perspective of social cognition of language learning. An English linguist, Michael Halliday, stated that language is not a private affair, but rather a socially constructed phenomenon (Warschauer & Meskil, 2000). Only when language is used for communication in a social context can its meaning be realized. Learners are the most important participants in the process of language learning. They not only master the application of language foundation, but also can apply it in the real communicative environment.

Socio-Educational Model. Gardner's (1985) social-educational model theory points that cultural concepts in social environment affect intelligence, language ability, motivation and situational anxiety in individual differences, and these individual differences directly affect language learning and ultimately lead to differences in learning results. Gardner (1985) pointed out that motivation is the core driving force of second language acquisition, because many factors in language learning depend on learning motivation.

Theory of Perceptual Learning. Perceptual learning is an ability to discover and analyze information through senses (Adolph & Kretch, 2015). We learn

from perceptual experience, that means we keep the information through previous perceptual experiences. We understand the world according to what we see, what we hear and what we touch (Löwel & Singer, 2002).

Conceptual Framework

This study has two types of variables, an independent variable (perceptions of ICT use in the classroom in Chinese language class) and a dependent variable (academic achievement in Chinese language class). The conceptual framework showing how these variables are related is depicted in Figure 1.

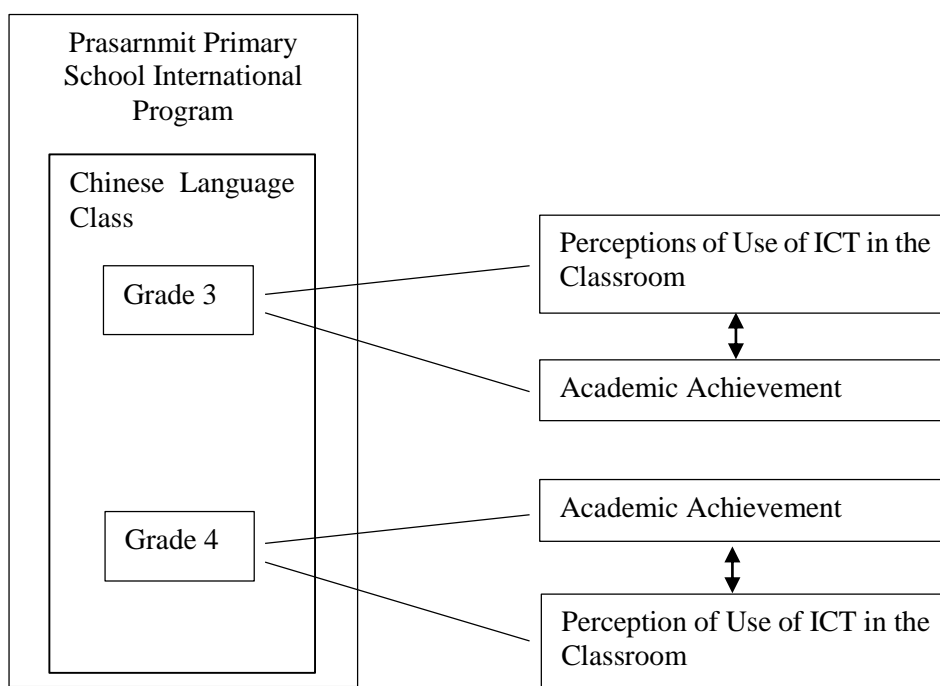


Figure 1. *Conceptual framework for this study.*

Literature Review

A previous research conducted by Alderete and Formichella (2016) examined the effect of ICTs on academic achievement in the Conectar Igualdad Programme in Argentina. The propensity score matching (PSM) method was implemented on 15 years old students to investigate whether ICTs have effect on academic achievement. The research findings showed that there were statistically significant differences in average academic achievement associated with ICT use in this program.

Mafuraga and Moremi (2017) examined the ICT use in the classroom to enhance the English language teaching and learning in junior secondary schools in Botswana. The study showed that ICT use could stimulate the students' interest in learning language and help teachers improve their teaching methods.

Guo, Cao and Wang (2015) investigated the influence of teachers' use of ICT on students' academic achievement in mathematics subject in three school districts in China. They selected three representative districts of the country's 55 junior middle school mathematics teachers and nearly 2,000 students in a two-year follow-up study in 2012. The results showed that teachers' pedagogical use of ICT has a significant effect on students' academic achievement, and it has a greater effect on geometry than algebra. However, the frequent use of information technology in classroom teaching will hinder the development of students' algebra ability.

Ji (2016) examined the effect of ICT academic use on student math academic achievement, especially for female students in Shanghai (China) and Korea. The results showed that ICT academic applications have a positive impact on students' mathematics academic achievement.

Su (2017) investigated the impact of ICT use of students in PISA 2015 (during school, off-campus study, off-campus entertainment) on mathematics academic achievement and indirect impact of student ICT ability level on mathematics academic achievement. The results showed that the use of information and communication technology in school and off-campus leisure activities has a negative impact on mathematics scores.

Ocque (2016) examined the relationship between information and communication technology (ICT) services and students' English language arts (ELA) and mathematics academic achievement, as measured by the New York State ELA and the Grades 4 and 5 mathematics assessments. The results showed that ICT use in general education classrooms has a positive impact on academic achievement for students, especially for those with disabilities.

Methodology/Procedure

Population and sample. The target population of the research was 48 students of Grades 3 and 4 at Prasarnmit Primary School International Program, Bangkok, Thailand, in the academic year 2018-2019. Students of Grade 3 were 19 people and students of Grade 4 were 29 people, totaling 48 people. A population sample was chosen for this study. The main author was the Chinese language teacher for both groups.

Research instrument. There were two instruments used: ICT Use in Learning Chinese Questionnaire and PPiP Chinese Final Test.

ICT Use in Learning Chinese Questionnaire. The questionnaire is a modification of the Opinion About the Use of ICT in Learning Questionnaire, originally designed by Khan et al. (2011). The questionnaire in the study used a 5-point Likert scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*). The questionnaire's items required students to rate how much they like to use the ICT equipment to study Chinese language during the class. There are totally 13 items in this questionnaire. The purpose of current questionnaire was to make it more relevant to the Chinese language learning and perceptions of ICT use in the class at Prasarnmit Primary School International Program, Bangkok, Thailand. Therefore, since in this research "ICT" means "Smartboard", "iPad" and "Kahoot", changes were made to the original questionnaire in order to adapt it to PPiP Chinese language class context.

PPiP Chinese Final Test. PPiP Chinese Final Test was used to measure the levels of academic achievement of Grades 3 and 4 students in Chinese language class at Prasarnmit Primary School International Program in Bangkok, Thailand. The school uses International Primary Curriculum to assess students' academic, the assessment system uses study process level instead of test scores. The test consists of four parts. Part 1 (45 points) consists of 15 multiple choice items worth 3 point each. Part 2 (20 points) consists of 10 matching exercise items worth 2 point each. Part 3 (35 points) consists of 5 interpretive exercise items worth 7 points each.

The collected quantitative data was analyzed by using different statistical methods were used to analyze the data (means, standard deviations, correlational analysis using Pearson's correlation coefficient, and independent samples *t*-test) in order to address this research's objectives.

Findings

In the following sub-sections, the findings regarding each research objective will be summarized.

Research Findings of Objective 1

- ICT use in the classroom of Grade 3 students in Chinese language class at Prasarnmit Primary School International Program, was interpreted on average, as being moderate.

- ICT use in the classroom of Grade 4 students in Chinese language class at Prasarnmit Primary School International Program, was interpreted on average, as being positive.

Research Findings of Objective 2

- The level of Grade 3 students' academic achievement in Chinese language class at Prasarnmit Primary School International Program in Bangkok, Thailand, was interpreted as satisfactory.
- The level of Grade 4 students' academic achievement in Chinese language class at Prasarnmit Primary School International Program in Bangkok, Thailand, was interpreted as fairly good.

Research Findings of Objective 3

- There was no significant relationship between perception of ICT use in the classroom and academic achievement of Grade 3 students in the Chinese language class at Prasarnmit Primary School International Program in Bangkok, Thailand ($r = -.13$, $p = .60$).
- There was no significant relationship between perception of ICT use in the classroom and academic achievement of Grade 4 students in the Chinese language class at Prasarnmit Primary School International Program in Bangkok, Thailand ($r = .24$, $p = .21$).

Research Findings of Objective 4

- There was no significant difference in perception of ICT use in the classroom between Grades 3 and 4 students in Chinese language class at Prasarnmit Primary School International Program, $t(46) = -1.39$; $p = .17$.

Discussion

Based on the findings obtained by this study, this section presents a discussion about the relationship between such findings and those reported by previous research studies.

Perception of ICT Use in the Classroom

ICT includes in Chinese Language Class hardware and software. Hardware devices including, but not limited to, Smartboards and iPads, and software applications including, but not limited to, online games. The teacher used Smartboard to display PowerPoint slides with teaching contents and insert interactive games in the slides. The teacher also used software that support words reading via flashcards, to help students remember the new vocabulary or sentences and review what they have learned in Chinese language class. The ICT skills of Grade 4 students were better than the skills of Grade 3

students, as Grade 4 students have learned Chinese language one more year, using ICT in the class. So, the teacher planned more ICT using activities for Grade 4 students in the classroom. This kind of ICT using activities in the classroom can attract students' attention and also help students practice Chinese in class as much as possible. Language acquisition is about practicing (Mitchell & Myles, 2004). The teacher also used the Smartboard to play relevant Chinese songs or cartoons to encourage students listen to Chinese and speak Chinese for Grade 4 students, since they can understand more complex Chinese in more situations, as they have learned one more year. Practicing the foreign language impact directly on students' foreign language academic achievement (Mitchell & Myles, 2004).

Academic Achievement in Chinese Language Class

Grade 4 students are one year older than Grade 3 students. Age differences is one of the factors that can cause an impact on academic achievement (Wang & Ou, 1996). Age is one of the most obvious and direct non-intellectual factors affecting second language acquisition. The advantage of learning a foreign language is that the brain has the strongest plasticity and there is no difference in language ability for children from 3 years old to 10 years old (which is the age range of Grades 3 and 4 in this study). Being older within this age range has an absolute advantage in acquiring the phonetics of the second language. Language learning during this period may leave traces in the brain, and it is easier to learn later and form language habits. The disadvantage is that the long-term memory is poor, thinking ability is not strong, spend more time. Therefore, they need a better environment to learn a foreign language, such as a bilingual living environment, or good teachers and complete teaching facilities.

Perception of ICT Use in the Classroom and Academic Achievement in Chinese Language Class

The findings of the current study showed that there was no significant correlation between ICT use in the classroom and academic achievement in Chinese language class of Grades 3 and 4 students at Prasarnmit Primary School International Program, which were interpreted as ICT use in the classroom having no effect on academic achievement. This result seemed contrary to the study carried out by Alderete and Formichella (2016), who reported a statistically significant effect on academic achievement and statistically significant differences in average academic achievement associated with ICT use. Our result is also different to the study carried out by Guo, Cao and Wang (2015), which showed that ICT use has a significant effect on students' academic achievement. The findings of Ji (2016) found that ICT academic applications have a positive impact on students' mathematics

academic achievement. Therefore, the findings of Ji (2016) do not align with the findings of the current study. The findings of Ocque (2016) has shown that ICT use in the classrooms has positive impact on academic achievement for students. Therefore, the findings of Ocque (2016) also do not align with the findings of the current study. In addition, according to the study conducted by Su (2017), using data from the Programme for International Student Assessment (PISA) 2015 about ICT use (during school, off-campus study, off-campus entertainment) and its impact on mathematics academic achievement, showed that the use of ICT in school and off-campus leisure activities has a negative impact on mathematics academic achievement. The findings of Su (2017) are then different to the findings of the current study. At the same year, Mafuraga and Moremi (2017) have found out that ICT use could stimulate the students' interest in learning language, while the current study found out ICT use in the classroom is no significant effect on academic achievement. Therefore, the findings of Mafuraga and Moremi (2017) are contrary to the current study.

ICT tools use in the classroom is not a new thing for the students who are learning in Prasarnmit Primary School International Program. The teachers use Smartboard to teach the students from Nursery to Grade 4, to teach almost every subject at this school. Students start to use iPad from Grade 1. Therefore, using ICT tools to learn is the natural things for Grades 3 and 4 students. This is one of the reasons that why ICT using in the classroom is not significant related to the academic achievement in Chinese language class.

There are many non-intellectual factors influencing second language acquisition, which can be summarized as three aspects: learning motivation, learning interest, and personality characteristics (Wang & Ou, 1996). Learning motivation is an important factor in determining the proficiency level of a second language learner (Gardner, 1985). Therefore, teachers should take practical measures to strengthen learners' motivation to acquire a second language. Interest in learning refers to the learner's emotional intention to acquire certain knowledge. Learning interest enables learners to achieve good academic performance even if they are of average intelligence. Students with personality characteristics such as extroversion do better than those who were inward-looking (Wang & Ou, 1996).

Recommendations

Based on the findings of this study, the researchers would like to propose some recommendations to Chinese teachers, people responsible of school curriculum and instruction, and future researchers.

Recommendations for Chinese language teachers

From the research findings and conclusions, the following recommendations are given to Chinese language teachers.

- Chinese teachers could use ICT tools more effectively in Chinese language class.
- Chinese teachers could combine other teaching methods to teach Chinese.
- Chinese teachers could enrich classroom activities without ICT tools.
- Chinese teachers could encourage students to do home-learning exercises.

Recommendations for curriculum and instruction

From the research findings and conclusions, the following recommendations are given on curriculum and instruction.

- Curriculum and instruction could be written in how to use ICT tools more effectively in teaching Chinese language.
- Curriculum and instruction could provide other teachers' teaching by ICT tools experiences sharing comments to guide teacher how to use ICT tools promptly in the classroom.
- Curriculum and instruction could point out the policies of parents' cooperation and build a bridge for the cooperation between teachers and parents.
- Curriculum and instruction could provide methods to organize Chinese activities in school to increase students' chances of using Chinese.

Recommendations for future researchers

From the research findings and conclusions, the following recommendations are given to future researchers.

- Future researchers could increase the number of participating students for obtaining more accurate data.
- Future researchers could expand the range of participate students' grade for obtaining richer data.
- Future researchers could consider using other research instruments related to ICT use in the classroom together.
- Future researchers could explore more teaching factors of improving Chinese academic achievement (e.g., learning motivation, learning interest, personality characteristics).

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